"THE SERVITIZATION OF PRODUCT-ORIENTED COMPANIES"

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TITLE PAGE

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PREFACE

In February 2012, I started my graduation project at BiZZdesign B.V in Enschede. In the beginning it was a little bit messy and noisy at the office, because BiZZdesign moved to the new location in January. After seven months of work, I am glad to present my final report about "The servitization of product-oriented companies". This research became an experience that I did not expected in advance. The short communication lines within the company creates a very pleasant work environment. However, this research was not possible with the expertise of several employees of BiZZdesign and Novay and the supervisors of the University of Twente.

I would like to thank several persons for the support during the research and writing the research. First, I would specially thank my supervisor of BiZZdesign B.V., Henk Jonkers, for his great support, who provided me with useful feedback, relevant information and his common sense. In addition, I would like to thank Henry Franken, Dick Quartel and fellow students for their feedback during the monthly "scrum-meetings" at the office. Furthermore, I would like to thank my fellow students at the office, who contributed to a great time at BiZZdesign. This thesis is also the end of my study period at the University of Twente, therefore also special thanks to my classmates and off course my dad and sister, as supporters and motivators during my study years.

Finally, I would like to thank my supervisors of the University of Twente, M.E. Iacob and C.P. Katsma, for their support, feedback, and scientific advice during the conducting of this master thesis.

Gerben Steunebrink

Enschede, August 2012

MANAGEMENT SUMMARY

The objective of this thesis is to define a method with supporting techniques to guide organizations in making the shift from product-orientation to service-orientation, or a combination of products and services.

Many organizations that traditionally offer (physical) products are currently extending their business to value-adding services. In this context, "*servitization"* means that organizations try to find an optimal combination of products and services to generate income. Like Davies et al (2006); Neely (2009); Vandermerwe and Rada (1988) mentioned, there is clear evidence that manufacturing firms are servitizing, either adding services to or integrating services in their core products.

Roland Berger Consulting (2009) mentioned that the EBIT margin on services is three to seven times higher. Furthermore, Davies, Brady & Hobday (2007) conclude that services provide continuous revenue streams, have higher profit margins and require fewer assets than manufacturing. Despite being a very lucrative strategy, servitization seems to be problematic to implement and the implementation hurdles can even decrease overall financial performance of the firm.

Atos Consulting (2011) mentioned the need of the research about servitization. In their consulting practice they experienced clients that struggle to develop services as a profitable business. The servitization process is not easy, there are a lot of challenges and barriers to overcome, haphazardly conducting this process are doomed to fail. There is evidence that the number of bankruptcies among servitizing companies seems to be higher than average (Atos Consulting, 2011). Therefore, a model-based approach that supports this transition process, will be of great value.

According to the research problem, this research is concerned with answering the following main question:

(MQ). "To what extent can a model-based approach support product-oriented companies to make a transition to a service-oriented company or a combined product- and service oriented company?"

This model-based approach is validated by several experts in the business model field, by a validation workshop and some unstructured interviews. In this workshop the model-based approach is applied on a case. The model-based approach is tested on the case Philips Lighting. Philips Lightning sells no lamps anymore, but sells complete lighting plans. According to the experts in the validation workshop, the overall opinion of the model-based approach was positive. They argued that the approach is a useful approach for product-oriented companies that wants to be more service driven. They emphasized that the customer is very important in the idea-generation step, because they are the potential

customers and they have daily contact with the present product and furthermore the desired product-service system.

The model-based approach depicts an overview of the servitization process in main and detailed steps, at the business model level and enterprise architecture level, complemented with relevant modeling and analysis techniques. Moreover, in addition to the approach a clear overview of the relevant roles, objectives, input, tasks, output and methods/techniques that could be used during the several steps to servitize are suggested.

The common thread in order to be able to deliver services, needs a change of the organization's strategy. The company needs to be become more customer centric (cultural change), finding the right people for the service activities is the key to make such a change successfully.

So, although servitization is an attractive option for product companies, it also raises significant challenges or severe risks.

Keywords: Servitization, service management, service, business models, business model innovation, strategic, enterprise architecture, change management, product companies, service companies.

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CHAPTER 1: INTRODUCTION

This chapter provides an introduction to the phenomenon "servitization". In chapter 3, "Literature study", the concept of servitization is clarified more in depth. Furthermore, this chapter includes a short introduction of the company BIZZdesign, where this research has been performed. At the end of the chapter the structure of the thesis is described, and a research structure model is displayed.

1.1. SERVITIZATION

Many organizations that traditionally offer (physical) products are currently extending their business to value-adding services. In this context, "*servitization"* means that organizations try to find an optimal combination of products and services to generate income. An example of this is the combination of selling a photocopier together with a maintenance contract, paper, software and functionality for document management.

The first acquaintance with this concept in the academic literature was in 1988 by Vandermerwe and Rada. According to Vandermerwe and Rada (1988, pp. 314) more and more corporations throughout the world are adding value to their core corporate offerings through services. The trend is from relevance in almost all industries. Like Davies et al (2006); Neely (2009); Vandermerwe and Rada (1988) mentioned, there is clear evidence that manufacturing firms are servitizing, either adding services to or integrating services in their core products.

However, the service delivery process is not yet as well understood as the traditional product delivery process. Therefore, organizations that are used to delivering products are reluctant to design service delivery processes. Companies struggle with issues such as the actual delivery of services, the management of (possibly multiple) delivery channels, and maintaining a service catalogue. But the extra income that can be generated with service delivery is so high that more and more organizations take this step. According to a survey of the Association of German Equipment Manufacturer (VDMA, 1998), the profit margin of equipment averages at 1%, while services, such as maintenance, installation and process supporting services, averagely provide a profit margin of more than 10% (Gao et all, 2009).

Western economies have started to compete on the basis of value delivered by shifting their market share from manufacturing to more product-service oriented systems (Wise & Baumgartner, 1999; Neely, 2008; Martinez, Bastl, Kingston & Evans, 2010). "Servitization is happening in almost all industries on a global scale. Swept up by the forces of deregulation, technology, globalization and fierce competitive pressure, both service companies and manufacturers are moving more dramatically into services" (Vandermerwe and Rada, 1988, pp. 315). Remarkable is the shift to servitization in China (Neely et al., 2011). In 2007 less than 1% of Chinese manufacturing firms had servitized. By 2011 19,33 % of Chinese manufacturing firms claimed to offer services, see figure 1.

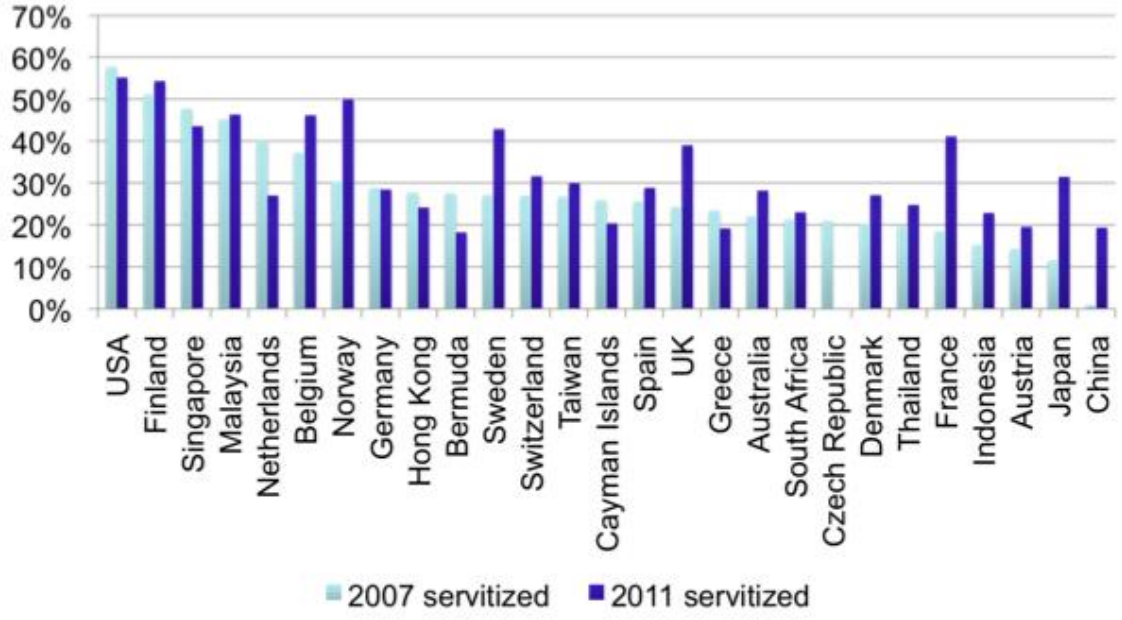


FIGURE 1: SERVITIZATION BY COUNTRY (NEELY ET AL., 2011)

The servitization of manufacturing is currently a hot topic in the academic research. It seems to be difficult for firms and therefore a great challenge to make incremental profits by adding services (Neely, 2009, pp. 105). The adoption to servitize entails significant cultural and corporate challenges. In addition, other challenging barriers are lack of experience to structuring the organization, the fear to absorb risks and changes at the functional and systemic level (Baines et al., 2007; Williams, 2006). So, this research is certainly a contribution to the science.

Concluding, there are several reasons or drivers for manufacturing companies to servitize. There are three types of arguments for this. First, economic arguments. Economic, because substantial revenue can be generated from an installed base of products with a long life cycle (Gao et al., 2009; Knecht, Lezinski & Weber, 1993; Potts, 1988) and services have higher margins than products (Anderson, Fornell & Rust, 1997; Atos Consulting, 2011; Gao et al., 2009; VDMA, 1998). Second, customers are demanding more services. Customers become more and more demanding and organizations get challenged to adjust to those high standards (Atos Consulting, 2011). Finally, the competitive driver. According to Mont (2000); Gebauer et al. (2006) a competitive edge is enhanced as, for example, a service element that is not easy to copy and facilitate, communicates information about the product service-package.

1.2. ABOUT BIZZDESIGN

BIZZdesign is an innovative and leading knowledge organization, continually striving to deliver added value to our customers. The solutions are incentive. Bizzdesign supports open standards and actively participates in The Open Group (TOGAF®, ArchiMate®). BIZZdesign works closely with research centers, universities and market organizations.

Companies and organizations all over the world already benefit from BIZZdesign's tools consultancy and trainings.

Strengths of BiZZdesign are for example managing complexity and change, flexibility and agility faster time-to-market, improving competitive standing. Therefore a slogan of BiZZdesign is: *BiZZdesign makes strategy work!* BiZZdesign has several areas of expertise, also called service lines. For each service line BiZZdesign has integrated solutions consists of user-friendly tools, best practice models and methods, training and consultancy. The service lines include:

- *Enterprise architecture management*

"Enterprise architecture helps managing change and complexity in an organization. Enterprise architecture captures and visualizes the different business and IT domains and their relationships. Enterprise architecture facilitates impact-of change analysis, and helps communication between different stakeholders and departments. Moreover, enterprise architecture facilitates assessing and reducing the cost and risks of change" (Bizzdesign.com).

Some examples of systematic methods used by BIZZdesign are:
TOGAF®: is a structured method providing a stepwise approach to implement and use Enterprise Architecture in an organization. TOGAF is an open standard, maintained by The Open Group.

ArchiMate®*:* an open and independent modeling language for enterprise architecture. ArchiMate provides instruments to support enterprise architects in describing, analyzing and visualizing the relationships among business domains in an unambiguous way. ArchiMate is an open standard, maintained by The Open Group.
Architect*:* is an easy-to-use and powerful tool for enterprise architecture. Architect provides capabilities to model, structure and visualize the enterprise architecture contents in different ways. The underlying repository stores and manages this enterprise architecture information, providing views, queries, reuse, access control and versioning to a variety of different roles and projects.

- *Business requirements management (BRM)*

The BRM approach of BIZZdesign supports companies with:

- Determining relevant stakeholders, their interests, goals and relationships;
- Detecting and solving overlapping and conflicting interests and goals ;
- Translating stakeholders goals to demands for the organization;
- Finding and considering solutions implement these demands;
- Finding 'forgotten' and ' hidden' demands;
- Communicating and validating interests, goals, demands and solutions to involved stakeholders;
- Keeping track of changes (flyer Business Requirements Management).

- *Business process design and improvement*

BiZZdesign uses tools for designing and improving of business processes like the tool

BiZZdesigner.

- *Business process management*

"Business Process Management (BPM) covers the effective and efficient design, implementation, and execution of business processes. BPM contains the integral solutions on the strategic, tactical and operational levels in the organization. Elements of BPM are the different responsibilities in an organization, continuous improvement of processes, and in some cases implementation of process management software (BPM suites)" (bizzdesgin.com).

- *Structured implementation and governance*

To make the right decisions and take the right steps for implementation and governance, BiZZdesign trains, assists and advices in this.

1.3. Research Structure Model

This thesis is chronologically structured, to get a clear view about the research. Chandrasekhar (2002) mentioned that a research must "tell a story clearly and convincingly". Moreover he argues that a "structure of the thesis is designed to enforce logical and scientific rigor and make it easy to read". The approach of this research can be depicted in a research structure model, how the research is structured (Verschuren & Doorewaard, 2007), see figure 2 stated below.

Chapter 1: In the beginning of the first chapter the subject of this thesis is introduced. E.g. a short introduction what servitization actually is, what drives companies to servitize, etc. Furthermore the company BiZZdesign is highlighted, including the products and services they offer.

Chapter 2 In this chapter the research problem and the research question with additional sub questions are discussed and elucidated. Furthermore, the research design including data collection, data analysis and research model is expressed.

Chapter 3: This chapter will be the literature part. The concept servitization is discussed in more depth and is an extension of the introduction part in chapter one. Furthermore, several modeling techniques and methods such as business models and architectural methods are discussed. Models who specify the old and new situation and relevant models for transition are paramount. At the end of the paragraph these models and methods are evaluated.

Chapter 4: In this chapter we discuss a lot of modeling and methods literature and we consider which models and methods are relevant for making a transition to a more service-oriented company. This chapter results in a model-based approach that companies should guide through the aforementioned transition process. Furthermore, several analysis techniques are recommended at each step of the own designed model-based approach.

Chapter 5: In this chapter the model-based approach will be validated. A panel of BiZZdesign and Novay validates the model-based approach during a validation-workshop.

In this workshop the relevant model-based approach is applied on the Philips Lighting case. Moreover, several unstructured conversations has taken place.

Chapter 6: This chapter is the end-part of the thesis. The observations, theoretical and practical implications are discussed. Moreover, recommendations for BiZZdesign are suggested and further research is highlighted in this chapter.

Chapter 7: This chapter comprises the appendices of the thesis. For example the list of abbreviations, invitation of the validation workshop, etc.

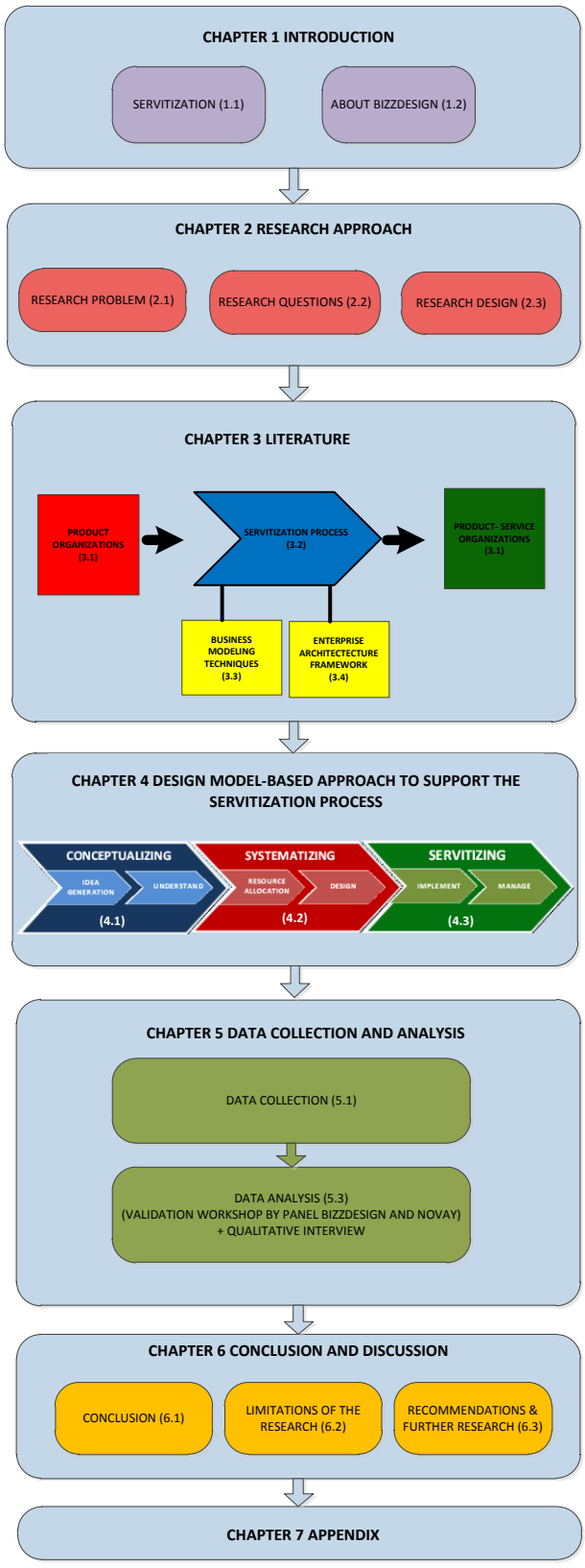


FIGURE 2: RESEARCH STRUCTURE MODEL

CHAPTER 2: RESEARCH APPROACH

This chapter highlights the approach of the research. The importance of the research, the contribution to science and practice, additional research questions and research design are mentioned and clarified. Moreover, the data collection and data analysis are mentioned and clarified. A more extended data analysis is conducted in chapter five.

2.1. RESEARCH PROBLEM

In the literature, "servitization" is a hot topic and described as a way for manufacturing companies to gain more money. The revenue model of integrated products is nowadays moved to the service side. According to a survey of the Association of German Equipment Manufacturer (VDMA, 1998), the profit margin of equipment averages at 1%, while services, such as maintenance, installation and process supporting services, averagely provide a profit margin of more than 10% (Gao et al, 2009).

Neely, Beneditinni & Visnjic (2011) mentioned an interesting fact, the proportion of revenues that manufacturers receive from services has not shifted significantly in the last few years. From a practical perspective one has to ask what is holding back firms from their avowed intents of increasing their service revenues. According to Neely, Beneditinni & Visnjic (2011) people are being more cautious with their money due to the financial crisis and economic uncertainties, this leads to an increase of customers sought to increase life for existing products rather than buying new capital equipment. It seems there is a grey area for companies to make a good understandable transformation to services and to capture and create value through the provision of services, especially in terms of business models. In the literature there is no business model or model-based approach that guides companies in the transition process to a more service-oriented company. Interestingly, academic literature does emphasize the theoretical and practical need of it. Hence, research in this area is of great added value from a theoretical, but also from a practical perspective.

Moreover, there is a contribution to practice. Nowadays products are not simply sold, they enter into long-term contracts and have some influence on the nature and the length of the relationship between supplier and customer changes. It involves a shift from transactional to relational marketing. Briefly, the nature of what is being sold can be changed by the servitization of manufacturing (Neely, 2009). Despite being a very lucrative strategy, servitization seems to be problematic to implement and the implementation hurdles can even decrease overall financial performance of the firm (Visnjic, 2010).

A significant challenge arises for managing and controlling long-term risk and exposure in these partnerships, as well as modeling and understanding their cost and profitability implications (Neely, 2009).

Roland Berger Consulting (2009) mentions that the EBIT margin on services is three to seven times higher. Also, Davies, Brady and Hobday (2007) conclude that services provide

continuous revenue streams, have higher profit margins and require fewer assets than manufacturing. Furthermore, the sales of services as extension of industrial products during the total lifetime of the product, can be 5 to over 20 times higher than that of the initial product (Wise and Baumgarter, 1999; Ren and Gregory, 2007). According to Wise and Baumgartner (1999) the sale of a product accounts for a small portion of overall revenues in many industries. They mention that "providing services to customers is where the real money is". Figure 3 stated below depicts the distribution of revenues in three industries.

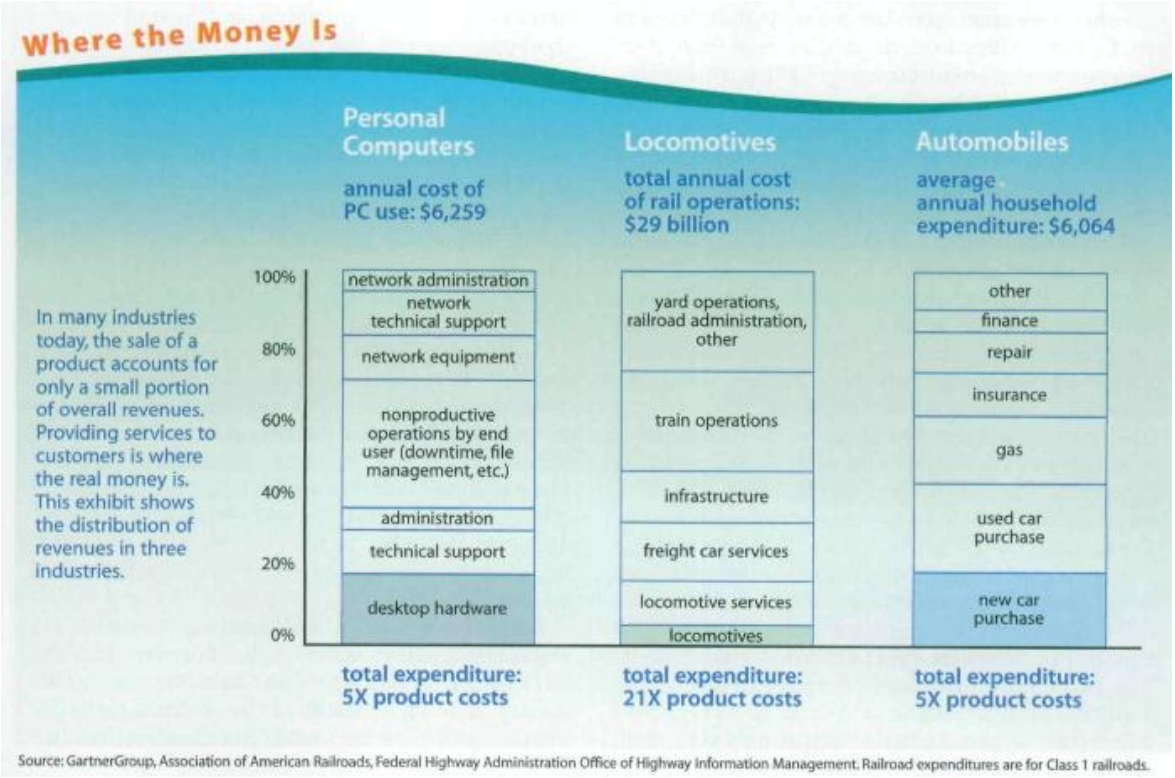


FIGURE 3: WHERE THE MONEY IS (WISE & BAUMGARTNER, 1999, P. 135).

Atos Consulting (2011) mentioned the need of the research about servitization. In their consulting practice they experienced clients that struggle to develop services as a profitable business. The servitization process is not easy, there are a lot of challenges and barriers to overcome, haphazardly conducting this process are doomed to fail. There is evidence that the number of bankruptcies among servitizing companies seems to be higher than average (Atos Consulting, 2011). The added value of this research for BiZZdesign is know-how and a model-based approach, to extend and differentiate their consultancy offerings. BiZZdesign builds stronger organizations, but at this moment they do not give consults to guide companies in the transition process to servitize. Furthermore, organizations are considering servitization, and guidance from a professional with know-how about this transition will be of great added value. And therefore this research contributes to the practice and the R&D of BiZZdesign.

Atos Consulting (2011) did also research at servitized companies about which challenges they are confronted with during the servitization transition. They mentioned that capital goods manufacturers, established in the Netherlands struggle with the need to organize servitization. Therefore an integrated servitization maturity model, that integrates business model and organizational elements, would be of significant value to both practitioners and academics.

The result of this research is a model-based approach that can guide a product-oriented company in the transition to a more service-oriented company. Furthermore, the general model-based approach should be applicable to any product-oriented company who wants to servitize.

Concluding, the objective of this thesis is to define a method with supporting techniques to guide organizations in making the shift from product-orientation to service-orientation, or a combination of products and services.

2.2. RESEARCH QUESTIONS

According to the research problem, this research is concerned with answering the following main question:

(MQ). "To what extent can a model-based approach support product-oriented companies to make a transition to a service-oriented company or a combined product- and service oriented company?"

To give a clear answer to the main question, we have decomposed it into a number of sub questions:

(SQ1). What are the challenges that organizations are confronted with when transforming from being "product-oriented" to being a "servitized" organization?

(SQ2). What modeling techniques are relevant in the context of the challenges that arises in the transformation process?

(SQ3). What types of models are necessary to specify the present and the desired situation?

(SQ4). How can an organization make the transformation to the desired situation?

(SQ5). What are relevant criteria to validate the proposed method according to recent research and/or experts/practitioners?

The model-based approach consists of a method with supporting techniques & tools. It provides a plan of action for product-oriented companies, which considers a transition to a more service-oriented company.

2.3. RESEARCH DESIGN

A research design is a plan and procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Creswell, 2009, p. 3). Creswell (2009) makes a distinction between three types of research designs, qualitative research, quantitative research and mixed method research:

- **Qualitative research** is a means for exploring and understanding the meaning individuals or groups allocate to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. Those who engage in this form of inquiry support a way of looking at research that honors an inductively style, a focus on individual meaning, and the importance of rendering the complexity of a situation;
- **Quantitative research** is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures.
- **Mixed methods research** is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study (Creswell, 2009, p. 4).

The research design of this study is qualitative, because the research involves emerging questions and procedures, data is collected in a participants' setting, inductively structuring from particular to general themes and there are made interpretations of the meaning of the data. At the end, the product of this thesis will be a general model based approach, applicable to any product-oriented company, who is considering to servitize.

The unit of analysis of this research is a transformation process from a product provider to a product-service provider within an organization that designs, builds and delivers integrated product-service offerings.

2.3.1. RESEARCH METHODOLOGIES

Research methodologies (Mertens, 1998), also called strategies of inquiry (Creswell, 2009) or approaches to inquiry (Creswell, 2007) are types of qualitative, quantitative, and mixed methods designs or models that provide specific direction for procedures in a research design.

Creswell (2009, p. 13) makes a distinction between five qualitative strategies: ethnography, grounded theory, case studies, phenomenological research and narrative research. This research consists of a combination of two qualitative strategies, the grounded theory and case studies. **Grounded theory** is a strategy of inquiry in which the researcher derives a general, abstract theory of a process, action, or interaction grounded in the views of

participants. Two primary characteristics of this design are the constant comparison of data with emerging categories and theoretical sampling of different groups to maximize the similarities and the differences of information (Charmaz, 2006; Strauss and Corbin, 1990, 1998). **Case studies** are a strategy of inquiry in which the research explores in depth a program, event, activity, process, or one or more individuals. Cases are bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time (Stake,1995).

The end-product of this research is a model-based approach grounded in the views of participants and the literature, therefore this research contains the grounded theory strategy. The participants validates the model-based approach that guides the servitization process, by means of a validation workshop. In this workshop the model-based approach is applied to a case company that is servitized. Hence, the research contains also the case-studies strategy. So, the qualitative strategy of this research is a combination of grounded theory and case studies.

2.3.2. Data Collection

The data collection steps include setting the boundaries for the study, collecting information through unstructured or semi-structured observations and interviews, documents, and visual materials, as well as establishing the protocol for recording information (Creswell, 2009).

This research collects the information through unstructured observations with my supervisors and people of BiZZdesign, semi-structured interviews and conversations, documents such as scientific articles and a validation workshop. For more detailed information, see chapter five.

2.3.3. Data Analysis

The process of data analysis involves making sense out of text and image data. It involves preparing the data for analysis, conducting different analyses, moving deeper and deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data (Creswell, 2009). In chapter five the collected data is analyzed and clarified more in depth.

2.4. Chapter Conclusion

In chapter 1, the concept servitization was introduced. In this chapter, the concept was highlighted more in depth.

Roland Berger Consulting (2009) mentioned that the EBIT margin on services is three to seven times higher. Also, Davies, Brady and Hobday (2007) conclude that services provide continuous revenue streams, have higher profit margins and require fewer assets than manufacturing. Despite being a very lucrative strategy, servitization seems to be problematic to implement and the implementation hurdles can even decrease overall financial performance of the firm.

Furthermore, organizations consider servitization, and therefore guidance from a professional with the right know-how about this transition will be of great added value. Hence, this research contributes to practice and the R&D of BiZZdesign. According to the research problem, this research is concerned with answering the following main question:

(MQ). "To what extent can a model-based approach support product-oriented companies to make a transition to a service-oriented company or a combined product- and service oriented company?"

To obtain answers on the first four sub questions a literature search is conducted. Besides several companies are qualitative interviewed, using semi-structured open-ended questions and the proposed method will be validated (SQ5). The qualitative strategy of this research is a combination of grounded theory and case studies.

The objective of this thesis is a model-based approach consists of a method with supporting techniques & tools. It provides a plan of action for product-oriented companies, who are considering to make a transition to a more service-oriented company.

CHAPTER 3: LITERATURE

This chapter describes the ingredients out of the literature which forms part of the designed model-based approach what is to come in chapter 4. This chapter is divided in four sections. The chapter starts with an introduction of product-service organizations and highlights the drivers to become more service-oriented (3.1). To become more service-oriented a lot of challenges could arise in this transformation and a structured process should be followed (3.2). In addition, several business modeling techniques and enterprise architecture frameworks provide a useful support. These business modeling techniques provides an interface for the communication between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012). Furthermore, these modeling techniques (3.3) and EA-frameworks (3.4) will be evaluated at the end of the paragraph.

Figure 4 stated below will function as a bookmaker in this chapter, and navigates you through the literature chapter. The colored figure(s) (not colored grey) in the bookmaker figure indicates the section which is discussed. The bookmaker figure is stated in the beginning of each paragraph of this chapter. The four main sections of this chapter are:

- *Product-service organizations who should be designed (the "design object") (3.1);*
- *Servitization transformation process (3.2);*
- *Supporting techniques for business modeling (3.3);*
- *Supporting techniques for EA-design and –modeling (3.4).*

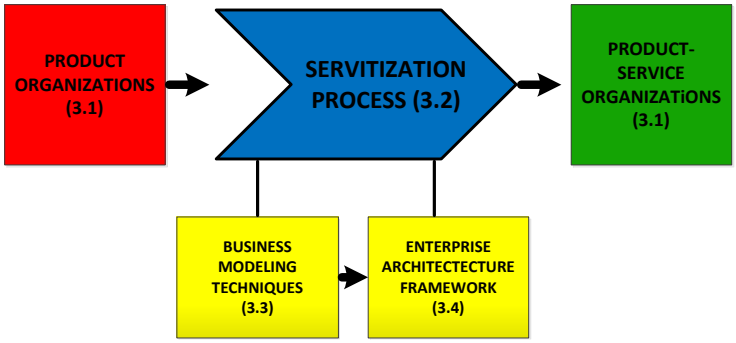
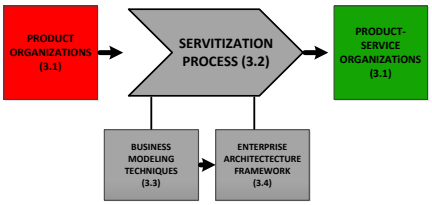


FIGURE 4: BOOKMAKER FIGURE

3.1. PRODUCT-SERVICE ORGANIZATIONS



Due to the development of technologies, many industries were created, in which services and products are integrated because the product means nothing when used separately. For example cell phones, global positioning system, etc (Gao et all, 2009). There is no doubt that customers nowadays demand more services, i.e. complaisance. "They do not want less product, they want the services that will help them make the right decision, to purchase the product when and where they want, to exploit the maximum of this performance and to cope with products defects. Customers are also more likely to make critiques, hence they are harder to satisfy. Customers want everything faster and more comfortable. All this issues are forcing companies to develop servitization" (Jergovic et al., 2011).

Gebauer et al. (2004) argued that on the manufacturer side, the earnings from industrial products become ever less, while services show their potential as an alternative in recent years. Manufacturers should come with some alternatives, and they extend their business around the products to related services, such as personal customization, process support, repair and maintenance, upgrading and recycling, product lifecycle management (Gao et al., 2009). Organizations such as IBM, General Electric, Xerox, Canon have had a significant share of revenues and profits from services since the middle of 1990s; this is attributed to a shift from product to service perspective (Quinn, Doorley and Paquette, 1990; Martinez, Bastl, Kingston & Evans, S. 2010)

IBM is a good example of a successful servitized company. IBM evolved from a near failing hardware business to a very successful solutions company by embracing servitization. See figure 5 stated below, it depicts that the "services" part consists of 53 percent of the total revenue streams.

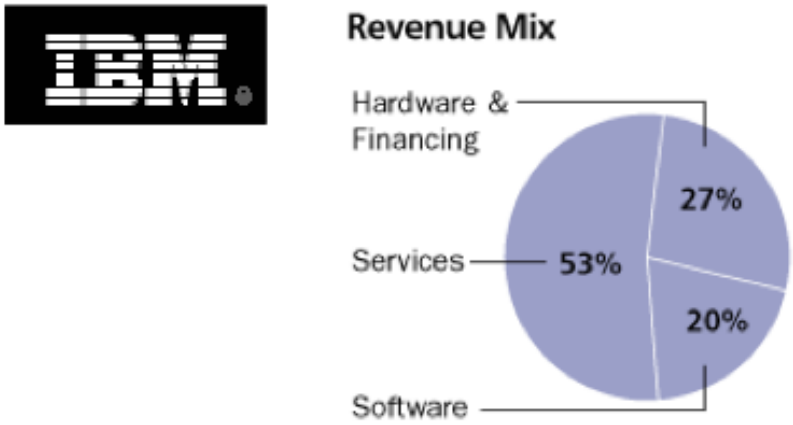


FIGURE 5: IBM REVENUE MIX (IBM.COM)

IBM's transformation is an example to other manufacturing companies as well. Rather than receiving a single payment for initial sales of a manufactured product, many manufacturers are now receiving a recurring stream of revenue for ongoing contracts. To be able to

survive in developed economies it is widely assumed that manufacturing firms can rarely remain purely manufacturing firms. Instead they have to move beyond manufacturing and offer services and solutions, delivered through their products (Atos Consulting, 2011).

3.1.1. SERVICES

The world is becoming characterized by services. The world's most advanced economies are dominated by services, with many having more than 70% of their gross domestic product (GDP) generated by services (Ostrom; Bitner; Brown; Burkhard; Goul, Smith-Daniels; Demirkan & Rabinovich, 2010). According to them is the growth of these services projected to continue undiminished for these countries. "Even countries that have historically focused on manufacturing are experiencing rapid service growth. For example, more than 40% of China's GDP is now attributed to services" (Ostrom et al., 2010, p. 4).

What means service actually? The book of Grönroos (2007): "Service Management and Marketing" is the most cited book in the service management literature. Therefore I assume that the definition of the concept "service" according to Grönroos (2007, p. 52) is of acceptable quality.

"Service" is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.

What types of services exist? Neely et al. (2011) did a longitudinal research (2007, 2009, 2011) at more than 13,000 companies worldwide. Figure 6 illustrates the several types of services offered and gives a view if the profile of services changed significantly. It is still the case that systems and solutions are the most common form of services offered, now followed by design and development, maintenance and support, retail and distribution. Despite they remain by far the most common services offered, but the order of frequency of these four sets of services has changed.

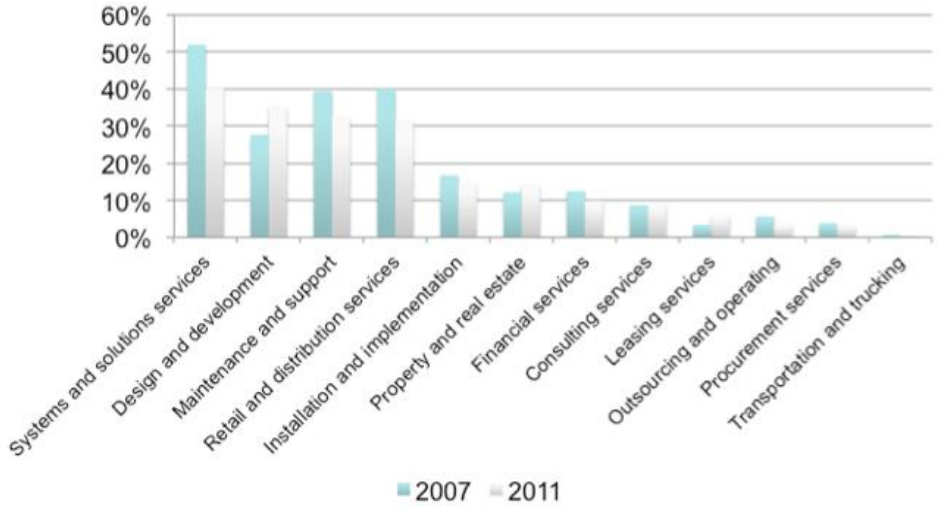


FIGURE 6: THE PROFILE OF SERVICES OFFERED (NEELY ET AL., 2011)

WORKING TOWARDS A DEFINITION OF SERVITIZATION

The notion of "servitization" was first introduced by Vandermerwe & Rada in the late 1980s. They defined "*servitization as a movement in which companies consciously drive their business into services to gain competitive ground".*

This definition is too limited, because they only emphasize one driver of servitization, gaining competitive ground.

Ren & Gregory (2007) defines *servitization specified to the threefold aim of it. Servitization is a transformation process wherein manufacturing companies embrace a service orientation and/or develop more and better services, with the aim to:*
(i) satisfy customer needs;
(i) enhance the firm's performance;
(iii) achieve competitive advantages.

This definition of Ren & Gregory (2007) is more extended than the other definitions. Besides, a threefold aim is mentioned, what gives a enumeration of the drivers of servitization.

According to Neely (2008, p. 10) "*servitization involves the innovation of an organizations capabilities and processes so that is can better create mutual value trough a shift from selling product to selling Product-Service-Systems (PSS)".*

Neely (2008) defined servitization really good, logic and complete. However, it would be better to define servitization as a business model innovation, because something changed to the business model or a new business model is created.

Visnjic (2010, p. 30) used the following definition: "*Servitization is a business model innovation where a manufacturer of products expand the scope of transactions with customers by offering product related services and, hence, more encompassing solutions".*

Visnjic (2010) used the term business model innovation, which we think is correct. When a company is changing their offerings, there is also a change in their business model.

Taking these definitions in consideration, and combine the good things of the definitions of Visjnic (2010) and Ren & Gregory (2007), Neely (2008)), we come up with the following definition:

"Servitization is a business model innovation of organizations processes and capabilities wherein manufacturing companies make a shift from selling product to selling integrated products and services, with the aim to satisfy customer needs, enhance the firm's performance and achieve competitive advantage".

3.1.2. MANUFACTURING AND SERVICE ORGANIZATIONS

Organizations can be divided into two broad categories: manufacturing organizations and service organizations, each posing unique challenges for the operations function. There are two primary distinctions between these categories. First, manufacturing organizations produce physical, tangible goods that can be stored in inventory before they are needed. By contrast, service organizations produce intangible products that cannot be produced ahead of time. Second, in manufacturing organizations most customers have no direct contact with the operation. Customer contact is made through distributors and retailers (Reid & Sanders, 2005).

Reid & Sanders (2005 p. 5) mentioned definitions to depict the difference between manufacturing organizations and service organizations:

"Manufacturing organizations are organizations that primarily produce a tangible product and typically have low customer contact.

Service organizations are organizations that primarily produce an intangible product such as ideas, assistance, or information and typically have high customer contact".

However, the differences between manufacturing and service organizations are not as clear-cut as they might appear, and there is much overlap between them. Because most manufacturers provides services as part of their offering, and many service manufacture physical goods that they deliver to their customers or consume during service delivery (Reid & Sanders, 2005). Figure 7 stated below depicts the differences between manufacturing and services. Pure manufacturing and pure services are shown, as well as the overlap between them.

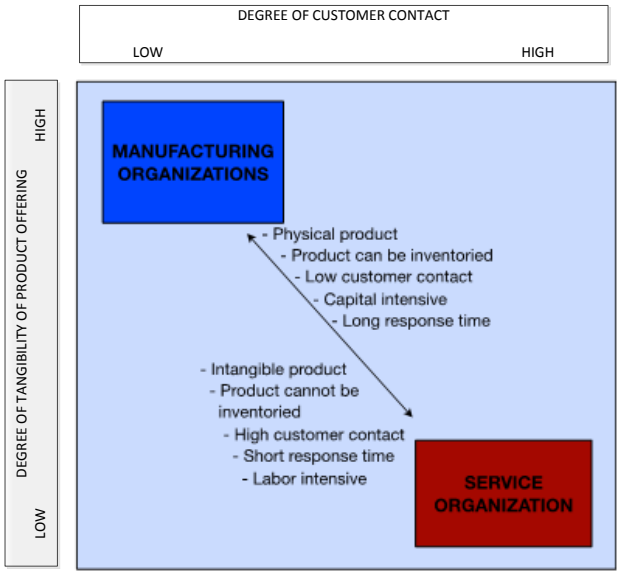


FIGURE 7: CHARACTERISTICS OF MANUFACTURING AND SERVICE ORGANIZATIONS (REID & SANDERS, 2005, P. 6)

3.1.3. PRODUCT-SERVICE SYSTEM (PSS)

The concept of a Product Service System (PSS) is a special case of servitization. "A PSS is an integrated combination of products and services and can be seen as a market proposition that extends the traditional functionality of a product by incorporating additional services" (Baines, Lightfoot, Steve, Neely, Greenough, Peppard, Roy, Shebab, Braganza, Tiwari, Alcock, Angus, Basti, Cousens, Irving, Johnson, Kingston, Lockett, Martinez, Michele, Tranfield, Walton & Wilson, 2007, p. 1). Figure 8 stated below depicts the product-service system, product and service together performs value.

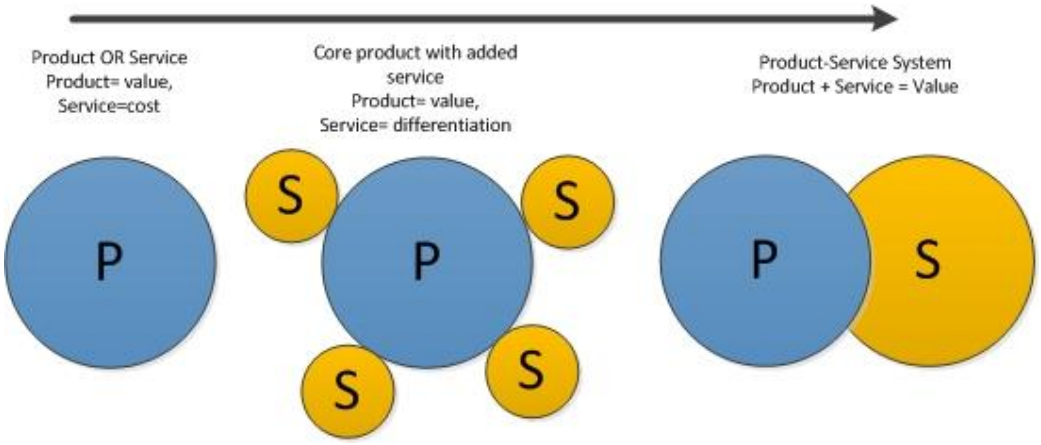


FIGURE 8: THE SERVITIZATION OF MANUFACTURING (BASED ON VANDERMERWE & RADA)

To get a clear view about the concept Product Service Systems (PSS), first some definitions of several authors are revealed. The definition of PSS by Goodkoop et al. (1999) is one of the most cited definitions. According to them, PSS is a system of products, services, networks of players and supporting infrastructure that continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models. Manzini (2003) depicts PSS more as an innovation strategy. He defines PSS as an innovation strategy, shifting the business focus from designing (and selling) physical products only, to designing (and selling) a system of products and services, which are jointly capable of fulfilling specific client demands. These were according to Baines et al. (2007) popular definitions.

According to Morelli (2003) "servitization" can be defined as the evolution of product identity based on material content to a position where the material component is inseparable from the service system. Besides, "productization" can be defined as the evolution of the services component to include a product or a new service component marketed as a product. The convergence of these trends is the consideration of a product and a service as a single offering, a PSS, see figure 9 stated below. This is consistent with Cook et al (2006) and Wong (2004) who mentioned that PSS as fitting into a spectrum where pure products are at one end and pure services at the other.

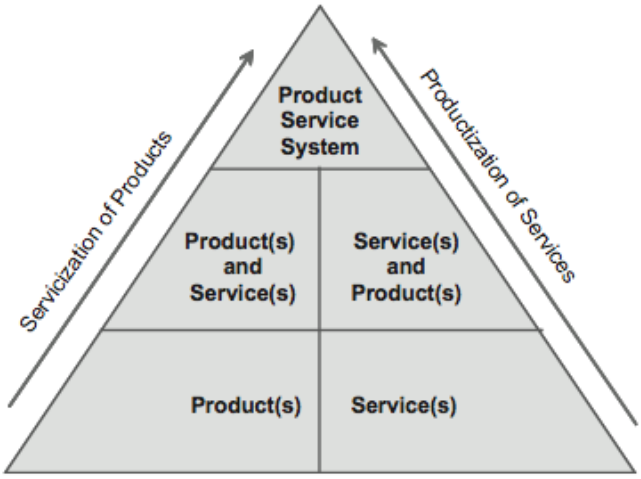


FIGURE 9: EVOLUTION OF THE PRODUCT SERVICE-SYSTEM CONCEPT (MORELLI, 2003, P. 4)

The most authors in the service management literature see the purpose of a PSS as a competitive proposition, and so directly refer to the need for customer satisfaction and economic viability (Baines, 2007). Product-service systems are less easy to replicate, whereas product-based manufacturing and process based manufacturing have proved to be relatively easy to imitate by competitors (Dickson, 1992; Ghemawat, 1986; Martinez, Bastl, Kingston & Evans, 2010).

CLASSIFICATION AND EXAMPLES OF PSS

In the literature several classifications are supposed. Most classifications make a distinction between three categories, see figure 10 stated below(Tukker, 2004; Behrend et al., 2003; Brezet et al., 2001). The first main category is **product-oriented services**. Here, the business model is still mainly geared towards sales of products, but some extra services are added. According to Tukker (2004) there are two different specific types of product-oriented services. First, *product-related service.* In this case, the provider not only sells a product, but also offers services that are needed during the use phase of the product. This can imply, for example, a maintenance contract, a financing scheme or the supply of consumables, but also a take-back agreement when the product reaches its end of life. A second specific type of this category is *advice and consultancy*. Here, in relation to the product sold, the provider gives advice on its most efficient use. This can include, for example, advice on the organizational structure of the team using the product, or optimizing the logistics in a factory where the product is used as a production unit.

The second main category is **use-oriented services.** Here, the traditional product still plays a central role, but the business model is not geared towards selling products. The product stays in ownership with the provider, and is made available in a different form, and sometimes shared by a number of users. According to Tukker (2004) there are three different specific types of use-oriented services. First, *product lease.* Here, the product does not shift in ownership. The provider has ownership, and is also often responsible for

maintenance, repair and control. The lessee pays a regular fee for the use of the product; in this case normally he/she has unlimited and individual access to the leased product. Second, *product renting or sharing.* Here also, the product in general is owned by a provider, who is also responsible for maintenance, repair and control. The user pays for the use of the product. The main difference to product leasing is, however, that the user does not have unlimited and individual access; others can use the product at other times. The same product is sequentially used by different users. Third, *product pooling.* This greatly resembles product renting or sharing. However, here there is a simultaneous use of the product.

The last main category is **result-oriented services**. Here, the client and provider in principle agree on a result, and there is no pre-determined product involved. According to Tukker (2004) there are three different specific types of result-oriented services. First, *activity management/outsourcing*. Here a part of an activity of a company is outsourced to a third party. Typical examples for this type, which include, for example, the outsourcing of catering and office cleaning that is now a commonplace in most companies. Second, *pay per service unit.* This category contains a number of other classical PSS examples. The PSS still has a fairly common product as a basis, but the user no longer buys the product, only the output of the product according to the level of use. Well known examples in this category include the paper-print formulas now adopted by most copier producers. Following this formula, the copier producer takes over all activities that are needed to keep a copying function in an office available (i.e. paper and toner supply, maintenance, repair and replacement of the copier when appropriate).Third, f*unctional result.* Here, the provider agrees with the client the delivery of a result. The provider is, in principle, completely free as to how to deliver the result. Typical examples of this form of PSS are companies who offer to deliver a specified 'pleasant climate' in offices rather than gas or cooling equipment, or companies who promise farmers a maximum harvest loss rather than selling pesticides.

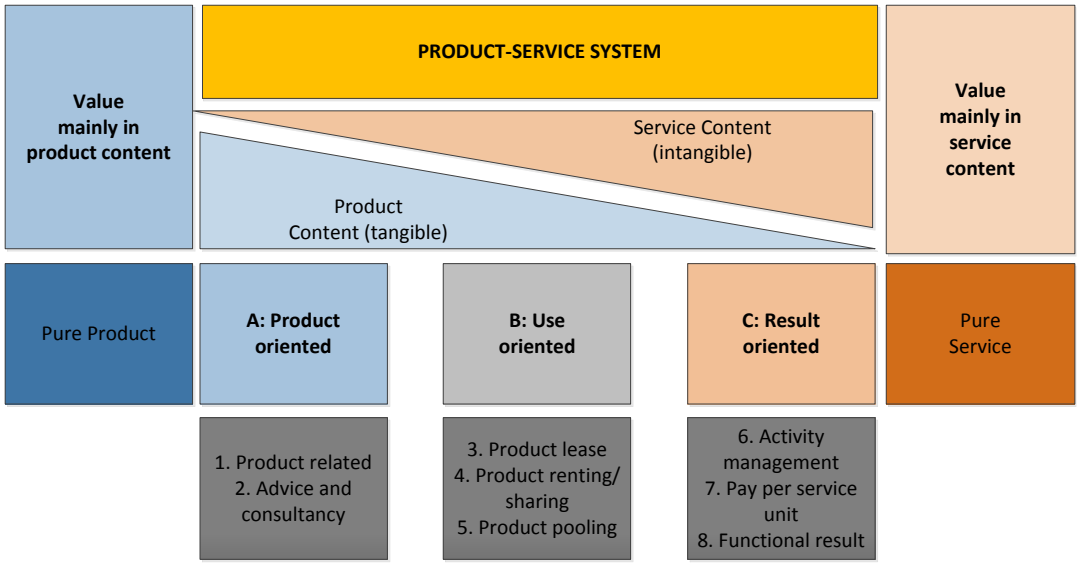


FIGURE 10: MAIN AND SUBCATEGORIES OF PSS (TUKKER ,2004, P. 248)

BENEFITS AND BARRIERS OF PSS

The PSS strategy provides some benefits for the company and the customer (Baines et al, 2007). Looking at the customer perspective, a PSS is providing more value through more customization and higher quality (e.g. improved machine availability for a machine tool within a specific factory context). Besides a fundamental business benefit of a PSS is an improvement in total value for the customers through increasing service elements. According to Mont (2000) a competitive edge is enhanced as, for example, a service element that is not easy to copy and facilitate, communicates information about the product service-package.

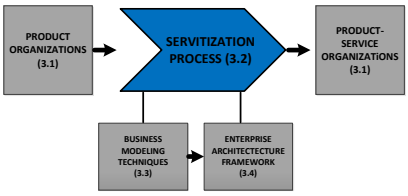
Moreover, the environment also benefits from PSS since a producer becomes more responsible for its products-services through take back, recycling and refurbishment-reducing waste through the product's life (Baines et al, 2007; Mont, 2002).

In addition, successful PSS applications can, through the increase in sales and service activities, offset the loss of jobs in traditional manufacturing. And as public pressure on environmental issues grows, government bodies favor the widespread promotion and adoption of PSS (Baines, 2007; Mont, 2002; Manzini, Vezolli & Clark, 2001).

The adoption of a PSS strategy not only has benefits, there also some barriers to think off. In theory, the implementation of product-service systems (PSS) leads to higher revenues and margins, but in practice, it takes time to build corporate profitability up (Gebauer, Fleisch and Friedli, 2005, Neely, 2008; Martinez, Bastl, Kingston & Evans, 2010). The adoption entails significant cultural and corporate challenges. The main barrier to the adoption of a PSS was by the majority of authors (Baines et al., 2007; Goedkoop, 2000; Mont, 2002; Manzini et al., 2001) the cultural shift necessary.

The organizations that might desire to design, make and deliver a PSS, the significant change in the system of gaining profit could daunt producers from employing the concept. According to Goodkoop et al. (2002) and Baines et al (2007) producers daunt through limited experience in pricing such an offering. Secondly, through fear of absorbing risks that were previously assumed by customers. Thirdly, through lack of experience in structuring an organization to be more complex for a manufacturing organization, than the existing way of delivering functionality through the provision of a product alone. Concluding, this will require changes to be undertaken at the functional and systemic level (Baines et al, 2007; Williams, 2006).

3.2. THE SERVITIZATION PROCESS



Grönroos (2007) mentions that transforming into a service business is one logical way of getting closer to the customers and finding new opportunities to support customers' processes in a more valuable manner than before.

According to Martinez, Bastl, Kingston & Evans (2010) significant literature and theoretical models are available in the general field of strategic organizational change, there are no models that are specific to the issues of servitization as a change process. The literature of strategy and change management mentioned four types of thought for processes of change and Martinez et al. (2010, p. 5) makes a distinction of it:

- "*Planned process:* deciding upon "where we are, where we want to be and how to get there, followed by implementation and monitoring (Greenwood & Hinings, 1993).
- *Emergent processes:* organizations use flexibility to follow incremental changes, in adapting to unpredictable challenges (Quin, 1989; Mintzberg and Walters, 1985; Tranfield and Smith, 1988; Hatum and Pettigrew, 2004; Lindblom and Olkkonen, 2006).
- *Reactive processes:* generally top-down analytical responses to abrupt stimuli (Senge, 1994; Chesley and Wenger, 1999; Weick et al., 2005; Gersick, 1994; Tushman, 1997).
- *Spontaneous processes:* characterized by a proactive "whole system" change, which is unpredictable, uncontrolled, and continuous (Eisenhardt and Brown, 1998; Alvesson, 2004)".

Reinartz & Ulaga (2008) and Martinez, Bastl, Kingston & Evans (2010) mentioned that the adoption of a new product-service strategy requires investments on capacity building such as the acquisition of new peoples' skills, capabilities and technologies, etc. Therefore it might be challenging for organizations to make huge revenues out of a new PSS transformation looking in the shorter term. It may only be at the longer term that a PSS strategy delivers on its promises. (Martinez, Bastl, Kingston & Evans, 2010).

According to the literature, the transformation paths from a product-oriented strategy to a combined product-service strategy are still poorly understood and remain a new and complex concept (Voss, Tsikriktsis, Frohlich, 2002; Johnston, 1995; Miller, Hope, Eisengstat, Foote & Galbraith, 2002; Tukker, 2004; Martinez, Bastl, Kingston & Evans, 2010).

According to Slepniov, Waehrens and Johansen (2010) and Baines et al. (2009) an organization in order to be successful should not only adapt its proposition from product-centric to a product-service system, it also needs to redesign its business model and organization. However, transforming the organization from product-oriented company to a service-oriented company is easier said than done. According to (Atos Consulting, 2011) the transformation takes several steps; adjusting KPI's, redesign processes, management & organization, aligning IT and ultimately people and culture. And therefore it makes it impossible to shift the organization in one go.

The move to servitization obliges companies to deal with three decision making issues: what, how an how much (Almeida et al., 2008). The "what" is strongly focused on the company's mission and its present market positioning. A clear description of the company's mission and an analysis of its present positioning should be capable of defining whether or not there is a misfit between its present situation and the position the company desires. This analysis can include company's positioning in the value chain, company's mission, the level of culture and the nature and value proposal of the offer to customers (Almeida et al, 2008).

The " how much" has to do with the changes needed in the company's offers across all categories. The "how" refers to changes in the organizational and physical structure of the company, its position in the value chain, in its competencies and in the positioning of its services on the market, etc.

Neely et al. (2011) mentioned that the shift to services is viewed by five underlying trends (see figure 11 stated below):

(1). The shift from a world of **products** to a world including **solutions;**
(2). **Output** to **outcomes**;
(3). **Transactions** to **relationships;**
(4). **Suppliers** to **network partners;**
(5). **Elements** to **ecosystems.**

The intention of Neely et al. (2011) is not to suggest that solutions replace product, or network partners replace suppliers, but to emphasize the fact that solutions are supplementing products, network partners are supplementing suppliers. As manufacturers servitize they are expected to provide solutions that complement or support their products. In previous years, the main focus was on customer requirements and satisfying those needs through core business activities. Nowadays, major emphasis is on establishing and maintains relationship between the corporation and its customers through a broad offer (Jergovic, Vucelja, Inic, Petrovic, 2011).

FIGURE 11: DESCRIBING THE SHIFT TO SERVICES (NEELY ET AL., 2011, P. 2)

3.2.1. CHALLENGES OF THE SERVITIZATION PROCESS

Neely (2008) mentioned, in a statistical analysis of 10,000 companies in 25 countries, the paradox of the financial rewards of servitization. Some critical findings are that while the share of product companies that has been servitized is larger than traditional manufacturing firms in terms of sales revenues, at the aggregate level they also generate lower profit as a % of sales. In smaller firms servitization appears to pay off while in larger firms it proves more problematic. Moreover, Gebeauer et al. (2006) mentioned that most companies find it difficult to exploit successfully, the financial potential of an extended service business. The most product manufacturers are confronted with the extended service business leads to increased service offering and higher costs, but not to correspondingly higher returns. They conducted a research among Swiss and German machinery and equipment manufacturing industries and obtained 199 usable responses. Figure 12 stated below depicts, just 11,06 percent of the companies generate more than 40 percent of their revenue through services. More than 35 percent of the companies earn less than 10 percent of revenue through their services.

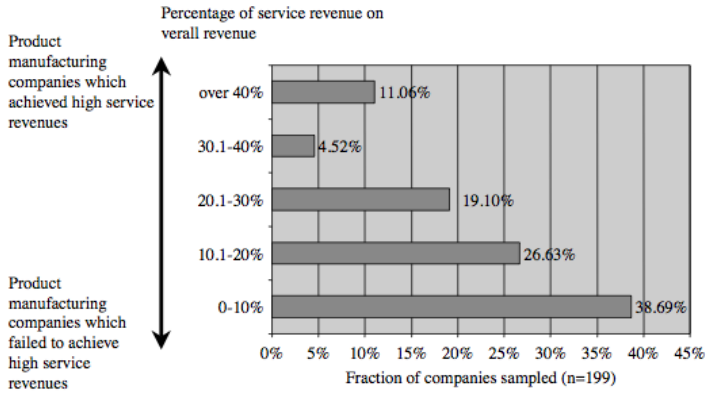


FIGURE 12: SERVICE REVENUES IN MANUFACTURING COMPANIES (GEBAUER ET AL, 2006, P. 375)

According to Martinez, Bastl, Kingston & Evans (2010) there are five categories of challenges that a company has to consider when they make a shift from a product-oriented

organization to product-service oriented company. Their research was based on manufacturing companies in the UK. The five challenges (Martinez et al., 2010) they found were as follows:

(1). Embedded product-service culture

It is important to get everybody involved, to build a service culture, argued by Berry (1995) and Davidow and Uttal (1989). The adoption of a servitization strategy entails significant cultural and corporate challenges. Baines et al.(2007) emphasized an important statement that there is a need for a shift from "product thinking" to "system thinking". The organizational strategy has also to be changed, this sets up specific challenges as the service culture is different from the traditional manufacturing culture. In regard to the long-standing practices and attitudes e.g. the company needs to become more customer centric. Finding the right people for the service activities is the key to making such a change successfully (Atos Consulting, 2010).

(2). Delivery of integrated offering

An integrated offering implies a greater number of customer-touch points, hence a broader range of personnel are being exposed to the customer than previously (Martinez et al., 2010). Besides the product-centric orientation has to be replaced to service-centric.

(3). Internal processes and capabilities

Alignment of processes that are supporting design and changes of product and service is necessary for effective provision of an integrated offering.
In the process of transforming towards provision of an integrated offering, it has become clear that without specific infrastructure an organization will not be able to deliver what has been promised to the end-customer (Martinez et al., 2010). Also metrics that were designed for a "product-centered" organization require re-alignment when organizations transform towards provision of an integrated offering. Baines et al (2009) made clear that in the design of a service provision the communication strategy that clearly describes the value proposition to the customer needs to be considered. Such fundamental changes will not easily be implemented in an organization.

Furthermore, the servitizing company should establish a separate service organization with profit-and-loss responsibility. These new de-centralized service organizations have to function and coordinate with the different set of matrices for measuring performance. The goal achievement should be linked to an incentive system. This makes it clear how individual goals contribute to the overall corporate goal. Every employee in the service organization contributes to a sub goal and thus toward achieving the corporate goal. Motivating employees lead to a direct or indirect employee involvement in defining goals. It is only when employees accept goals, that they are also willing to commit to them. Inappropriate goals lead to demotivated employees who fail to realize their full potential.

(4). Strategic alignment

Strategic alignment is the alignment of mindset and understanding towards service

provision. Therefore it is important that organizations share common language and mindset, to allow a service provider "to think like a customer".

(5). Supplier relationships

"When a company is transforming to become a provider of an integrated offering, a different degree of insight into the problems and applications of customers is necessary, which calls for a greater degree of cooperation between a providers and its supporting network" (Martinez et al., 2010).

Neely et al. (2011) is more specific and extended and made a framework of service complexity. They identified twelve features of service complexity out of literature and case research. They illustrated that there are multiple issues that have to be considered in the design and deployment of complex services. They mentioned that these issues not intended to be homogeneous in nature and encompass different drivers, characteristics and success factors. But they also observe some features that are applicable to complex services and others are specific to those services delivered by manufacturers seeking to add services to complement their products. Perhaps this array of complexity for the servitizing company explains why so many firms find the transition to services challenging. Based on these challenges argued by Neely (2011) and Martinez et al. (2010), I made an overview with key issues that companies should take into consideration, see table 1 stated below.

Category	Key issues
Product extension	Vertical integration: extending the product offering by moving into services that involve moving up or down the value chain; Tighter coupling: Extending the product offering by moving into services that involve closer coupling and integration with the customer.
Embedded product-service culture	Traditional manufacturers have strong technology orientation, which inhibits the transformation toward a service-orientated culture.
Delivery of integrated offering	Product-centric orientation has to be replaced with service-centric; Lack of organizational responsiveness can inhibit provision of integrated offeringw; Multiple touch points are required on interface between provider and customer.
Internal processes and capabilities	Alignment of product and service design processes is required for design of integrated offering and effective response to customer needs; Performance metrics should measure organizations' collective ability in effective and efficient delivery of integrated offering; Manufacturing based metrics are not suitable for measuring product--service provision. Create separate service organization with profit-and-loss responsibility; Social capital capabilities: Developing capabilities that enable relationships and trust to be built with customers.
	Rewards and incentives: Set realistic goals, work with an incentive system and this should contributes to the overall corporate goal; Roles and responsibilities: Being clear about who is responsible for which aspects of service delivery.
Strategic alignment	Absence of internal cooperation, common language and alignment of mindsets slows down transformation efforts.

Supplier relationships	Transactional relationships prevent provider's external network from effectively supporting integrated offering; Changes in the relationships between the product-service provider and its customers are not reflected in the relationships with the provider's suppliers.
Value-in-use	Perceived value: Understanding customer perception of the service received. Service visibility: Ensuring that the service is sufficiently visible so that customers can see the value being delivered (especially important with technologically enabled services)
Risk	Levels of risk: Different complex services expose firms to greater or lesser degrees of risk; Tolerance of risk: Different firms exhibit different abilities to tolerate risk; Forms of risk: There are multiple different forms of risk including: operational risk, partner risk, financial exposure, performance risk, incentive distortion risk, systemic risk and dynamic risk.

TABLE 1: KEY ISSUES IN EACH CATEGORY OF SERVITIZATION CHALLENGES: MARTINEZ, BASTL, KINGSTON & EVANS (2010)

Concluding, while servitization is an attractive option for product companies, it also raises significant challenges.

3.2.2. CSS MODEL OF GRÖNROOS

According to Slepniov, Waehrens and Johansen (2010) and Baines et al. (2009) an organization in order to be successful should not only adapt its proposition from product-centric to a product-service system, it also needs to redesign its business model and organization. However, transforming the organization from product-oriented company to a service-oriented company is easier said than done. According to (Atos Consulting, 2011) the transformation takes several steps; adjusting KPI's, redesign processes, management & organization, aligning IT and ultimately people and culture. And therefore it makes it impossible to shift the organization in one go.

Grönroos (2007) performed a model for developing the new offering, the CSS (Conceptualizing, Systematizing, Servitizing) model. A manufacturer that has adopted a service business logic has to develop its processes, so that they support the corresponding customer processes.

Grönroos (2007) highlights a three-stage approach to develop a new offering with service delivery, in other words to servitize, see figure 13 stated below.

1. **Conceptualizing:**

This stage comprise the decision what kind of support it should provide a customer with, how value should be created in the customer's process, and how customer touch points should be handled and interaction with the customer's various processes should function and what they should lead to in terms of support to the customer's everyday activities and processes, and how this should affect the customer's business process. In fact

conceptualizing includes decisions about what products should be offered and how. Conceptualizing is to determine what to do for the firm's customers.

2. Systematizing

This stage comprises the decision what kind of resources is needed in order to implement the conceptualized offering and create a structural way of implementing the various processes of the offering. Cost-benefit considerations should be taken into account in the systematizing phase. In short systematizing is:

- To determine what resources and processes are needed for the firm to support customers' activities and processes in a value-generating way;
- To organize resources and processes that constitute the offering;
- To coordinate the way various resources and processes function;
- Based on a long-term cost-benefit analysis to determine the limits for flexibility in the way resources and processes function.

3. Servitizing

This is the final phase of the CSS-model. The attitudes, knowledge and skills of people, the capabilities of physical resources, systems and infrastructure to function in a customer-focused way and the customer-focused quality of the leadership provided by managers and supervisors have to be ensured. And sometimes the customers have to be educated about how to participate in the processes. In short, servitizing is to make sure that the planned offering including a set of resources processes, and interaction functions in a value-supporting way, i.e. functions as a service for the firm's customers.

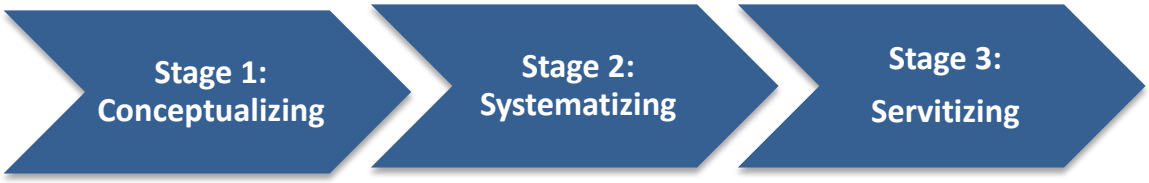


FIGURE 13: CSS-MODEL GRONROOS (P. 447)

The CSS model can often be used in two stages. First, a general conceptualizing, systematizing and servitizing of the offering to customers can be undertaken. The result is an offering that can be used as a general guideline for the business. In the second phase, if and when appropriate, applications geared towards specific customers can be created as guidelines for how a specific customer should be served (Grönroos, 2007).

This CSS model represents a good but too general description of the servitization process, the steps are too big and therefore confusing to use. To design a good model-based approach it would be better to create a more detailed and understandable model, with the roles; objectives; inputs; outputs, activities; methods/techniques recommended at each

step. In paragraph 3.2.2. and 3.2.3. a more detailed roadmap is described. In 3.2.4. an evaluation of the servitization process models is displayed. Moreover, this evaluation will result in a roadmap to servitize what motivates our choice for a particular model and argues why this one is better suited to our needs than the other.

3.2.3. Business model Innovation Process of Osterwalder & Pigneur

For a successful business model innovation process, more guidance is needed, because the supporting methodology for business model generation described in Osterwalder & Pigneur (2009) is very succinct. The business model design process of Osterwalder & Pigneur (2009) consists of five phases: Mobilize, Understand, Design, Implement, and Manage, see figure 14 stated below.

Figure 14: Business model innovation process (Osterwalder & Pigneur, 2009, p. 249)

Mobilize

The objective of this phase is preparing for a successful business model design project (Osterwalder & Pigneur, 2009). First, the relevant stakeholders are mobilized to get them involved in the innovation process, obtain the relevant information about the existing business model and collect requirements for innovation. In the mobilization phase, business goals are established, the exact approach to be followed is selected, and the main requirements are gathered and prioritized.

Understand

The objective of this phase is research and analyze elements needed for the business model design effort.
In existing organizations, the current business model is described using the Business Model Canvas, to make sure that there is a share understanding of the current problem space. This may be done using a staged approach. For example, first the operation of an existing business may be captured in a description of the enterprise architecture; subsequently, part of the business model is derived as an abstracted view of the enterprise architecture. Although, it is still useful to capture the key characteristics of the initial situation: for example, the main characteristics of the environment (potential customer segments, partners, competitors, etc.) and the key resources that are brought in.

Design

The objective of this phase is to generate and test viable business model options, and select the best. The next step is to design a new business model, or more commonly, a number of possible alternative business models. Subsequently, supported by different types of analysis (SWOT analysis, cost-benefit analysis, etc), the most viable business model is selected.

For example, in the case of customer driven business model innovation, a new customer segment will be targeted, this may be lead to required changes in the value proposition, delivery channels, infrastructure, etc.

Implement

The objective of this phase is to implement the business model prototype in the field. Subsequently, the new business model has to be implemented in the organization. Depending on the complexity of change, the business model may first have to be made concrete by means of changes to the enterprise architecture and organization design.

Manage

The objective of this phase is to adapt and modify the business model in response to market reaction. There should be set up management structures to continuously monitor, evaluate, and adapt or transform the business model. The organization will continuously have to monitor for new opportunities (or threats) that may arise at any moment.

3.2.4. Service Innovation Process of Flikkema et al.

Flikkema, Spaargaren & Kwakman (2010) argue that the service innovation process consists of seven steps, see figure 15 stated below:

FIGURE 15: SERVICE INNOVATION PROCESS (FLIKKEMA ET AL., 2010)

Idea generation

Idea generation is closely related to creativity and is paired with "out of the box thinking". Idea generation refers to the process in which people know where to look for and why, which in time can be collectively executed. Ideas emerge from the variety and diversity of experience and behaviors that are to be found across a firm and its surroundings, on all levels (Johnson & Scholes, 2002). It might be interesting to involve employees with different experiences, because they interpret situations in unique ways and might come up with different ideas for a particular situation. The greater the variety of experiences, the higher chance on innovation (Johnson & Scholes, 2002).

Decision making

The more likely the decision are made at the top level, the more centralized a firm is. At the strategic action level, selection mechanisms refer to planning, budget and evaluation issues (Johnson & Scholes, 2002). At the level of strategic choices, selections are often based on the attractiveness of an idea. These reasons could be rational, analytical demonstrated or due to more subjective reasons. In these cases it is important to gain initial support from for example a manager acting as a champion of the potential innovation (Flikkema, 2008).

Resource allocation

In this phase it is important to allocate the resources. So, what kind of resources and processes are needed for the firm to support customer's activities and processes in a value

generating way? According to Flikkema (2008) resource allocation mainly concentrates on the financial sources available. Financial resources consist partly on innovation budgets as present on the firms' budget plan. Also customers are important resources, and in a business to consumer environment mostly in the form of time invested (participated) in the innovation. According to Eisenhardt & Brown (1995) resource allocation the indication of which components are suitable for product- but also service innovation as well. The main logics behind this are process performance, product affectivity and financial success.

Design/development

During the design and development stage, commercial and technical feasibility of the innovation need to be investigated, most of the time these investigations are summarized in a business case (Ernst, 2002). Moreover, these outcomes of the business case create useful insights for decision-making. Project team members are the people who transform vague ideas, concepts and product or service specifications into the design of new products of service.

Test/pilot

Before a service is available on the market, it is necessary to design a test phase (Kotler & Keller, 2007). Testing involves presenting the designed service innovation to a couple of customers in the pre developed target market and to evaluate their experiences. Service firms need to evaluate the proposed new innovation on defined targets like sales forecasts, costs, profit projections, etc. The innovation is ready for market launch, when these projections satisfy the innovation's objectives.

Launch

The actual launch stage of the service innovation is of great importance (Flikkema, 2008). In order to get a successful launch of the innovation, training of service employees and internal marketing are important management responsibilities (Grönroos, 2000). Multiple actors take part, during the service launch. External marketing refers to the more traditional marketing elements like pricing, distribution channels, advertisement campaigns, etc. Internal marketing, is highly related to customer contact and training and motivating service employees to service customer in an appropriate way is essential. Every service employee act as part-time marketer in the service delivery process and should be properly skilled (Grönroos, 2000; Kotler & Keller, 2007 in Flikkema, 2008).

Evaluation

The innovation should be evaluated another time. Service firms need to evaluate the proposed new innovation on defined targets like sales forecasts, costs, profit projections, etc. Do the desired results corresponds to the perceived results? Should there be a reconsideration of the business model?

3.2.5. EVALUATION SERVITIZATION PROCESS MODELS

In this subparagraph we evaluate the servitization process models, that have been discussed before in this paragraph. The best elements out of these existing process models

are combined to provide a new own servitization process model. The relevant process models are depicted in figure 16 stated below.

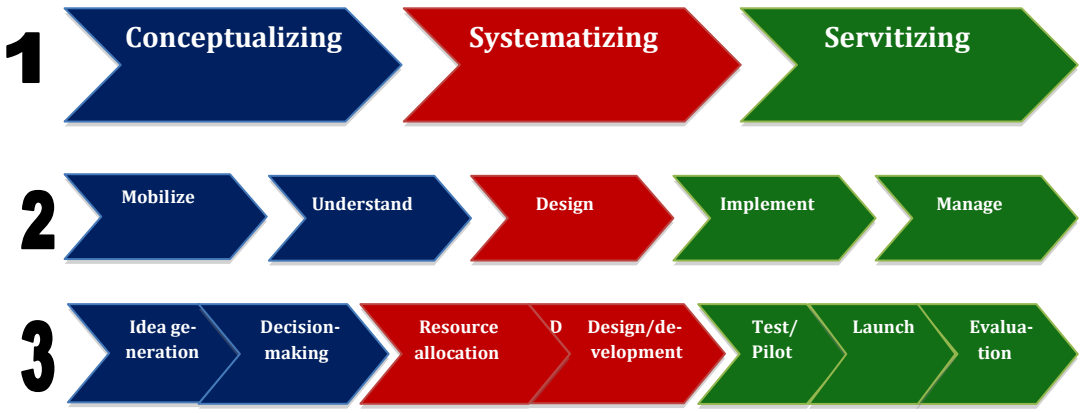


FIGURE 16: SERVITIZATION PROCESSES (1: CSS-MODEL, GRÖNROOS (2007); 2: BUSINESS MODEL INNOVATION PROCESS, OSTERWALDER & PIGNEUR, 2009; 3: SERVICE INNOVATION PROCESS STEPS, FLIKKEMA ET AL., 2010)

The first process, the CSS-model of Grönroos (2007), can be divided into more detailed process steps. The second sequence of process steps, the business model innovation process described in Osterwalder & Pigneur (2009), shows a more detailed view of the three process steps of Grönroos. The third figure of (Flikkema et al., 2010) depicts an even more detailed process. The color in the figures correspondence between of the process steps, in the three servitization process models. In this paragraph, these models are combined and perform the common theme of the model-based approach.

However, which detail-steps of main-process two and three are the best/ logical/easy to understand steps to guide the servitization process. Each step has its own aspects to think of, and/or use models to give insight into the situation to finish the concerning step, and to continue to the next step. The CSS model is the leading process model, divided in more detailed steps, of the model-based approach.

The servitization process is according to me characterized as follows:

Osterwalder & Pigneur (2009) starts with the "mobilize phase", but the step "idea generation" of Flikkema et al. (2010) better represents what actually should happen during the starting phase. Content-wise, the phases "mobilize" and "idea generation" are largely the same.

The second step is the "understand" step (conceptualizing phase). The objective of this step is to research and analyze elements needed for the business model design effort. The second step of Flikkema et al. (2010) "decision making" is only about "decision making and selection schemes", and the question of who is responsible for making decisions, instead of to making sure that there is a shared "understanding" of the current problem space. A shared understanding is of critical value, because the roles who should participate in this step will be divergent. The roles who should participate in this step is described in the next

chapter. Understanding which are key characteristics of the initial situation, for example the main characteristics of the environment (potential CS, KP, competitors) is an important aspect in the early phases of the servitization process. Therefore, we include the "understand" step in our process, rather than a "decision-making" step.

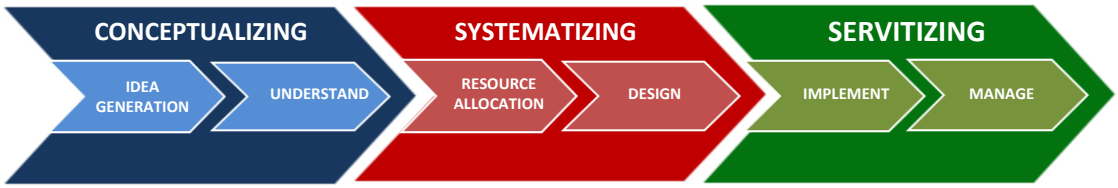
The third step is the "resource allocation" (systematizing phase) step of Flikkema (2008). In the previous "understand" step, Osterwalder & Pigneur (2010) also highlight the key resources. In contrast with Osterwalder & Pigneur(2010), Flikkema et al. (2010) distinguish it as a separate step, which emphasizes the allocation of resources. For example, what kind of resources and process are needed for the firm to implement the new business model (e.g. financial resources, customers, personnel, etc.). Because this "understand"-step (second step) is a relatively big step, I choose separate this step in a "understand"- step and a "resource allocation"- step.

The fourth step is the "design" step (systematizing phase), and is both recommended by Osterwalder & Pigneur (2010) and Flikkema et al. (2008) as the next step. And therefore I also us this step in my process model. In this step the viable business models are generated and tested, and the best one will be selected.

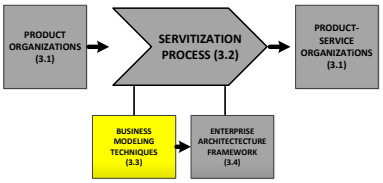
The fifth step is the "implement" step (servitizing phase), and is also both recommended by Osterwalder & Pigneur (2010) and Flikkema et al. (2008) as the next step. In this step the objective is to implement the business model prototype in the field.

The sixth step is "manage" (servitizing phase), and is mentioned by Osterwalder & Pigneur (2010) as the next step. This "manage" step consists of monitoring, evaluating and adapting or transforming the business model. These aspects are not clearly described by Flikkema et al. (2008), they only discussed the "evaluation" step, but there is more than that (e.g. monitor, adapt) .

Therefore I will recommend the following process steps to servitize:



3.3. Business Modeling Techniques



General literature on business strategy and business models suggest that a firm's products and services, markets and customers, technology, capabilities, value proposition and

revenue creation logic, or past performance and industry characteristics are factors to be discussed in the choice of a business model (Chesbrough and Rosenbloom, 2002; Kujala, Kujala, Turkalainen, Arrto, Aaltonen, Wikström , 2011). The discussion of business models is usually strategy-related and subsequently take place at the organizational level (Hedman and Kalling, 2003; Siggelkow, 2001; Kujala et al., 2011). While servitization undoubtedly offers a lot of opportunities, we find that the choice of the business model as well as the implementation practices have a decisive effect on the success of this strategy (Visnjic, 2010). According to Teece (2010) is the essence of a business model defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and coverts those payments to profit. Furthermore, Spring and Araujo (2009) arguing that the concept of a business model is a useful framework for considering services. Osterwalder & Pigneur (2010) defines a business model as a model that describes the rational of how an organization, creates, deliver, and capture value.

3.3.1. *Business Model Canvas*

According to Osterwalder & Pigneur (2010) the Business Model Canvas is a well-defined concept that allows the company easily to describe and manipulate business models to create new strategic alternatives. This concept is applied and tested in organizations all over the world, such as IBM, Deloitte, Ericsson, and many more. They argued that without such a shared language it is difficult to systematically challenge assumptions about one's business model and innovate successfully. The Business Model Canvas comprises of nine basic building blocks that shows the logic of how a company intends to make money. The nine blocks cover the four main areas of a business: customers, offer, infrastructure, and financial viability. Figure 17 stated below depicts a clear overview. Furthermore, the business model is like a blueprint for a strategy to be implemented through organizational structures, processes and systems.

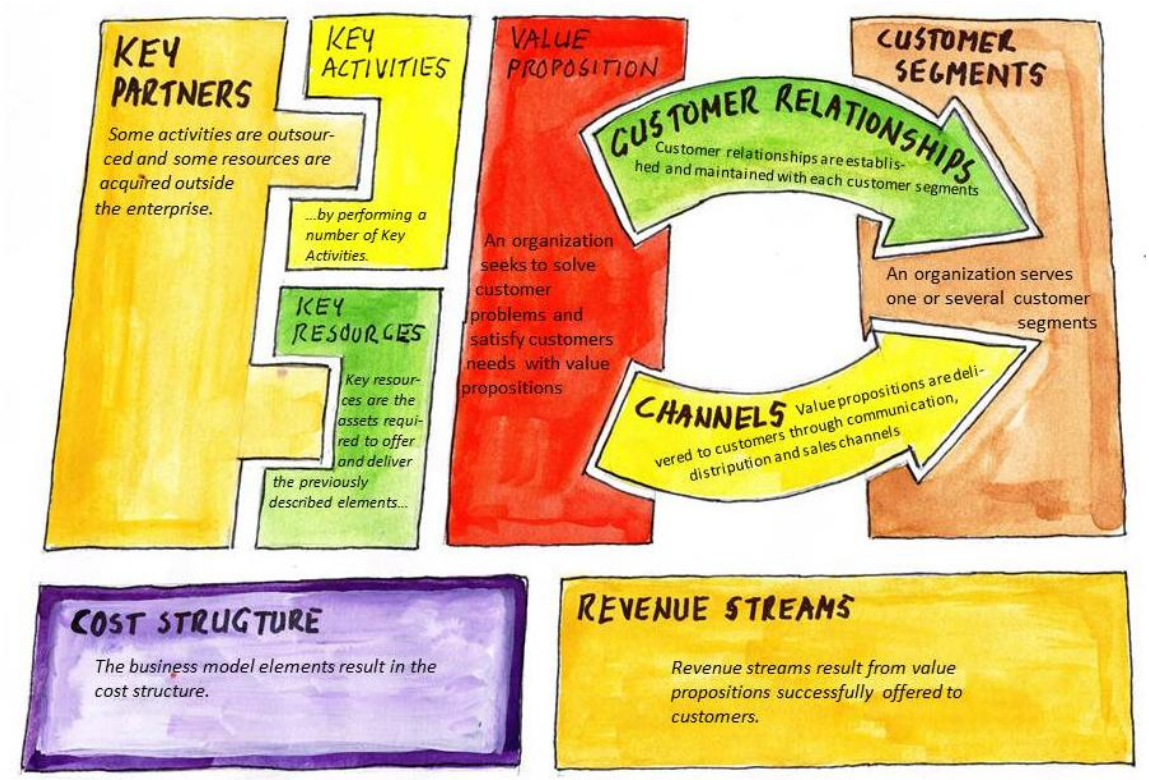


FIGURE 17: BUSINESS MODEL CANVAS (OSTERWALDER & PIGNEUR, 2009) SOURCE FIGURE: OSHANASSYPROJECTS.COM

To give a clear overview about this CANVAS business model, the nine building blocks are explained and elaborate in more depth (Osterwalder & Pigneur, 2010, 20-40):

Customer Segments (CS)

The Customer Segments building block defines the different groups of people or organizations an enterprise aims to reach and serve.

Value Proposition (VP)

The Value Propositions building block describes the bundle of products and services that create value for a specific customer segment.

Channels (CH)

The Channels building block describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition.

Customer Relationships (CR)

The Customer Relationships building block describes the types of relationships a company establishes with specific Customer Segments.

Revenue Streams (RS)

The Revenue Streams building block represents the cash a company generates from each Customer Segment (cost must be subtracted from revenues to create earnings.

Key Resources (KR)

The Key Resources building block describes the most important assets required to make a business model work.

Key Activities (KA)

The Key Activities building block describes the most important things a company must do to make its business model work.

Key Partnerships (KP)

The Key Partnerships building block describes the network of suppliers and partners that make the business model work.

Cost Structure (CS)

The Cost Structure describes all cost incurred to operate a business model.

3.3.2. STOF

The STOF method offers a step-by-step approach creating a balanced design of business models. The model is the product of a four-year during FRUX-research, where many people contributed to the method and its concepts and purpose (Faber, de Vos, Haaker & Bouwman, 2008).

The STOF model makes a distinction in the business models from four interrelated perspectives or domains: Service, Technology, Organization and Finance (Faber, de Vos, Haaker & Bouwman, 2008). They argued that the starting point for any business model is the customer value of a product or service that an individual company or network of companies has to offer and the specific demands it is designed to meet. They start from the service and focusing on the value proposition.

"**Service domain**: a description of the service offering, its value proposition (added value of the service offering) and the market segment at which the offering is targeted

Technology domain: a description of the technical functionality required to realize the service offering.

Organization domain: a description of the structure of the multi-actor value required to create and provide the service offering and describe the focal firm's position within the value network.

Finance domain: a description of the way a value network intends to generate revenues from a particular service offering and of the way risk, investments and revenues are divide among various actors in a value network" (Faber et al., 2008, p. 17).

Faber et al. (2008) mentioned when these domains are properly designed and balanced, it constitutes a business model that generates value for customers as well as the provisioning network. Figure 18 stated below depicts a clear overview of the STOF-model.

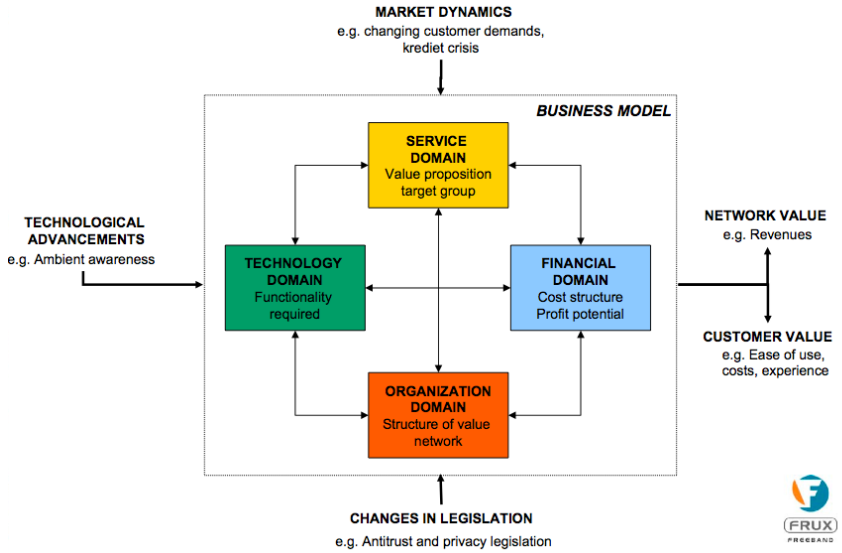


FIGURE 18: STOF BUSINESS MODEL FRAMEWORK (FABER ET AL., 2008)

These business domains in the STOF-model are outlined as static in nature. However, they are dynamic in nature and involve design choices that have to be adapted over time in order to maintain a fit with the environment. Besides, changes in one component of the business model may require other components to be modified to maintain an internal fit.

3.3.3. E3-VALUE

E3 value is an interdisciplinary approach to explore an innovative commerce idea thoroughly and evaluating it for potential profitability (Gordijn & Akkermans, 2003). The e3-value method is based on economic value-oriented ontology that specifies what an e-business model is made of (Gordijn & Akkermans, 2001). In particular, it entails defining, deriving, and analyzing multi-enterprise relationships, e-business scenarios, and operations requirements in both qualitative and quantitative ways. Who is offering what (value objects), to whom and what to get in return. The e3-value approach depicts an economic value perspective in a model-based way and focus on value-adding activities. Besides, it is strongly connected to the business model. However, it is less detailed in operational scenarios (e.g. no insight into unnecessary actions). In figure 19 stated below, a simplified model depicts the value of Amazon.

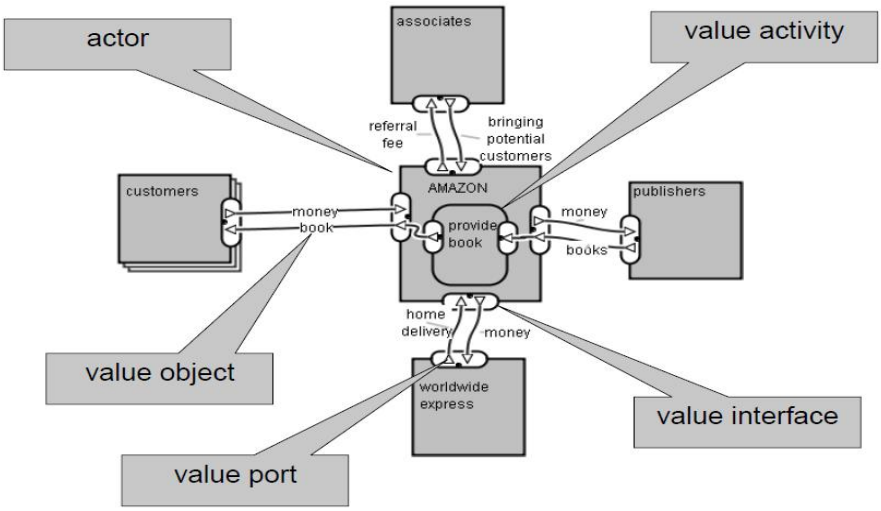


FIGURE 19: E3-VALUE (GORDIJN & AKKERMANS, 2003)

3.3.4. EVALUATION BUSINESS MODELING TECHNIQUES

In this chapter three business modeling techniques have been discussed. In this section, we evaluate these techniques. This motivates our choice for a particular model, and argues why this one is better suited to our needs than the other. Moreover, which evaluation criteria should we consider important to these models, particular in the case of servitization.

The choice of the business model which we are going to use in the model based approach, is the Business Model Canvas. There are several reasons for choosing this technique. See table 2 below, these + and – gives a rating on several aspects, which can be assumed as an evaluation (Bouwman, de Vos, Haaker, 2008; blog of Blom, 2012; Barquet, Cunha, Oliveira, Rozenfield, 2011).

The "ease of use" aspect is a very important criterion in the case of servitization, because several roles in the company and the customers will participate in the servitization process. For example not only the managers should understand this Canvas, but also the customers and work floor employees. Besides, the criterion "material look and feel" is therefore also an important criterion, everybody should be able to understand and to work with the Canvas. The Business Model Canvas is very easy to understand and easy to explain to others. The people get excited and can almost start instantly. Besides it is a hands-on tool that fosters understanding, discussion, creativity, and analysis (Bouwman, de Vos, Haaker, 2008; blog of Blom, 2012; Barquet, Cunha, Oliveira, Rozenfield, 2011).

It is always useful and easy to have a good availability of information about the techniques that you use during the servitization process, so that you can check the material everywhere at any time at any place. The Business Model Canvas is very well described in several books (e.g. "*Business Model Generation*" van Osterwalder & Pigneur (2010)) and on

websites, therefore the availability of the material is great and scores great on the criterion "support".

Furthermore, servitization is a business model innovation (Visjnic,201). Therefore, it will be of great necessity that the business model technique scores well on the criterion "focus on innovation". Also on this criterion the Busines Model Canvas scores ++.

However, the Canvas scores - - for the criterion "methodology support". Nevertheless, this is not an issue. In our model-based approach we provide some additional methodological support to fill up this gap. For example, the Canvas not includes a scan of the existing competition or a scan of the macro environment. To convert this disadvantage in an opportunity, other models are included, such as Porter's Five Forces and PESTEL.

Another aspect what is missing in Business Model Canvas and e3-value (both score - -) is the implementation part, there is no attention to the organizational structure and technical aspects that are going to change. The changed business model, has certainly some impact on the organization structure and the architecture (Davies et al., 2006). According to Neely the servitization process however considered to be difficult, and may even risk the survival of the firm (Neely, 2009), for it ultimately involves a switch from 'making products' to 'providing service'. This requires a shift from a 'goods dominant logic' and mindset, to a 'service dominant logic' and mindset, and associated changes in organizational architecture and the business model (Normann & Ramirez, 1993; Vargo and Lusch, 2004). Therefore a good implementation of our business model and architecture is key. In our model-based approach this missing "architecture" part will be filled up with the TOGAF ADM process. The TOGAF ADM process will support this implementation part. Organizations need a complete approach to guide the development of enterprise architecture, from strategy and requirements to implementation and governance (Iacob, Jonkers, Quartel, Franken & van den Berg, 2012). In the next paragraph TOGAF is described more in depth.

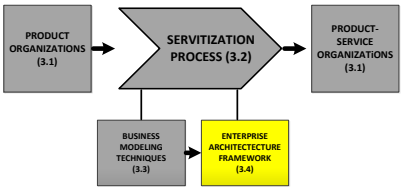
Evaluation Criteria	CANVAS	STOF	E3-value
Market presence	++	--	--
Support	++	+	--
Focus on implementation (organization/technical aspects)	--	++	--
Methodology support	--	++	+
Ease of use	++	-	--
Acadamic foundation	++	++	++
Material look/feel	++	-	--
Focus on innovation (workshops)	++	+	+

TABLE 2: EVALUATION OF BUSINESS MODELS (BOUWMAN, DE VOS, HAAKER, 2008; BLOG OF BLOM, 2012; BARQUET, CUNHA, OLIVEIRA, ROZENFIELD, 2011)

Concluding, the Business Model Canvas scores at the relevant criteria in the special case of servitization ("focus on innovation", "ease of use", "material look/feel" and "support") the best. However, the Canvas scores at the criterion "focus on implementation" and

"methodology support" -- and are also very important criteria, but these criteria are substituted by other additional suited techniques, which are highlighted in chapter four. Therefore, we chose the Business Model Canvas as our business modeling technique in our model-based approach.

3.4. Enterprise Architecture Frameworks



Enterprise Architecture (EA) descriptions are formal descriptions of an information system, organized in a way that supports reasoning about the structural and behavioral properties of the system and its evolution. It enables to manage the overall IT investment in a way that meets the needs of your business (Archimate® 2.0 specification, 2012). A definition of enterprise architecture is "a coherent set of descriptions, covering a regulations-oriented, design oriented and patterns-oriented perspective on an enterprise, which provides indicators and controls that enable the informed governance of the enterprise's evolution and success" (Land, Proper, Waage, Cloo & Steghuis, 2009). Enterprise architecture can help organizations and their transformation processes in successfully executing their strategy. According to Iacob, Meertens, Jonkers, Quartel, Nieuwenhuis & van Sinderen (2012) EA can be related to business models. It becomes possible to assess, at strategic level, the global balance between costs involved in the architecture change and the benefits one may expect from it. Furthermore, the architecture change can be mirrored by a business model change, and thus the impact of the architecture change for the business becomes explicit.

3.4.1. Enterprise Architecture Methods

There are several enterprise architecture methods, for example TOGAF, DYA and ZACHMAN. Each method or framework has its own advantages and disadvantages. At the end of the paragraph these methods are evaluated. This results in a choice of the type EA method, what is best suited as EA modeling technique in my model-based approach.

TOGAF

TOGAF is an Enterprise Framework of The Open Group that is considered by practitioners as an interesting framework in the context of enterprise architecture (Buckl, Ernst, Matthes, Ramacher & Schweda, 2009). TOGAF is a tool for assisting in the acceptance, production, use and maintenance of architectures. The first version of TOGAF, developed in 1995, was based on the US Department of Defense Technical Architecture Framework for Information Management (TAFIM). TOGAF 9 was first published in January 2009 (The Open Group, 2009).

TOGAF reflects the structure and content of an architecture capability within an enterprise, as depicted in figure 20 stated below.

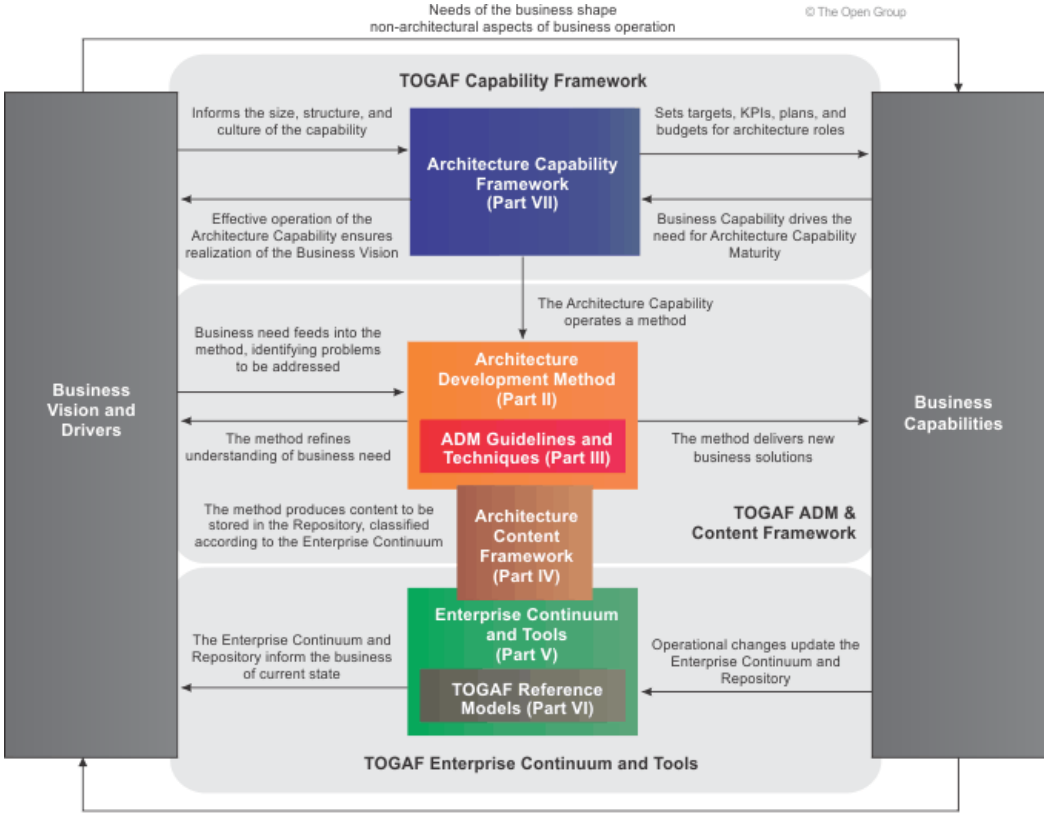


FIGURE 20: TOGAF CONTENT OVERVIEW, SOURCE: OPENGROUP.COM)

The core of TOGAF is formed by the Architecture Development Method (ADM), a step-wise, iterative process for the development and implementation of an enterprise architecture, see figure 21 stated below. Architecture Development Method (ADM), part II, a result from many architects, forms the core of TOGAF. It is a method for deriving organization-specific enterprise architectures and is specifically designed to address business requirements.

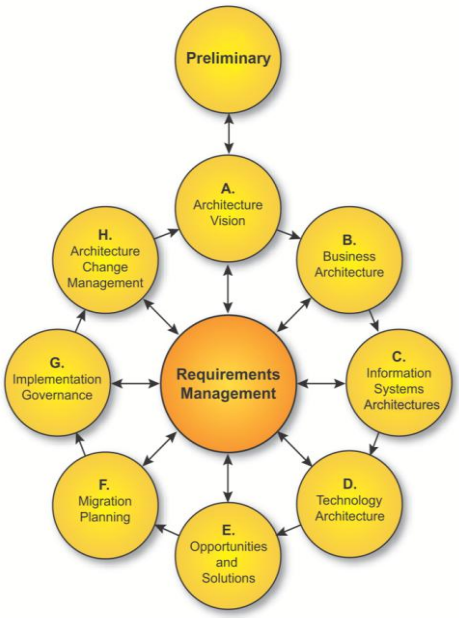


FIGURE 21: ITERATIVE PROCESS FOR THE DEVELOPMENT AND IMPLEMENTATION OF AN ENTERPRISE ARCHITECTURE (THE OPEN GROUP, 2009)

ADM describes (The Open Group, 2009):

- A reliable, proven way of developing and using an enterprise architecture;
- A method of developing architectures on different domains (business, application, data, technology) that enable the architect to ensure that a complex set of requirements are adequately addressed;
- Guidelines on tools for architecture development.

The ADM cycle consists of ten phases, which can be grouped in a way that closely matches the five phases of the business model innovation cycle of Osterwalder & Pigneur (2009). Jonkers, Quartel & Blom (2012) combined these two, see figure 22 stated below.

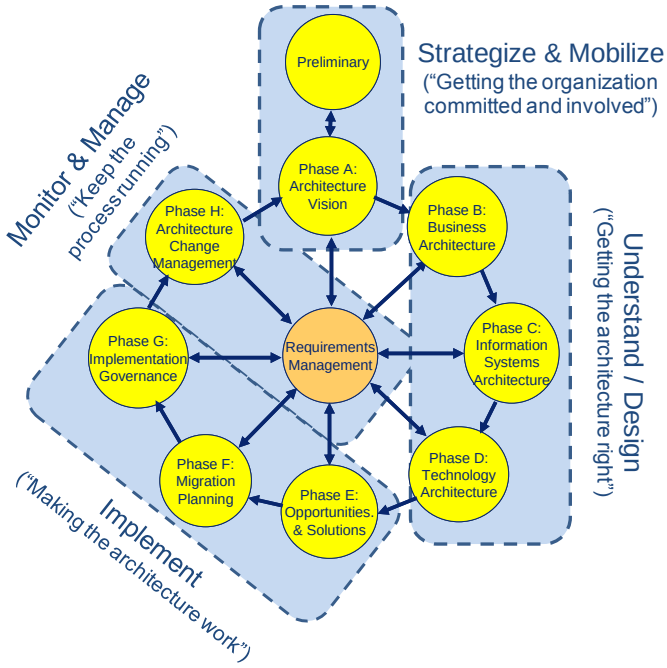


FIGURE 22: ADM CYCLE AND BUSINESS MODEL INNOVATION CYCLE COMBINED (JONKERS, QUARTEL & BLOM, 2012)

The methods are typically applied in a hierarchical way. The enterprise architecture development cycle as sketched above can be seen as an expansion of the implementation phase of the business model innovation cycle. The Business Model Canvas that has been designed and selected may be used to support the architecture vision presented in Phase A of the ADM at strategic/enterprise level. Subsequently, as described by TOGAF, the implementation-related phases of the ADM can be further refined into complete ADM cycles of more detailed domain architectures, or into design cycles for elements within the organization.

DYA

DYA® is a tried-and-tested set of best practices that can support organizations in the realization of an effective architectural function within an organization (www.dya.info). DYA is Sogeti's architectural approach and is introduced in 2001. DYA offers the following components:

- Working within an architectural structure, the foundation of DYA;
- DYA Infrastructure – an approach to infrastructural architecture ;
- DYA Software – an approach to software architecture;
- DYA Business – an approach to business architecture;
- DYA Governance – an approach to IT governance;
- DYA Principles – an approach to the development of architectural principles.

Basically, DYA is focused on working with architecture, not the development of architecture (van den Berg, Dijkstra, Schellen & Wouters, 2009).

ZACHMAN

The Zachman Framework for Enterprise Architecture (see Figure 24) was formally published in 1987. "Its aim was described as an architecture that represents the information systems' artifacts, providing a means of ensuring that standards for creating the information environment exist and they are appropriately integrated" (Pereira & Sousa, 2004). It proposes a logical structure for classifying and organizing the descriptive representations of an enterprise, in different dimensions, and each dimension can be perceived in different perspectives.

In the Framework of Zachman the architecture is described across two independent aspects. The rows represent the different perspectives, which may be used to view a business, a situation, an opportunity, or a system. The columns represent the different dimensions, which apply to each perspective of the business, situation, opportunity, or system.

The columns cover the following aspects (Zachman, 1987; Zachman, 1999; Op 't Land et al. 2009, p. 70), see figure 23 stated below.

FIGURE 23: THE ZACHMAN FRAMEWORK, SOURCE: DAVIDJROMANO.COM

3.4.2. Enterprise Architecture Modeling Techniques

In this subparagraph, some architecture modeling techniques are highlighted, for example Archimate, DEMO and UML. Each modeling language has its own advantages and disadvantages. At the end of the paragraph these languages are evaluated. This results in a choice of the type modeling language which is appropriate as EA modeling technique in my model-based approach.

ARCHIMATE

The ArchiMate enterprise architecture modeling language has been developed to provide a uniform representation for enterprise architecture descriptions. It offers an integrated architectural approach that describes and visualizes the different architecture domains and their underlying relationships and dependencies" (ArchiMate 2.0 specification, 2012, p. 1). In a short time, ArchiMate has become the open standard for architecture modeling in the Netherlands. In April 2009, it has been officially launched as an Open Group standard (TG9ob)

The enterprise is conceptualized of different aspects and at different levels of abstraction, when modeling the enterprise architecture. ArchiMate decomposes organizations along two dimensions: layers and aspects. Layers represent successive abstraction levels at which an enterprise is modeled. Aspects represent different concerns of the enterprise that need to be modeled. Common architectural domains can be positioned in this framework of layers and aspects (see figure 24 stated below). The ArchiMate language aims at high-level modeling of the main structures within the various architectural domains, as well as expressing the relationships between the domains. Figure 24 stated below depicts also the ArchiMate concepts and relationships, with their standard graphical representations.

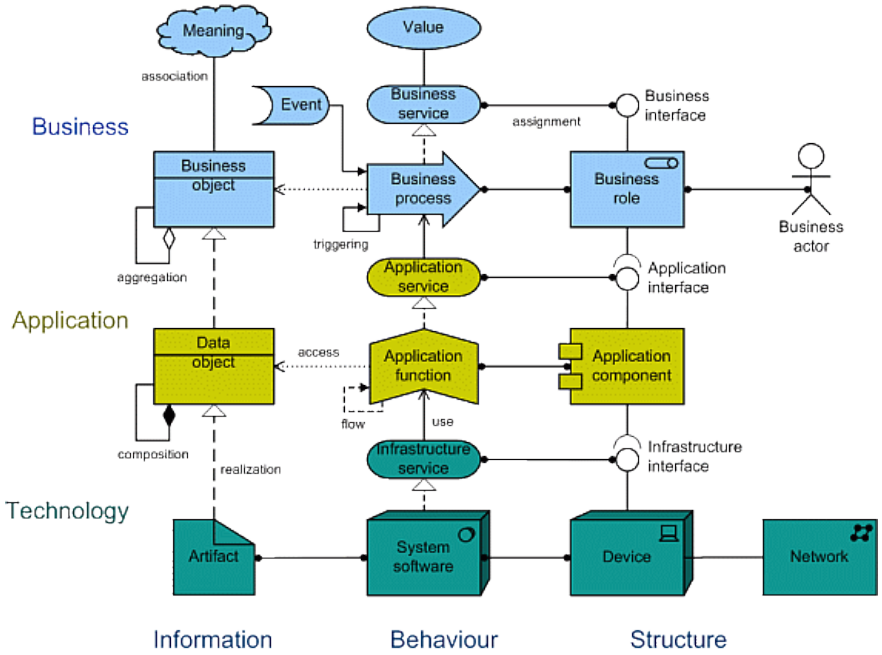


FIGURE 24: ARCHIMATE FRAMEWORK: LAYERS, ASPECTS AND CONCEPTS (SOURCE: WWW.ARCHIMATE.NL)

The layer dimension can be divided in the following three main layers:

Business layer:

Offers products and services to external customers that are realized in the organization by business processes;

Application layer:

Supports the business layer with application services that are realized by (software) application components;

Technology layer:

Offers infrastructural services (e.g., processing, storage and communication services) that are needed to run applications, and are realized by computer and communication devices and system software.

The aspects dimensions can be divided in the following aspects:

(Active) Structure:

Represents the actors (systems, components, people, departments, etc.) involved and how they are related;

Behavior aspect:

Represents the behavior (e.g., processes and services) that is performed by the actors, and the way the actors interact;

Information (or passive structure)

Represents the problem domain knowledge that is used by and communicated between the actors through their behavior.

Furthermore, ArchiMate 2 adds two extensions to the language. With these extensions, ArchiMate provides modelling support throughout the TOGAF ADM (Jonkers, Quartel & Franken, 2012):

The *Motivation extension* defines concepts to model the motivation for the choices made in the design of the architecture. This includes concepts such as stakeholder, driver, goal, requirement and principle. For motivation elements, a limited set of relationships has been defined, partly reused from the ArchiMate core.

The *Implementation & Migration extension* defines concept to support the identification of implementation projects and migration planning. This includes concepts such as work package, deliverable, plateau and gap.

DEMO

Design & Engineering Methodology for Organizations (DEMO) is a methodology for transaction modeling, and analyzing and representing business processes, developed at Delft University of Technology (Dietz, 2006). It is based on the language/action perspective, which emphasizes what people do while communicating, and how communication brings about a coordination of their activities. See figure 25 stated below for an example of a DEMO construction view.

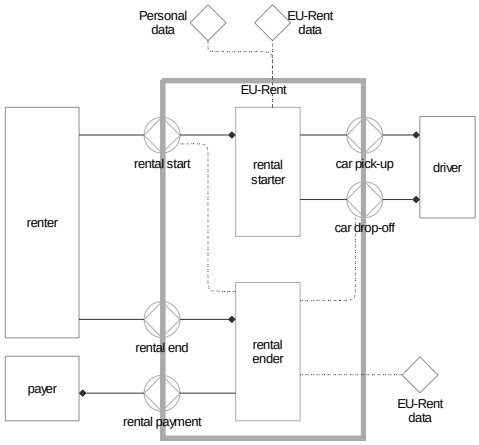


FIGURE 25: DEMO-MODEL (JONKERS, 2011)

UML

Another language in the modeling approach is the Unified Modelling Language (UML). This is an important industry-standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems, managed by the Object Management Group (OMG). UML emerged from the combination of three existing languages for object-oriented modeling (hence "unified") with an industrial origin (Jonkers, 2011). UML is the mainstream modeling approach within ICT, and its use is expanding into other areas. This makes UML an important language not only for modeling software systems, but also for business processes and for the general business architecture

UML is intended to be used by system designers. Therefore, UML models are only clear to those who have a sound background in computer science, in particular in object-orientation (Fowler and Scott, 1999). However, UML is not understandable and accessible for managers and organizational specialists; therefore, special visualizations and views of UML models should be provided (Jonkers, 2011).

3.4.3. EVALUATION

In this paragraph several EA methods and frameworks like TOGAF, DYA and Zachman and EA modeling techniques like Archimate, UML, DEMO and have been discussed. In this section, we evaluate these EA modeling techniques, methods and frameworks how they complement or function with each other. This motivates our choice for a particular EA modeling technique and method or framework, and argues why this one is better suited to our needs than the other. Moreover, which evaluation criteria should we consider important to these languages, methods and frameworks, particular in the case of servitization. Table 3 stated below depicts the evaluation of these EA methods and frameworks.

First of all, The Business Model Canvas provides an interface for the communication between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012). This is an very important criterion, because in our model-based approach the business modeling technique, Business Model Canvas, is used.

TOGAF 9 scores well on giving support to the development of the architecture at product and person within an organization (Van den Berg et al., 2009). In comparison with DYA, TOGAF offers more support on the product dimension, which is in the special case of servitization of critical interest, because with servitization the company is adding service to the product dimension.

Another important criterion is de widely acceptance of EA methods. It is not necessary to reinvent the wheel, and therefore the widely acceptance criterion is of great value. According to Iacob, Meertens, Jonkers, Quartel, Nieuwenhuis, van Sinderen (2011) is TOGAF the most widely accepted development method in the enterprise architecture domain.

According to Jonkers (2002) some advantages of the Zachman framework are:
- it is simple: it is easy to understand: not technical, purely logical;
- it is comprehensive: it addresses the enterprise as a whole and any issues can be mapped against it to understand where they fit;
- it is neutral: it is defined totally independently of tools or methodologies.

In our model-based approach several roles inside the company participate in the servitization process, and therefore the simplicity of an EA-method is needed. An important drawback of Zachman is the large number of cells, which is an obstacle for the practical applicability of the framework. And this criterion is in the special case of servitization a

critical point, in connection with the different roles that participate in this process. Besides, the relations between the different cells are hardly specified (Jonkers, 2002), which results in an difficult framework to work with.

Basically, DYA is focused on working with architecture, not the development of architecture (Van den Berg et al., 2009). In particular, DYA is aimed to get to work and retain the architecture function within the organization. When a company is going to servitize the architecture should be developed and/or changed, so DYA is not suited for our model-based approach.

Based on the scores on the relevant evaluation criteria, we chose TOGAF to be our EA method in our model-based approach. TOGAF and Zachman were very close, but the criteria "practical" and "support for the development of EA at product and person" are decisive. Especially in the case of servitization, because several roles in the company participate in this process. Now, architects can make their work understandable and accessible for managers and other roles in the organization.

Evaluation Criteria	TOGAF	DYA	ZACHMAN
Business Model Canvas used as starting point EA	++	-	+
Views and idea match with project goals	++	-	+
Wide Acceptance	++	-	++
Simple	+	+	++
Comprehensive	++	+	++
Support for the development of EA at product and person	++	--	-
Practical	+	-	--

TABLE 3: EVALUATION OF EA METHODS AND FRAMEWORK (JONKERS, QUARTE & FRANKEN, 2012; JONKERS, QUARTEL & BLOM, 2012; IACOB ET AL., 2011; VAN DEN BERG ET AL., 2009; LANKHORST, PROPER & JONKERS, 2010; FOWLER & SCOTT, 1999)

ArchiMate is positioned at the level of enterprise architecture, which implies that the ArchiMate language does not provide the level of detail one would typically find in languages used at the "design level" such as BPMN for business process design and UML application and technical infrastructure design (Lankhorst, Proper & Jonkers, 2010).

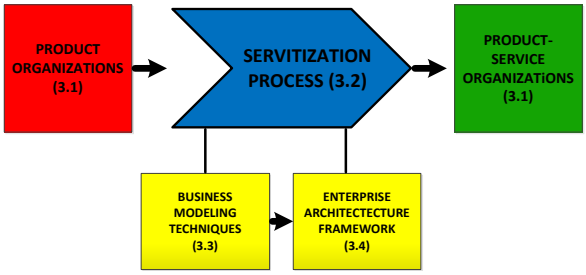
Instead of Archimate, UML is intended to be used by system designers. Therefore, UML models are only clear to those who have a sound background in computer science, in particular in object- orientation (Fowler & Scott, 1999). However, UML is not understandable and accessible for managers and organizational specialists; because the many different roles in the company who participate in the servitization process, this will certainly not be the modeling language.

Because architectures are often complex and hard to understand, architects need ways to express these architectures as clearly as possible: both for their own understanding and for communication with other stakeholders, such as system developers, end-users and managers (Jonkers, 2002). Instead of Demo and UML, models described in a common ArchiMate language are the basis for different types of visualization and analysis, which are the primary means for stakeholder communication. Different models and descriptions currently in use by architects, both at the business level and the application level, can be either mapped onto the common language or linked to the ArchiMate models (Jonkers, 2002).

Concluding, in the shared notion of enterprise architecture, TOGAF and ArchiMate have a firm common foundation. Both adopt the central concept of viewpoints on a single underlying model repository, aimed at a specific set of stakeholders and concerns. On the other hand, the standards complement each other: TOGAF provides an elaborate method, including a process, guidelines and techniques, for enterprise architecture development, while ArchiMate provides a well-defined language, including a graphical notation, for enterprise architecture modelling. Together, these two standards make up a complete and integrated approach to enterprise architecture (Jonkers, Quartel & Franken, 2012).

3.5. Chapter Conclusion

This chapter described the ingredients out of the literature which forms part of the designed model-based approach what is to come in chapter 4. This chapter was divided in four sections. The chapter started with an introduction of product-service organizations and highlighted the drivers to become more service-oriented (3.1). To become more service-oriented a structured process should be followed (3.2), therefore several business modeling techniques and enterprise architecture frameworks provide a useful support. Furthermore, these modeling techniques (3.3) and EA-frameworks (3.4) were evaluated at the end of the paragraph. To make the chapter clear and understandable, the bookmaker figure stated below is used.



"Servitization"

There are three different organizations, manufacturing organizations, service organizations or a combination of it. Reid & Sanders (2005) mentioned definitions to depict the difference between manufacturing organizations and service organizations: Manufacturing organizations are organizations that primarily produce a tangible product and typically have low customer contact. While service organizations are organizations that primarily

produce an intangible product such as ideas, assistance, or information and typically have high customer contact.

In the academic literature several definitions of servitization are used, but none of them are complete and clearly definitions, which embraces the whole scope and relevance of servitization. Therefore I came with an own definition, which is based on the definition of Visjnic (2010) and Ren & Gregory (2007), Neely (2008), and is as follows:

"Servitization is a business model innovation wherein manufacturing companies embrace a service orientation and expands the scope of transactions with customers by offering product related services and, hence more encompassing solutions, with the aim to satisfy customer needs, enhance the firm's performance and achieve competitive advantages".

The revenue model of integrated products is nowadays moved to the service side. According to a survey of the Association of German Equipment Manufacturer (VDMA, 1998), the profit margin of equipment averages at 1%, while services, such as maintenance, installation and process supporting services, averagely provide a profit margin of more than 10% (Gao et al, 2009). The competitive advantage can be based on the product or on the service, and the ownership of a PSS may or may not be transferred from sellers to buyers during transactions. According to Cook et al. (2006) them PSS's could be categorized into three classes, product-oriented, application-oriented and utility-oriented.

There are several reasons or drivers for manufacturing companies to servitize. These are economic, environmental and a competitive (strategic) drivers. According to the literature, the transformation paths from a product-oriented strategy to a combined product-service strategy are still poorly understood and remain a new and complex concept (Voss, Tsikriktsis, Frohlich, 2002; Johnston, 1995; Miller, Hope, Eisengstat, Foote & Galbraith, 2002; Tukker, 2004; Martinez, Bastl, Kingston & Evans, 2010).

Servitization process

There are several process models and modeling techniques that can support the servitization process, and are therefore of great value. The main process steps according to Grönroos (2007) are:

These steps are too general, therefore we made a more detailed process. These more detailed steps are based on the service innovation process of Flikkema et al. (2008) and the business model innovation process of Osterwalder & Pigneur (2010). The best elements out of these existing process models are combined to provide a new own servitization process model. This results in the following (detailed) steps to servitize:

Business Modeling Technique

There are also some models and techniques to support these processes. We evaluated three business modeling techniques, Canvas, STOF and e3-value. The Business Model Canvas scores at the relevant criteria in the special case of servitization ("focus on innovation", "ease of use", "material look/feel" and "support") the best. The Business Modeling techniques that should support these steps is the Business Model Canvas. The Canvas is very easy to understand and easy to explain to others. The people get excited and can almost start instantly. Besides it is a hands-on tool that fosters understanding, discussion, creativity, and analysis. Furthermore, the Business Model Canvas is very well described in several books (e.g. "*Business Model Generation"* van Osterwalder & Pigneur (2010)) and on websites, therefore the availability of the material is great. The Canvas is a useful method for innovation, and therefore very applicable on the "servitization process".

EA Method/Framework

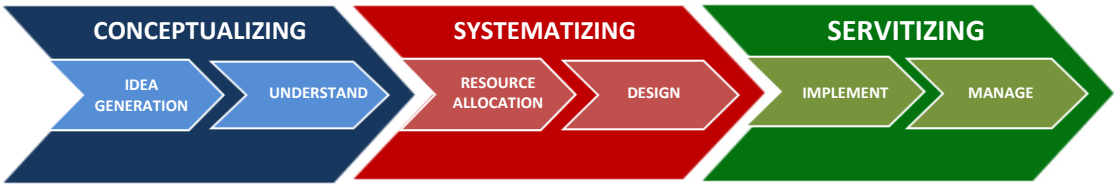
We evaluated three enterprise architecture methods, TOGAF, DYA and Zachman. TOGAF scores at the relevant criteria in the special case of servitization the best. TOGAF and Zachman were very close, but the criteria "practical" and "support for the development of EA at product and person" are decisive. Especially in the case of servitization, because several roles in the company participate in this process. Now, architects can make their work understandable and accessible for managers and other roles in the organization. Furthermore, the Business Model Canvas provides an interface to communicate between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012).

The Business Model Canvas currently receives a lot of attention. However, a business model in isolation does not make a successful business: the step towards implementation of the business model is crucial. The development of an enterprise architecture forms the first stage in the implementation trajectory. Therefore, it is important to show how a business model can be used as a starting point for architecture development, and how the conformance of the enterprise architecture to the business model can be safeguarded (Jonkers, Quartel & Blom, 2012). The changed business model, has also impact on the organization structure and the architecture. And this aspect is very important, because the step to implementation is key (Jonkers, Quartel & Blom, 2012). This implementation part will be supported by the TOGAF ADM process.

The modeling techniques, methods and analysis techniques that are supporting the relevant process steps, are mentioned in the next chapter.

CHAPTER 4: MODEL-BASED APPROACH TO SUPPORT THE SERVITIZATION PROCESS

For our model-based approach, we combined three innovation methods found in literature (Grönroos, 2007; Osterwalder & Pigneur, 2012; Flikkema et al., 2011). This results, as described in previous chapter, in the following process model to servitize:

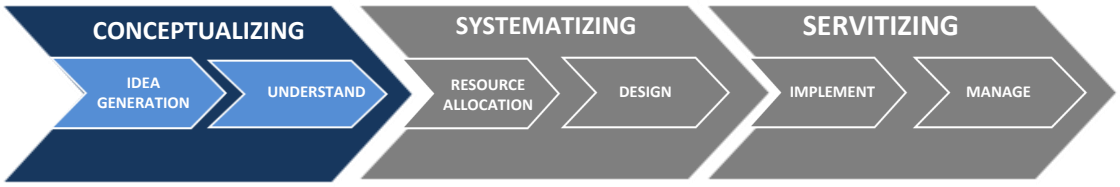


This chapter is also validated by experts of BiZZdesign and Novay in a validation workshop (see chapter five for more information), the feedback has already been processed in this chapter.

Furthermore, these several steps are also the structure of this chapter. For each step, we define the involved roles, objectives, tasks inputs, and outputs. In any successful model-based approach, methodological support and tool support are indispensible. The method and tools should cover the whole trajectory from strategy to implementation. Tools help to create and manage models, and maintain traceability among the different types of models. They also enable different types of visualization and analysis (e.g. SWOT analysis, Porter's Five Forces, PESTEL and cost-benefit analysis) that help in the selection between alternative models or the optimization of models (Jonkers, Quartel & Blom, 2012). Why several methods/techniques are chosen is described in chapter three. The examples of the elaboration of the several analysis techniques are stated in chapter five.

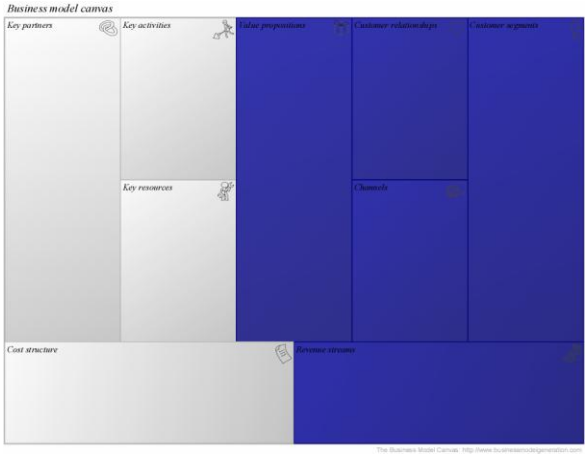
These Business Model Canvas provides an interface for the communication between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012).The TOGAF ADM process which is recommended in this model-based approach is not described in detail, because the scope of this research project would be too broad and has no focus. So, this model-based approach is basically concentrated on business model level, and not in depth on EA level.

4.1. STEP 1: CONCEPTUALIZING

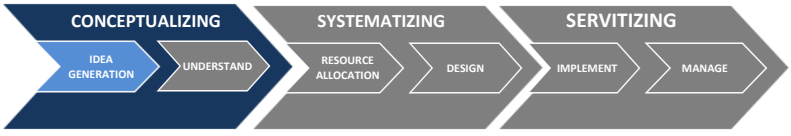


In the "conceptualizing" step, ideas for a new value proposition are generated, relevant customer segments are identified, together with the delivery channels and ways to maintain customer relationship and ways to generate revenues. Actually, the right-hand side of the Business Model Canvas (colored blue) of Osterwalder & Pigneur (2009) can be used to document the results of this. So, this step refers to changes in value proposition (VP), customer relationships (CR), channels (CH) and customer segments (CS) and revenue streams (R$).

This conceptualizing step can be divided in several more detailed steps. According to the business model innovation process, this step can be divided in "mobilize" and a part of the "understand" step. Because this is a little bit confusing, the first step of the service innovation process of Flikkema et al. et al. (2010) "idea generation" is chosen. The second step in the conceptualizing phase is "understand".



4.1.1. IDEA GENERATION

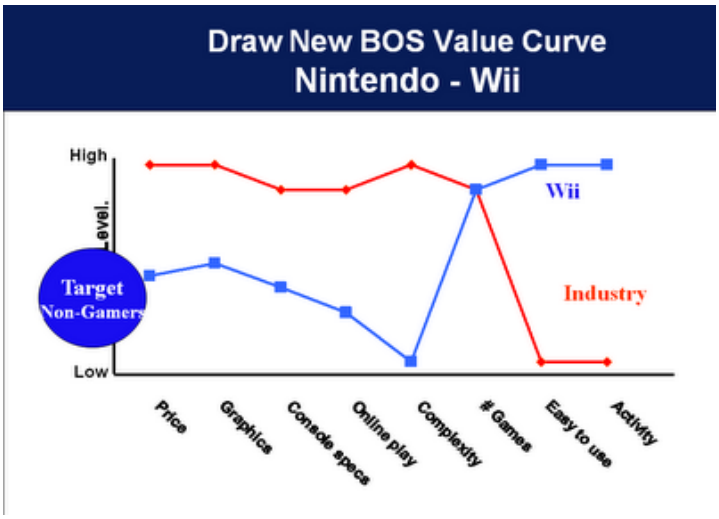


Crucial activities in this first phase include assembling the project team and gaining access to the right people and information. It is necessary to seek a mix of people with broad management and industry experience, fresh ideas, the right personal networks, and a deep

commitment to business model innovation. Besides, it is useful to have potential customers in this team.

It is necessary to know where we stand as organization, it would be useful to perform a SWOT, PESTEL and Porter's Five Forces on the present situation. When starting with a SWOT about the present situation, the weaknesses and threats can give some opportunities in the product-service area. The well-known five forces analysis by Porter is used for discussing various drivers that force companies to change their service portfolio and consider an approach of servitization. See chapter five for an elaboration example of these techniques, the elaboration is based on the case Philips Lighting which also is described in chapter five.

In the beginning of this idea generation step, it is time to do a brainstorm-session, using the free-wheeling technique. I chose this technique because they generate ideas that may produce some that seem half-baked, but it can lead to new and original solutions to problems (workforceatm.org). An example of a brainstorm session is viewed in the appendix. The brainstorm-session results in a lot of raw-ideas, which should be filtered later on.
Furthermore, to find a new value proposition a "blue-ocean"-strategy of Kim and Mauborgne (2005) will be very useful. Besides, this will give a valuable contribution to presents frameworks, like Porter's Five Forces, which addresses the current competition field. The strategy canvas is both a diagnostic and an action framework for building a compelling blue ocean strategy. It will be helpful in this phase to use the strategy Canvas. Firstly, it captures the current state of play in the known market space. This allows you to understand where the competition is currently investing and the factors that the industry competes on. Secondly, it propels you to action by reorienting your focus from competitors to alternatives and from customers to noncustomers of the industry (blueoceanstrategy.com). See figure below for an example of the Nintendo – Wii.



It is important to make decisions what products and services should be offered and how. For example: logistical, repair and maintenance, educational, advisory, invoicing, problem-solving and other activities should function in order to support value-in use for the

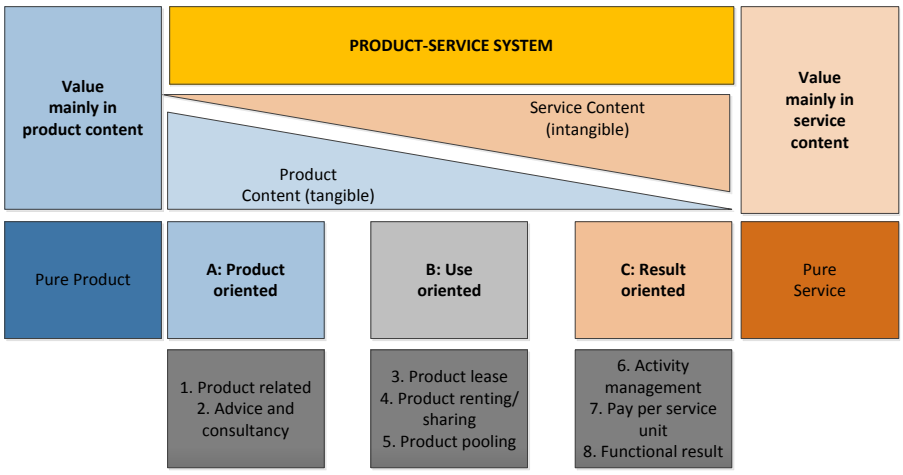
customer over the customer life cycle. According to Grönroos (2007) the "conceptualizing" step has several aspects to take in consideration. Behind the following questions is stated "what building blocks of the Business Model Canvas the question has impact".

- What kind of support for customers? **(VP)**
- How is value created in the customer's process? **(VP)** Understanding what value means to customers and consumers (not producers and suppliers) is according to Neely (2010) a challenge, as part of the *business model and customer offer* challenge.

Subsequently, we can use another tool of the Blue Ocean Strategy of Kim & Mauborgne (2005), the 4 Actions Framework (recommended in validation workshop). To reconstruct buyer value elements in crafting a new value curve, we use the 4 Actions Framework. As shown in the diagram above, to break the trade-off between differentiation and low cost and to create a new value curve, there are four key questions to challenge an industry's strategic logic and business model:

Which of the factors that the industry takes for granted should be *eliminated*?
Which factors should be *reduced well below* the industry's standard?
Which factors should be *raised well above* the industry's standard?
Which factors should be *created* that the industry has never offered?

Concerning to VP, the value offered in a PSS is based on an integration of product and service. Then, it can differ basically on the relationship between the producer and the customer, such as: product-oriented service, use-oriented services and result-oriented services, see the figure of Tukker (2004) stated below. This figure is described in previous chapter.

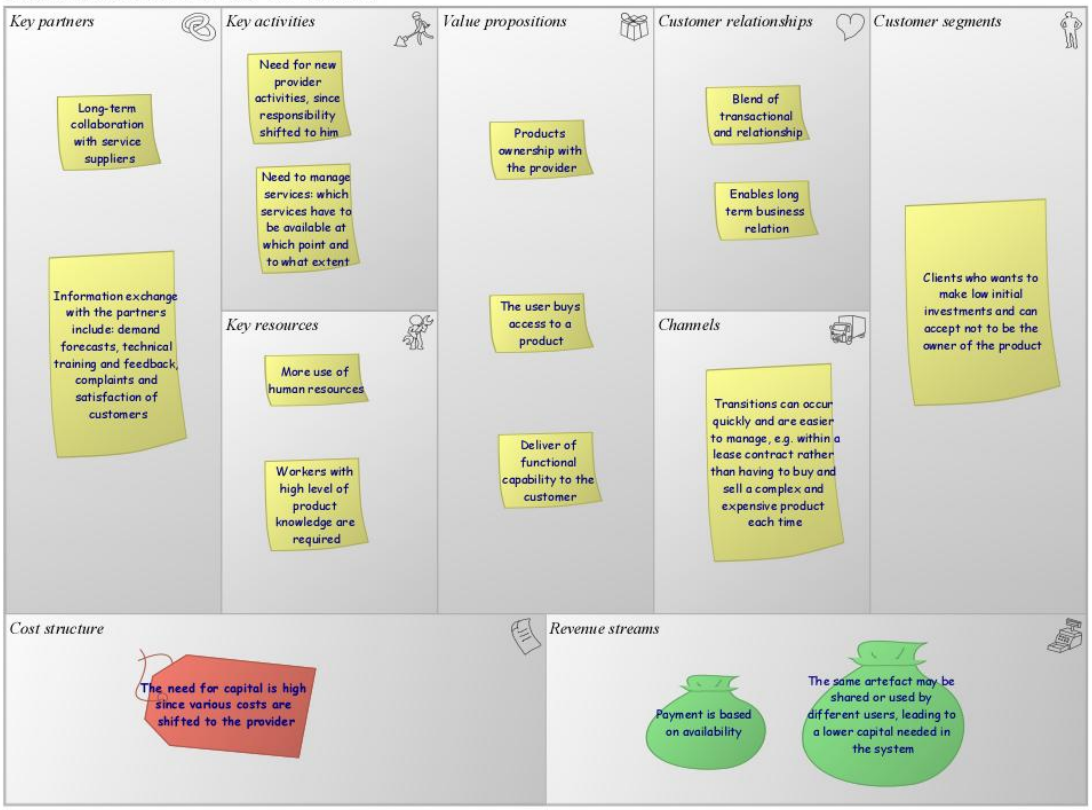


According to Barquet et al. (2011) the choice of being (desired situation) product oriented, use oriented or result oriented has impact on the Business Model Canvas, see the three different Business Model Canvas stated below (Barquet et al., 2011).

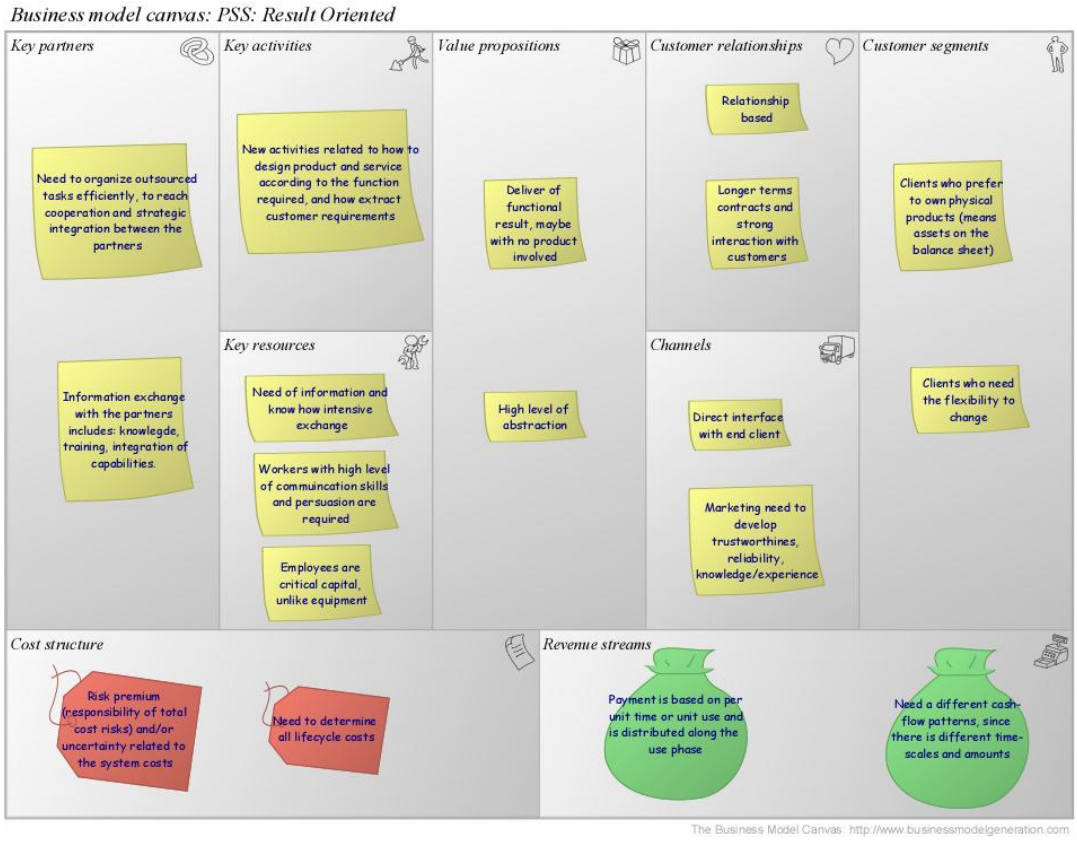
Business model canvas: PSS: Product Oriented

The Business Model Canvas: http://www.businessmodelgeneration.com

Business model canvas: PSS: Use Oriented



The Business Model Canvas: http://www.businessmodelgeneration.com



- How are customer touch points handled? **(CH)**

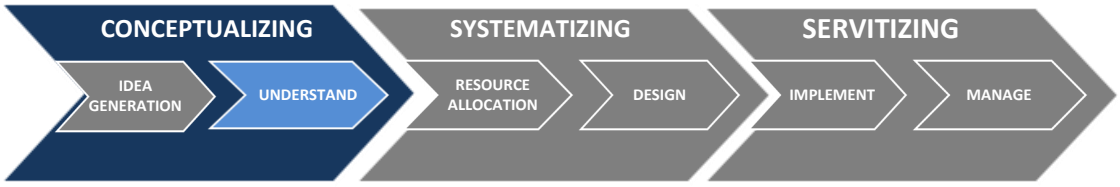
For CH, sales and retail departments should define how the PSS should be offered and priced to be more attractive than buying a product based option. Training of retail and sales personnel is often necessary as well as changes to pull PSS adoption (Mont, 2004). It is also important to make careful argumentation in marketing campaign, clarifying customers about the PSS usage.

At the end of this phase it is important to make a selection of ideas. It is useful to organize a ***kill/thrill session*.** In this session all participants are tasked with **brainstorming** for 20 minutes on reasons why the idea won't work ("the kill portion"), then spend 20 minutes brainstorming exclusively on why the idea will fly (the "thrill" portion). The ideas that you now have generated, can be more filtered. For example from 50 to 20 ideas. See chapter five for an elaboration of the kill/thrill session.

Step1: "Idea Generation"	
Role	*Work floor employees, Sales, Marketing, Consultants and Potential Customers*
Objectives	*Prepare for a successful business model design project*
Inputs	*Strategic, economic, environmental rationales*
Tasks	*Frame project objectives, test preliminary business ideas, plan assemble team, brainstorm session*
Outputs	*Raw ideas, objectives*
Methods/techniques	*Present situation: SWOT, Porter's Five Forces, PESTEL,* *Desired situation: Brainstorming session, Strategy Canvas, 4 Actions Framework and kill-thrill-session*

After these methods or analysis techniques, there are some ideas for servitizing and objectives are specified. Now, it is *time to "understand" these, and to scan the environment and the customer.*

4.1.2. UNDERSTAND



Now, it is important to "understand" the environment: scan the environment, interview experts, study potential customers, and collect ideas and opinions. The following aspects should take into consideration according to Grönroos (2007), Tukker (2004) and Barquet, Cunha, Oliveira & Rozenfield,(2011):

- How could interactions function with the customer's various processes? **(CR)**

CR: It is necessary to create added value and delivery it through direct relation and intensified contacts with customers, which enables the development of long-term relationships instead of short-term and transaction-based relationship found in the traditional "selling products" context.

- What should this servitizing-process lead to, in terms of support to customers' everyday activities and processes? **(CS)**

With regards to CS, it is important to take into account what kind of ownership ideas this specific target group has, cultural and regional differences and consumer habits, and also behavior and values (Tukker, 2004; Barquet, 2011).

- What do you think to earn with this new VP? Will it be valuable for your business? (R$)

There are useful techniques to give an insight into the environment. Environmental scanning can be defined as 'the study and interpretation of the political, economic, social and technological events and trends which influence a business, an industry or even a total

market' (Kroon, 1995). To scan the environment on a macro level, the **PESTEL analysis** can be used, and is a more general scanning method. These external factors indirectly affect the organization, but cannot be controlled by the organization. PESTEL analyze the following factors: Political, Economic, Social, Technological, Environment and Law.

Another possible technique is **Porter's Five Forces analysis**; this analysis is more focused on the competitive element and is in fact a competitor analysis. Porter's Five Forces is a strategic marketing model, which the company is capable to tune the company on the attractiveness on the market. Porter's Five Forces give a good indication of the relative attraction of the industry. And in the case of servitization, how can you be distinctive with respect to the competitor.

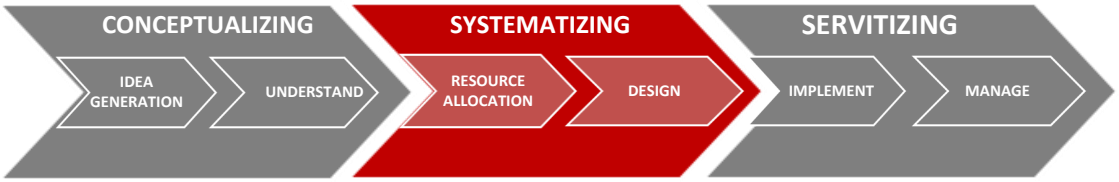
Subsequently, it is crucial to scan the customer. A useful method to scan the customer is the **Empathy Map,** a tool developed by visual thinking company XPLANE. Using this method, it allows you to devise a stronger business model, because a customer profile guides the design of better VP, more convenient ways to reach customers, and more appropriate CR. This is really important in the case of servitization, because the company should be more "customer centric" (Atos Consulting, 2011). Ultimately, it allows you better to understand what a customer is truly willing to pay for (Osterwalder & Pigneur, 2009). The six questions in this empathy map are (in the eyes of the customer): What does she see?; What does she hear?; What does she really think and feel?; What does she say and do?; What is the customer's pain?; What does the customer gain?. Customers profiling enables you to generate better answers to questions such as: Does this VP solve real customer problems? Would she really be willing to pay for this? How would she like to be reached?

After this session, it is time to specify the objectives of this project identifying the internal and external factors that are favorable and unfavorable to achieve that objective. There is a strategic planning method to evaluate Strengths, Weaknesses, Opportunities and Threats **(SWOT).** It is useful to ask questions according to these four factors with respect to both the overall business model and each of its nine building blocks. Results from the questions can become the foundation for business model change and innovation in your organization. These analysis techniques (PESTEL, Porters Five Forces, SWOT and Empathy Map) are used, because they work well in creative sessions. When there are some different views on the environment, people think out of the comfort zone and results in more creativity (Interview Frank Bakema, 2012) .

It is useful to organize a ***kill/thrill session*.** In this session all participants are tasked with **brainstorming** for 20 minutes on reasons why the idea won't work ("the kill portion"), then spend 20 minutes brainstorming exclusively on why the idea will fly (the "thrill" portion). The ideas that you now have generated, can be filtered to a few ideas.

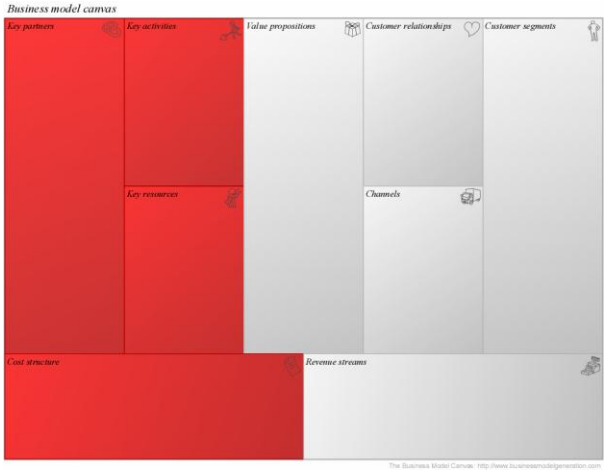
Step 2: "Understand"	
Roles	*(product and process) Manager(s), R&D, Service Engineer(s), Work Floor employees, Potential Customers, Domain Experts, Sales and Marketing*
Objectives	*Research and analyze elements needed for the business model design effort and selection of ideas*
Inputs	*Raw ideas, objectives*
Tasks	*Scan environment, interview experts, study potential customers, and collect ideas and opinions, filtering of useful ideas.*
Outputs	*Understanding of the environment and the customer, selection of ideas*
Methods/techniques	*Environment: PESTEL, Porter's Five Forces* *SWOT* *Customer: Empathy map* *kill-thrill-session*

4.2.1. STEP 2: SYSTEMATIZING

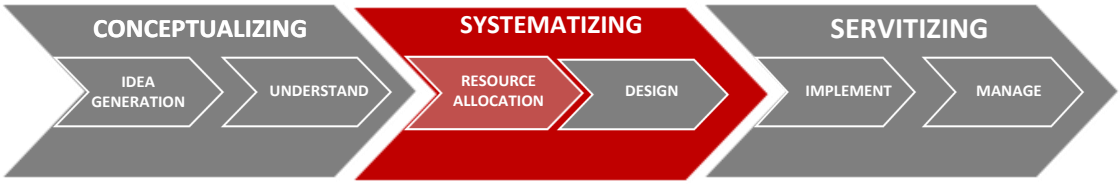


When the first step is completed, the second step "systematizing" should go into operation. This step can be divided in the steps "resource allocation" and "design" of Flikkema et al. et al. (2010). Besides, Osterwalder & Peigner (2009) also performs the "design" step in their process.

In the "systematizing" step, the key activities are discussed, key partners and resources are identified and the ways the costs are structured. Actually, the left-hand side of the Business Model Canvas (colored red) of Osterwalder & Pigneur (2009) can be used to document the results of this. So, this step refers to changes in key partners (KP), key activities (KA), key resources (KR) and cost structure (C$).



4.2.2. *Resource Allocation*



According to Grönroos (2007) the "systematizing" step has several aspects to take in consideration. Behind the following questions/aspects to think of, is stated on what building blocks of the Business Model Canvas this has impact:

- What kind of resources and processes are needed for the firm to support customer's activities and processes in a value generating way? **(KR/KA)**

Regarding to the KR, particularly human resources, PSS providers have to make considerable investments into human asset. New competences about customers need to be developed, people trained and sometimes additional personnel recruited. It is also required a fundamental shift in corporate culture and market engagement, which requires time and resources (Mont, 2004).

- Organize resources and processes that constitute the offering **(KA/KP/KR**)
- Coordinate the way various resources and processes function **(KA/KP/KR)**

To structure a PSS network, it is necessary to identify what are the required core competences. In the PSS business model, the relationship between producer and stakeholder is recognized with wide scope and has a considerable impact on the supply chain structure (Barquet et al., 2011).

- Make a benefit-analysis based on long-term cost, to determine the limits for flexibility in the way resources and processes function. **(C$/R$)**

A **cost-benefit analysis** is an analysis to evaluate the desirability of a project or given policy (Dunn, 2009) and has the following steps to follow:

1. List alternative servitize projects/programs.
2. List stakeholders.
3. Select measurement(s) and measure all cost and benefits elements.

4. Predict outcome of cost and benefits over relevant time period.
4. Convert all costs and benefits into a common currency.
5. Apply discount rate.
6. Calculate net present value of project options.
7. Perform sensitivity analysis.
8. Adopt recommended choice.

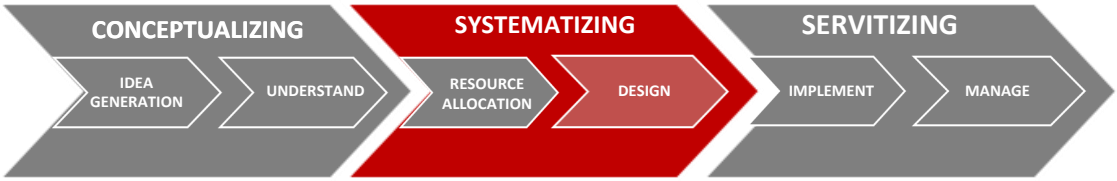
The PSS also gives opportunity to raise revenue through improving the function offered by the PSS provider. However, when it involves more than one company, the revenue distribution needs to be well managed among partners to avoid misunderstandings.

A challenge concerning to PSS is how to manage the CS and how to set a suitable price for the PSS. The financial and accounting functions may need to adapt their practices to new profit centers. The timescale of financial flows changes considerably from an almost immediate return of the capital to an extended use period. That means, the PSS provider needs to hold the necessary financial resources or to have the financing partners support to bridge this period. Payments might be based on availability of the PSS, frequency of use or final result. When the function of products is sold, cost structures may need to be restructured to support different cash-flow requirements. So, in a PSS the payback period for the value delivered can be longer than in a pure product-selling context (Barquet et al., 2011).

After this session another kill-thrill session is performed, which should result in 2-3 useful ideas. It is possible that the best idea is killed, because for example the costs of the idea where to high.

Step 3: "Resource Allocation"	
Roles	*(product and process) Manager(s), R&D, Service Engineer, Work Floor Employees, Domain Experts, Sales and Marketing, Key Partners*
Objectives	*Research and analyze the resources elements needed for the business model design effort*
Inputs	"The value"of the servitization (the right hand-side of the Canvas): VP, CS, CH, CR and R$, few ideas
Tasks	Resource investigation (financial, customers), analyzing cost and benefit (listing stakeholders, predict outcome, calculating NPV)
Outputs	Insights in the financial aspects (cost and benefits), key partners, and personnel needed, 2-3 ideas
Methods/techniques	*Cost-benefit analysis, kill-thrill session*

4.2.3. DESIGN



In this step it is important to think through multiple business model options before selecting the one you want to implement. It is the case, to transform the information and ideas from the previous phase into business model prototypes that can be explored and tested. You should select the most satisfactory business model design, after an intensive business model inquiry. The organization should experiment with different partnership models, seek alternative revenue streams, and explore the value of multiple distribution channels. According to Osterwalder & Pigneur (2009) it is important to explore and test new possibilities with trying out different business model patterns.

So, prototyping business models is a useful step in this phase. A business model prototype can be anything from a rough sketch of an idea on napkin to a detailed Business Model Canvas to a field-testable business model. Business model prototyping is about a mindset we call "design attitude". It stands for sketching both many rough and detailed prototypes, to discover new and better business models, representing many strategic options.

Osterwalder & Pigneur (2009) discussed a possible way to design prototypes and test them. This prototyping method is divided into 4 steps:

(1). Napkin sketch

In this step, the organization should outline and pitch the rough ideas to servitize. It is needful, to draw a simple Business Model Canvas, describing the idea using only key elements. This is also done in the first phases "idea generation", "understand" and "resource allocation", and even in a more detailed level. In this phase it is not based on a very detailed level, for example outline the idea, include the VP and include the R$.

(2). Elaborated Canvas

In this step, the organization should explore what it would take to make the idea work. In this step it is the idea to develop a more elaborated Canvas to explore all the elements needed to make the business model work. This step should also be not too difficult, because all these aspects of the various "building blocks" are discussed in the "conceptualizing steps" and the "resource allocation step". This step is typical of developing a full Canvas, think trough your business logic, estimate the market potential (PESTEL, Porter's Five Forces), and understand the relationships between the building blocks.

(3). *Business case*

In this step, the organization should examine the viability of the idea. The organization should turn the detailed Canvas into a spreadsheet to estimate your model's earning potential. So, create a full Canvas, what is created in step 2, and include key data and

calculate costs and revenues. Then the profit potential can be estimated. To make this estimation, the organization should run financial scenarios based on different assumptions.

(4). Field-test

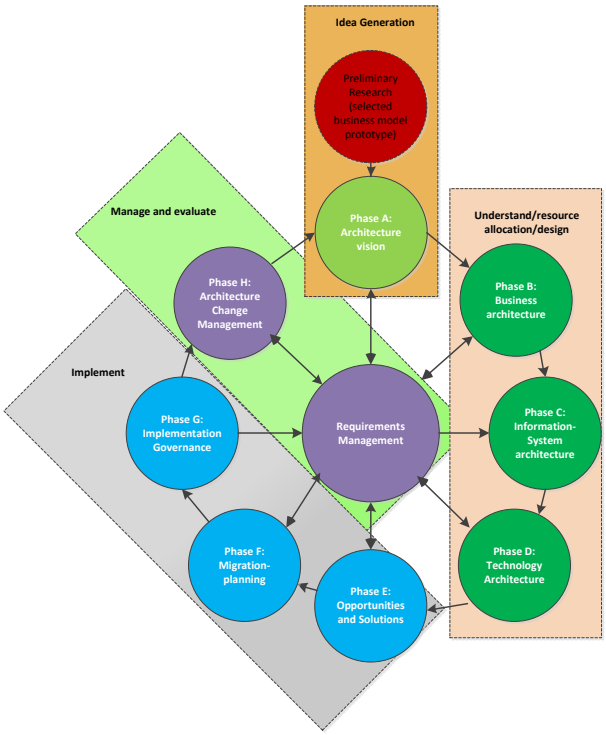
In this step, the organization should investigate customer acceptance and feasibility. At this moment the organization have chosen a potential new business model, and now we want to test some aspects in the field. It is needful to prepare a well-justified business case for the new model. Besides, include prospective or actual customers in the field test and test the VP, CH, pricing mechanism.

After this prototyping session, a new filter of ideas is made. At this moment you should have one useful working idea, now it is time to make a link to the enterprise architecture. The Business Model Canvas provides an interface for the communication between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012).

TOGAF

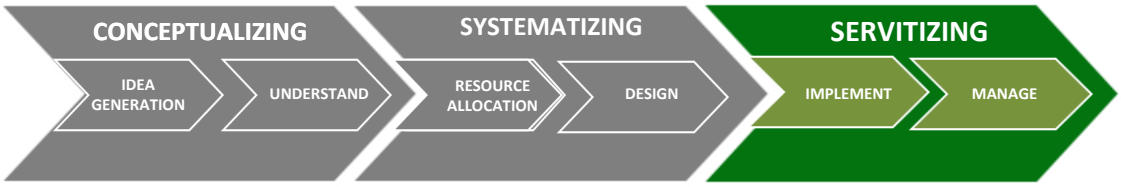
Applying a new business model, has also changes in the architecture of the organization and subsequent design and implementation of business processes and IT support. A good method to support this step is TOGAF. TOGAF reflects the structure and content of an architecture capability within an enterprise. ADM forms the core of TOGAF and is a method for deriving organization-specific enterprise architectures and is specifically designed to address business requirements. It is a reliable and proven way of developing and using enterprise architecture and it is a method of developing architecture on different domains (business, application, data, technology) that enables the architect to ensure that a complex set of requirements are adequately addressed. Moreover, ADM provides a number of architecture development phases (e.g. business architecture, information systems architectures, technology architecture) in a cycle, as an overall process template for architecture development activity (Op ‘t Land et al., 2009). So, in this step we follow the ADM process steps. As illustrated in the figure below, the several steps to servitize has some influence on the architecture of the organization.

ArchiMate is the standard for modeling and analyzing architecture. It is a graphical design language, which business and IT-architectures could model consistently. TOGAF and ArchiMate form a powerful combination. ArchiMate provides a vendor-independent set of concepts, that helps to create a consistent, integrated model “below the waterline”, which can be depicted in the form of TOGAF views. ArchiMate enables modeling throughout the TOGAF ADM.



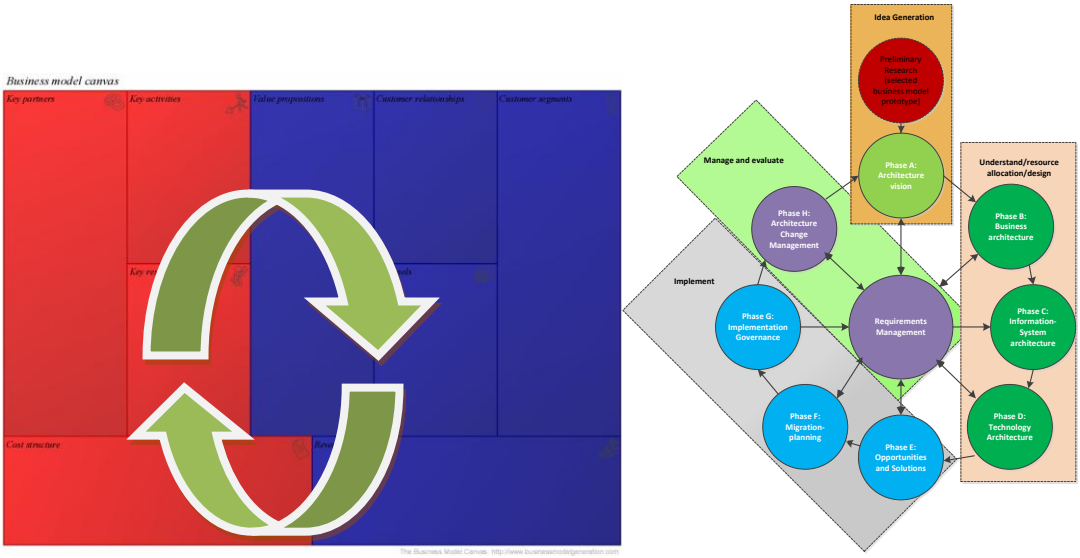
Step 4: "Design"	
Roles	*(product and process) Manager(s), R&D, Service en Process Engineer(s), Work floor employees, Domain Experts, Architect(s), Controller/Accountant*
Objectives	*Generate and test viable business model options, and select the best*
Inputs	*Information and ideas, architecture vision*
Tasks	*Business model inquiry, selecting most satisfactory business model design, developing architecture at three levels (business, information system and technology)*
Outputs	*Elaborated Canvas on one idea , development of the business, information and systems technology architecture*
Methods/techniques	*Prototyping, TOGAF ADM with ArchiMate (Business Architecture, Information System Architecture and Technology Architecture)*

4.3. STEP 3: SERVITIZING

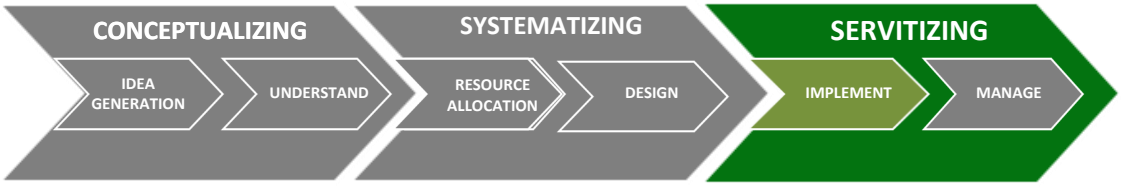


When the second step "systematizing" is completed, the third and last step "servitizing" should go into operation. Also this step of Grönroos (2007) can be divided in more detailed

steps, like “implement” and “manage”. In this step the business model should be managed and also be evaluated. The goal of this step is to develop all resources and processes to support customer’s everyday activities and processes, regardless of what these activities and processes are, in a way that guarantees that value-in-use is created in those processes. According to Grönroos (2007) and Neely (2010) the “servitizing” step has several aspects to take in consideration.



4.3.1. *IMPLEMENT*

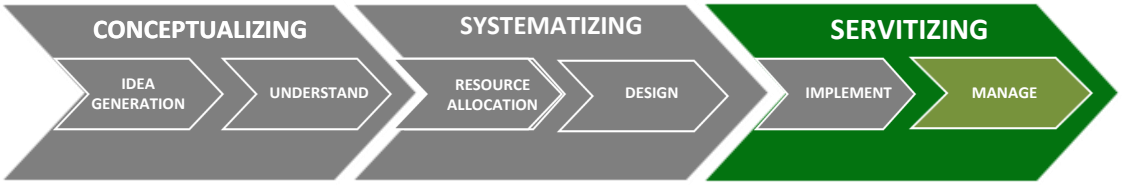


In this step the selected business model design should be implemented. This has also some influence on the EA of the organization. This step is typical for the “Migration Planning” and the “Implementation Governance” of the TOGAF ADM. According to Grönroos (2007) and Neely (2010) there are several aspects to think of:

- The various processes and customer contacts should indeed function in a value-supporting manner
- Develop a service culture: challenge mentioned by Neely (2010)
- *Shifting mindsets:* challenge of servitization mentioned by Neely (2010):
    - Of marketing – from transactional to relational
    - Of sales – from selling multi-million dollar products to selling service contracts and capability
    - Of customers – from wanting to own the product to being happy with the service sometimes customers has to be educated how to participate in the process.

Step 5: "Implement"	
Roles	*Process engineer(s), Domain Experts, Architect(s)*
Objectives	*Implement the business model prototype in the field*
Inputs	*Elaborated Canvas , Development of the business, Information and systems technology architecture*
Tasks	*Implementing the selected business model design, developing detailed Implementation and Migration Plan, Provide architectural overview for the implementation*
Outputs	*Selected business model is implemented and architecture overview*
Methods/techniques	*TOGAF ADM with ArchiMate (Migration Planning and Implementation Governance)*

4.3.2. MANAGE



In this step it is important to adapt and modify the business model in response to market reaction. It is necessary to set up the management structures to continuously monitor, evaluate, and adapt or transform the business model (Osterwalder & Pigneur, 2009). This step has impact on the "Architecture Change Management" and "Requirements Management" of the TOGAF ADM process. Phase H of TOGAF takes care of the architecture changes and manages these on a controlled manner. According to Grönroos (2007) and Neely (2010) there are several aspects to think of:

Attitude, knowledge, skills off people, the capabilities of physical resources, systems and infrastructures should function in a customer focused way and the customer focused quality of the leadership provided by managers and supervisors have to be ensured. This is also a challenge, mentioned by Neely (2010).

Beware of the challenge of *timescale,* mentioned by Neely (2010):
- Managing and delivering multi-year partnerships;
- Managing and controlling long term risk and exposure;
- Modeling and understanding the cost and profitability implication of long-term partnerships.

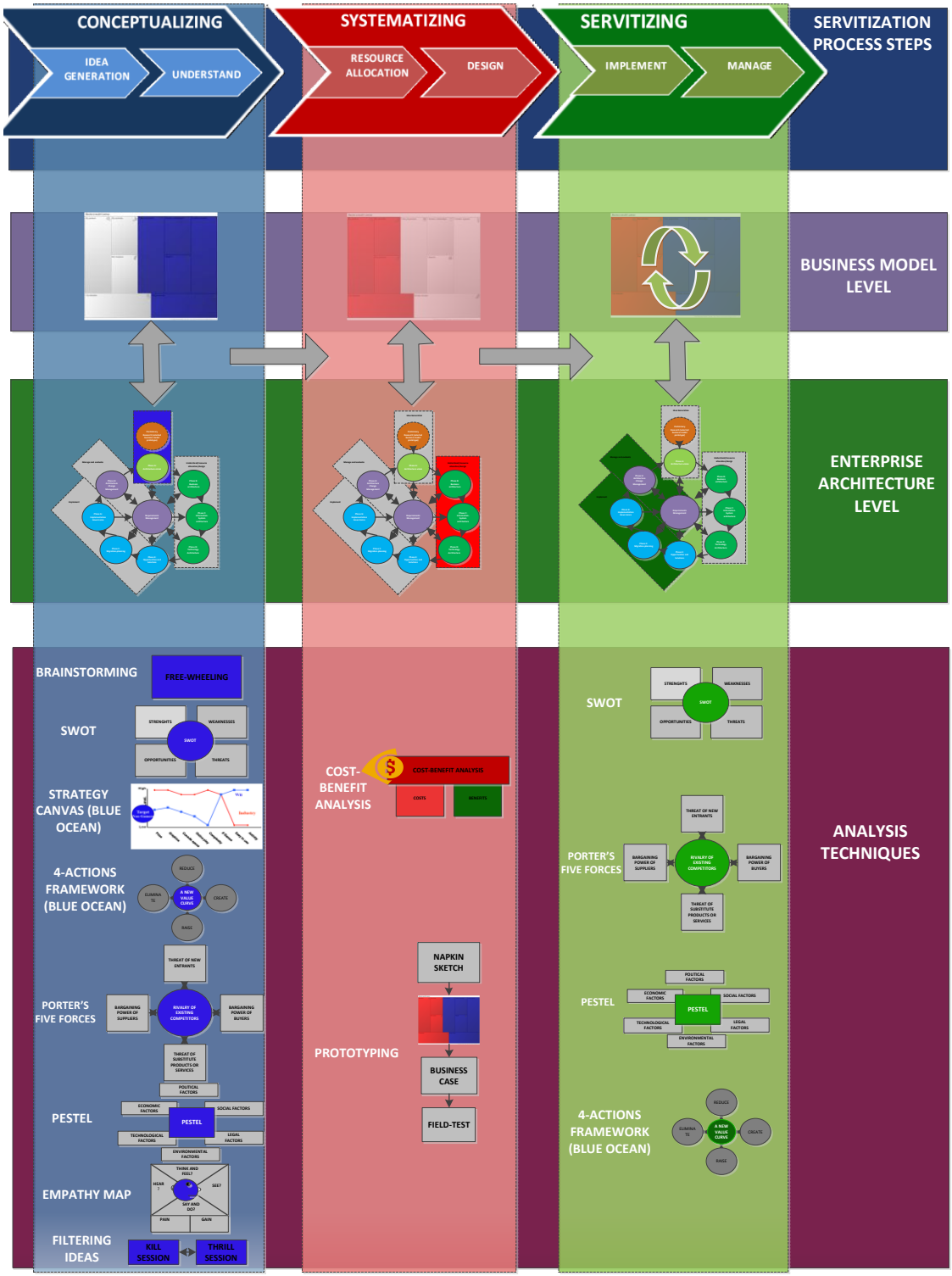
So, it is important to evaluate the business model. An evaluation of the business model can be performed by an environmental scanning of external forces (Porter's Five Forces or PESTEL), but the external forces can be analyzed from inside out. Analyzing from the inside out, the organization can provide a checklist for assessing the business model's strengths,

weaknesses, opportunities, and threats (SWOT) and to help to evaluate each Building Block. Beware, a weakness in one Building Block, for example, may have consequences for one or several other Building Blocks. When there are some changes should be made, the whole process should be followed from the beginning ("conceptualize" to "servitize"). Furthermore, the 4 Actions Framework can make useful adaptations to product-service systems, for example some waste what should be eliminated.

Step 6: "Manage"	
Roles	*(product and process) Manager(s), R&D, Service Engineer(s), Work Floor Employees, Potential Customers, Domain Experts, Process Engineer(s), Architect(s),*
Objectives	*Evaluate, monitor, adapt and modify the business model in response to market reaction*
Inputs	Fully implemented business model that conforms to the architecture
Tasks	Set up management structure to continuously monitor, evaluate, and adapt or transform the business model
Outputs	Monitor, evaluation, adaptation or transformation of the business model conforms to the architecture
Methods/techniques	*TOGAF ADM with ArchiMate (Architecture Change Management and Requirements Management)* *Porte's Five Forces or PESTEL (external)* *SWOT on business model* *4 Actions Framework*

4.4. Chapter Conclusion

To perform a model-based approach we combined three innovation methods found in literature: The model of Grönroos (2007), which highlights a three-stage approach to develop a new offering with service delivery. The other model is the business model innovation process of Osterwalder & Pigneur (2009). And the third model, the seven service innovation process steps of Flikkema et al. (2010). The best elements out of these existing process models are combined to provide a new own servitization process model. The figure below depicts an overview of the servitization process in main and detail steps, on business model level and enterprise architecture level, added with relevant analysis techniques. The TOGAF ADM process what is recommended in this model-based approach is not described in detail, because the scope of this research project then would be too broad. So, this model-based approach is basically based on business model level, and not in depth on EA level. The table below depicts an overview of the roles, objectives, input, tasks, output and methods/techniques that could be used during the several steps to servitize.


CONCEPTUALIZING
IDEA GENERATION
UNDERSTAND
SYSTEMATIZING
RESOURCE ALLOCATION
DESIGN
SERVITIZING
IMPLEMENT
MANAGE
SERVITIZATION PROCESS STEPS
BUSINESS MODEL LEVEL
ENTERPRISE ARCHITECTURE LEVEL
BRAINSTORMING
FREE-WHEELING
SWOT
STRENGHTS
WEAKNESSES
OPPORTUNITIES
THREATS
STRATEGY CANVAS (BLUE OCEAN)
4-ACTIONS FRAMEWORK (BLUE OCEAN)
REDUCE
ELIMINATE
A NEW VALUE CURVE
CREATE
RAISE
PORTER'S FIVE FORCES
THREAT OF NEW ENTRANTS
BARGAINING POWER OF SUPPLIERS
RIVALRY OF EXISTING COMPETITORS
BARGAINING POWER OF BUYERS
THREAT OF SUBSTITUTE PRODUCTS OR SERVICES
PESTEL
POLITICAL FACTORS
ECONOMIC FACTORS
SOCIAL FACTORS
TECHNOLOGICAL FACTORS
LEGAL FACTORS
ENVIRONMENTAL FACTORS
EMPATHY MAP
THINK AND FEEL?
HEAR
SEE?
SAY AND DO?
PAIN
GAIN
FILTERING IDEAS
KILL SESSION
THRILL SESSION
COST-BENEFIT ANALYSIS
COSTS
BENEFITS
PROTOTYPING
NAPKIN SKETCH
BUSINESS CASE
FIELD-TEST
SWOT
PORTER'S FIVE FORCES
PESTEL
4-ACTIONS FRAMEWORK (BLUE OCEAN)
ANALYSIS TECHNIQUES

Step 1: "Conceptualizing"		
	Idea generation	**Understand**
Roles	*Work floor employees, Sales, Marketing, Consultants and Potential Customers*	*(product and process) Manager(s), R&D, Service Engineer(s), Work Floor employees, Potential Customers, Domain Experts, Sales and Marketing*
Objectives	*Prepare for a successful business model design project*	*Research and analyze elements needed for the business model design effort and selection of ideas*
Inputs	*Strategic, economic, environmental rationales*	*Raw ideas, objectives*
Tasks	*Frame project objectives, test preliminary business ideas, plan assemble team, brainstorm session*	*Scan environment, interview experts, study potential customers, and collect ideas and opinions, filtering of useful ideas.*
Output	*Raw ideas, objectives*	*Understanding of the environment and the customer, selection of ideas*
Methods/ techniques	*Present situation: SWOT, Porter's Five Forces, PESTEL, Desired situation: Brainstorming session, Strategy Canvas, 4 Actions Framework and kill-thrill-session*	*Environment: PESTEL, Porter's Five Forces, SWOT Customer: Empathy map Brainstorming kill-thrill-session*
Step 2: "Systematizing"		
	Resource allocation	**Design**
Roles	*(product and process) Manager(s), R&D, Service Engineer, Work Floor Employees, Domain Experts, Sales and Marketing, Key Partners*	*(product and process) Manager(s), R&D, Service en Process Engineer(s), Work floor employees, Domain Experts, Architect(s), Controller/Accountant*
Objectives	*Research and analyze the resources elements needed for the business model design effort*	*Generate and test viable business model options, and select the best*
Inputs	"The value"of the servitization (the right hand-side of the Canvas): VP, CS, CH, CR and R$, few ideas	*Information and ideas, architecture vision*
Tasks	Resource investigation (financial, customers), analyzing cost and benefit (listing stakeholders, predict outcome, calculating NPV)	*Business model inquiry, selecting most satisfactory business model design, developing architecture at three levels (business, information system and technology)*
Output	Insights in the financial aspects (cost and benefits), key partners, and personnel needed, 2-3 ideas	*Elaborated Canvas on one idea , development of the business, information and systems technology architecture*
Methods/ techniques	*Cost-benefit analysis*	*Prototyping, TOGAF ADM with ArchiMate (Business Architecture, Information System Architecture and Technology Architecture)*

Step 3: "Servitizing"		
	Implement	**Manage**
Roles	*Process engineer(s), Domain Experts, Architect(s)*	*(product and process) Manager(s), R&D, Service Engineer(s), Work Floor Employees, Potential Customers, Domain Experts, Process Engineer(s), Architect(s),*
Objectives	*Implement the business model prototype in the field*	*Evaluate, monitor, adapt and modify the business model in response to market reaction*
Inputs	*Elaborated Canvas , Development of the business, Information and systems technology architecture*	Fully implemented business model that conforms to the architecture
Tasks	*Implementing the selected business model design, developing detailed Implementation and Migration Plan, Provide architectural overview for the implementation*	Set up management structure to continuously monitor, evaluate, and adapt or transform the business model
Output	*Selected business model is implemented and architecture overview*	Monitor, evaluation, adaptation or transformation of the business model conforms to the architecture
Methods/ techniques	*TOGAF ADM with ArchiMate (Migration Planning and Implementation Governance)*	*TOGAF ADM with ArchiMate (Architecture Change Management and Requirements Management)* *Porter's Five Forces or PESTEL (external)* *SWOT on business model* *4 Actions Framework*

CHAPTER 5: VALIDATION OF THE MODEL-BASED APPROACH

This chapter will discuss the collected data of the interviews and the validation workshop. Moreover, the type of qualitative interviews is highlighted and how our own designed model-based approach of chapter four is validated.

5.1. DATA COLLECTION

The data collection steps include setting the boundaries for the study, collecting information through unstructured or semi-structured observations and interviews, documents, and visual materials, as well as establishing the protocol for recording information (Creswell, 2009).

According to Creswell (2009) there are four basic data collection techniques, namely observations, interviews, documents and audio-visual materials.

5.1.1. DOCUMENTS

One type data collection used in this research is documents. The options within this type used are public documents, such as minutes of meeting, websites or newspapers. Another option is private documents, such as journals or whitepapers and other information of BiZZdesign. This type has also its advantages and its limitations (Creswell, 2009).

Documents enable a researcher to obtain the language and words of participants. It can be accessed at a time convenient to the researcher- and it is an unobtrusive source of information. Besides as written evidence, it saves a researcher the time and expense of transcribing (Creswell, 2009).
However, this type of data collection has also its limitations. Not all people are equally articulate and perceptive; it may be protected information unavailable to public or private access. It also requires the researcher to search out the information in hard-to-find places and requires transcribing or optically scanning for computer entry. Moreover, the materials may be incomplete and the documents may not be authentic or accurate.

When reading scientific articles, a lot of literature about “servitization” and other scientific articles and books were found. The most literature was found via Scopus, Web of Science and Google Scholar.

To retrieve relevant literature about this topic, several keywords were used, also used in different combinations.

- Servitization;
- Service delivery process;
- Product-oriented companies;

- Service-oriented companies;
- Service management;
- Change Management;
- Business modeling;
- Architecture modeling;
- Product models;
- Product-service system;
- Business models.

When searching with these keywords and also in different combinations a lot of literature was found. To filter some literature, keywords were used in searching in the title and the abstract. Besides number of times cited was taking into account. To retrieve the latest insights about this topic, articles published in 2011 are filtered.

5.1.2. Qualitative interviews + Audio-Visual materials

In this research one qualitative interview is taken at the Wageningen University with Frank Bakema. Furthermore, two semi-structured conversations with Remco Blom (BiZZdesign) and Timber Haaker (Novay) occurred. To get a clear overview about how companies experience the servitization transition, experts in this field are interviewed.

To obtain a clear view of the servitization process of servitized companies, the following aspects are discussed - how they think about servitization; what factors are important to make a transition to a service oriented company; what challenges they are confronted with or expect during the transition, the business models they used, what best practices they recommend and the companies will be included in the validation of the model-based approach. Hence, the interviews are qualitative. The qualitative interview is one of the most important data gathering tools in qualitative research, yet it has remained an unexamined craft in IS research (Meyers & Newman, 2007).

In a qualitative interview the researcher conducts face-to-face interviews with participants, interviews participants by telephone, or engages in focus group interviews, with six to eight interviewees in each group. These interviews involve unstructured and generally open-ended questions that are few in number and intended to elicit views and opinions from the participants. (Creswell, 2009, p. 181). This research performed one qualitative interview with Frank Bakema of the Wageniningen University and two semi-structured conversations. To make the interview more fluent, and not disrupted by making a lot of notes, the interview is recorded. The information of the interview is recorded by audiotaping. The advantages of this type of interviews are useful when participants cannot be directly observed, when participants can provide historical information and allows the researcher control over the line of questioning (Creswell, 2009). However this type of interviewing has also its limitations. It provides indirect information filtered through the views of interviewees, it provides information in a designated place rather than the natural field setting. Besides the researchers' presence may bias responses and not all people are equally articulate and perceptive (Creswell, 2009).

5.1.3. TYPE OF QUALITATIVE INTERVIEWS

According to Fonatana & Frey (2000) there are various types of qualitative interviews. Some of these are as follows: "

" (a) **Structured interview.** In a structured interview there is a complete script that is prepared beforehand. There is no room for improvisation. These types of interviews are often used in surveys where the interviews are not necessarily conducted by the researcher.

(b) **Unstructured or semi-structured interview.** In an unstructured or semi-structured interview there is an incomplete script. The researcher may have prepared some questions beforehand, but there is a need for improvisation. The interviewer is the researcher or is one of a team.

(c) **Group interview.** In a group interview two or more people are interviewed at once by one or more interviewers. This type of interview can be structured or unstructured." (Meyers & Newman, 2007, p. 4)

Group interview (validation workshop)

The next step to validate the research model is performing a validation workshop. In this workshop the model-based approach will be applied on a case. The model-based approach is tested on the case Philips Lighting. Philips Lightning sells no lamps anymore, but sells complete lighting plans. See below for more information about this case, see the appendix for a more extended version.

Case research is a method of intensively studying a phenomenon over time within its natural setting in one or a few sites. Multiple methods of data collection, such as interviews, observations, prerecorded documents, and secondary data, may be employed for deriving rich, detailed, and contextualized inferences about the phenomenon of interest. The objective of the workshop is to validate the own designed model based approach. This approach is based on scientific articles and books in the service literature. This approach should support a product-oriented company, which considers a transition to become more service-oriented. The workshop was interactive, and created space for comments and discussion by/with the participants. This workshop was in Dutch.

The design of the workshop consists of three parts, which correspond to the three main steps of my model-based approach. First, I gave a short presentation about the phenomena "servitization" and a general explanation of the approach. Subsequently, we discussed each step separately, based on a case which is send to the participants before the start of the workshop. After giving a concrete explanation of the first step, the participants elaborated this step. Several techniques, which are discussed, are the Business Model Canvas, Porter's Five Forces, SWOT-analysis, etc. When this step is fully conducted by the participants, the results will be evaluated. The other two main steps will be discussed on the same manner.

At the end of the workshop, there was time for a discussion about the relevant model based approach. What can be improved? Is it user-friendly? What are the advantages and disadvantages of the approach?

Unstructured interview

The type qualitative interview that is used in this research is the unstructured or semi-structured interview, because some interview questions are prepared beforehand and there is not a complete script beforehand. There is a need for improvisation, because the experts who are interviewed have experienced different challenges in the shifting process. Hence, it is possible that new questions arise in the interview. The interviews are not coded, it is more or less a conversation and the number of interviews are not high. These interviews will function to obtain practical feeling of the servitization process, and will give some last evaluation on the model-based approach, after the validation workshop. The interview structure and questions are added in the appendix, and is more a less a guideline for asking questions.

5.2. VALIDATION

Qualitative validity means that the researcher checks the accuracy of the findings by employing certain procedures, while qualitative reliability indicates the researcher's approach is consistent across different researchers and different projects (Creswell, 2009). There are according to Creswell (2009) several validation strategies. To ensure the internal validity, the following strategies will be employed:

- *Triangulation of data* – Data will be collected through multiple sources to include interviews, workshop, observations and document analysis. Sources as scientific articles, books, and internet pages are used.
- *Member checking (Creswell, 2009)*- The research use member checking to determine the accuracy of the qualitative findings through taking the final report to participants and determining whether these participants feel that they are accurate. So, this will take place after the validation workshop.
- S*pend prolonged time in the field (Creswell, 2009)* - There is developed an in-depth understanding of using business models through the participants. The participants have a lot of experience with the actual setting, and therefore the findings will be more accurate.

5.3. DATA ANALYSIS

In this paragraph the collected data of the validation workshop and the interviews are analyzed.

5.3.1. VALIDATION WORKSHOP

Friday, June 22th, a validation workshop was held. This workshop was attended by four experts in the field of business modeling. The participants have a lot of research experience with business modeling and therefore the relevant knowledge to validate the model based approach. The participants represented two companies, BiZZdesign and Novay. The experts

of BiZZdesign were: Henk Jonkers and Dick Quartel. The experts of Novay were: Lianne Bodenstaff and Timothy Sealy.

The workshop started with a presentation to introduce servitization. Subsequently, the Philips Lighting case and the model-based approach that should support the servitization process were explained, as well as the relevant analysis techniques. Overall, the experts' opinion about the model-based approach was positive. They argued that the approach is a useful approach for product-oriented companies which considers to become more service driven. An impression of the workshop is highlighted and an own elaboration of the Philips Lighting case is given in the next session. The Philips Lighting case is described below, see the appendix for a more extended version.

Validation workshop case: Philips Lighting

Koninklijke Phillips Electronics – Lighting Plan

Company profile

"Philips Lighting is the global leader in energy-efficient, customer-centric lighting solutions, driven by strong innovation. In a rapidly evolving but exciting marketplace full of opportunities, we will transform our business model and boost growth, profitability and return on invested capital by implementing the Accelerate! transformation, which is targeted at improving customer intimacy, time-to-market, and end-to-end business excellence." (Frans van Houten, acting CEO Philips Lighting",Philips.com)

"New market?"

The last years Philips has transformed his more product-driven strategy to a more service-driven strategy. They sell not only lamps, but they sell complete "lighting plans", the lamps are merely incidental. The lighting plans of Philips are related to projects for inside and outside use. Examples inside: office lighting, toilet lighting, school lighting. Examples Outside: Billboards, outdoor lighting, parking garage lighting, façade lighting, etc.

What does Philips Lighting offer?

"Invest in Philips Lighting with Philips Lighting Capital and uses your available budget for other objectives" .

Philips Lighting Capital is an attractive option in the purchase of a lighting project. The client saves more money with the lower energy cost, and therefore the amount of money the client should pay for it monthly is much lower. Besides the client should not make a big initial investment for the lighting project.

See the appendix for a more extended description of the case Philips Lighting in Dutch.

5.3.2. RESULTS VALIDATION WORKSHOP:

Step 1: Idea Generation

In the first step "idea generation" the participants share the opinion that it may be useful to apply the "Blue Ocean" strategy, which is a way to find a new value proposition. It is confusing to start with a SWOT on the new product-service system; first the new idea should be devised.

Before starting step 1 about the new value proposition, it would be useful to perform a SWOT, PESTEL and Porter's Five Forces analysis on the present situation. Starting with a SWOT about the present situation, the weaknesses and threats can give some opportunities in the product-service area. So, it is necessary to get a clear overview about the present situation before starting the conceptualizing phase about the desired situation.

In the first step, the participants mentioned that the following roles are necessary in this step: sales, marketing, consultants and clients. The involvement of clients is essential, because the participants and the literature mentioned that "product-service thinking" is reasoning from the clients' perspective. The participants emphasize the need of making use of clients in the first two steps (Idea generation and Understand).

Step 2: Understand

The second step "understand" is to understand the new idea, the client and the environment. So, roles those are located in the immediate vicinity, for example suppliers and clients should be present. Timothy Sealy mentioned that the "Customer Canvas" is a technique to reason from clients perspective, in fact this is more or less the same as Osterwalders' Empathy Map. All the participants mentioned that the analysis technique the "Empathy Map" is a good way to understand the client. However, understanding the client should also be done in the first step, so the Empathy Map should also be used in the first step. They mentioned that it is also useful to let the client fill in the empathy map, in dialogue with the other roles that are present in the first step.

Furthermore, Lianne Bodenstaff mentioned that the role of the R&D in the second step will be useful, not in the first step. The other participants agreed with this recommendation. Domain experts are recommended roles instead of R&D people in step 1.

Step 3: Resource allocation and Step 4: Design

In the third step "resource allocation" roles such as a controller and accountant is not helpful. However, in the fourth step "design" these roles are useful to complete a business case. Working on a business case can be done for several ideas. However, the output of the design phase should be one idea, then you can continue with the next step: "implement".

General comments

The participants mentioned that the use of the analysis techniques is depending on the stadium of the process step. A logical first step is to sketch the present SWOT, Porter's Five Forces and PESTEL. Second, a brainstorming should be planned to get raw ideas about a

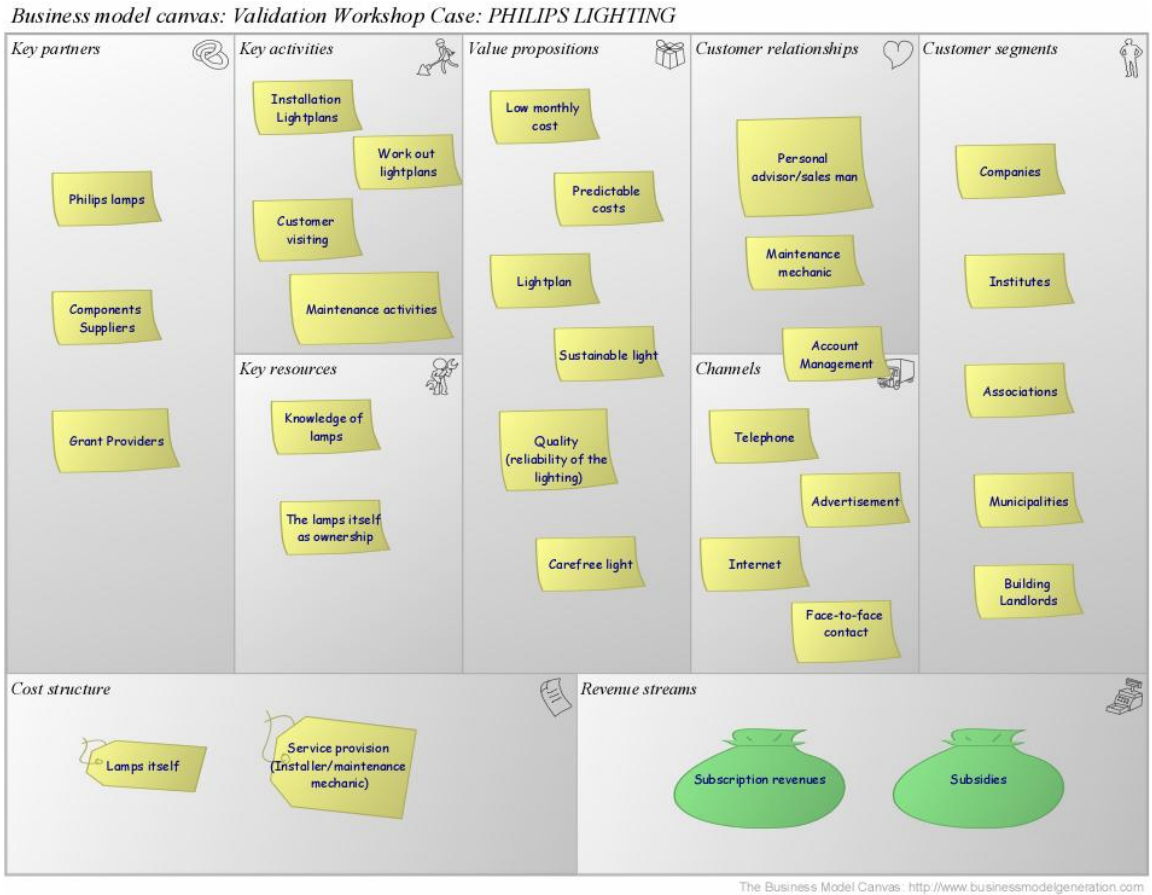
new product-service system. The participants did not proposed any type of brainstorming techniques. The participants recommended to do research for a good brainstorming technique. Third, the "kill-thrill"- session will be of great value, which is also a brainstorming technique. In this session the amount of raw ideas can be filtered to, for example, five ideas. With these five ideas the whole servitization process can be continued. In a later stadium, when the Business Model Canvas is more filled in, a new "kill-thrill" session will be useful. The participants mentioned that the Business Model Canvas is a good starting point to do a "kill-thrill"-session, to make another filtering of the five ideas. The Business Model Canvas is the common thread of the "servitization process". when information is available, for example, about the supplier, this information can be added to the Canvas. So, during the "servitization process" the Business Model Canvas is used next to the other analysis techniques.

Furthermore, the participants mentioned that it would be useful to have it clear when you completed a step. So, what aspects/activities should be finished to continue the next step?

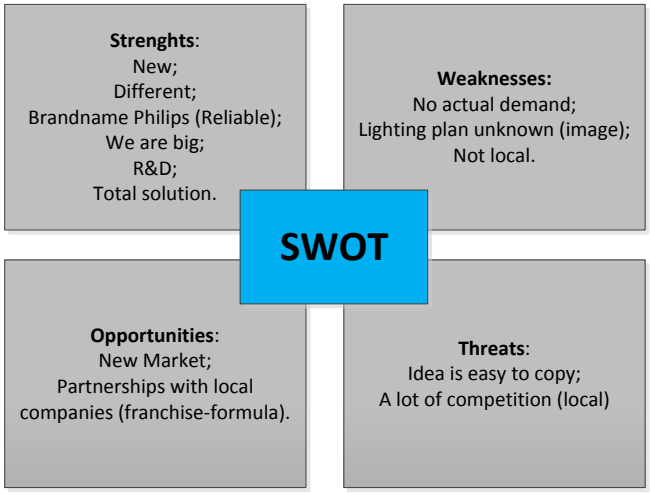
Elaboration of Analysis techniques + Business Model Canvas on Philips Lighting Case
This paragraph provides an overview of the elaboration of the analysis techniques and the Business Model Canvas applied on the Philips Lighting case. An elaboration of this case in Dutch is added in the appendix.

In the "conceptualizing" step, ideas for a new value proposition are generated, relevant customer segments are identified, together with the delivery channels and ways to maintain customer relationship and ways to generate revenues. Actually, the right-hand side of the Business Model Canvas (colored blue) of Osterwalder & Pigneur (2009) can be used to document the results of this. So, this step refers to changes in value proposition (VP), customer relationships (CR), channels (CH) and customer segments (CS) and revenue streams (R$).

In the "systematizing" step, the key activities are discussed, key partners and resources are identified and the ways the costs are structured. Actually, the left-hand side of the Business Model Canvas (colored red) of Osterwalder & Pigneur (2009) can be used to document the results of this. So, this step refers to changes in key partners (KP), key activities (KA), key resources (KR) and cost structure (C$). See the figure stated below.

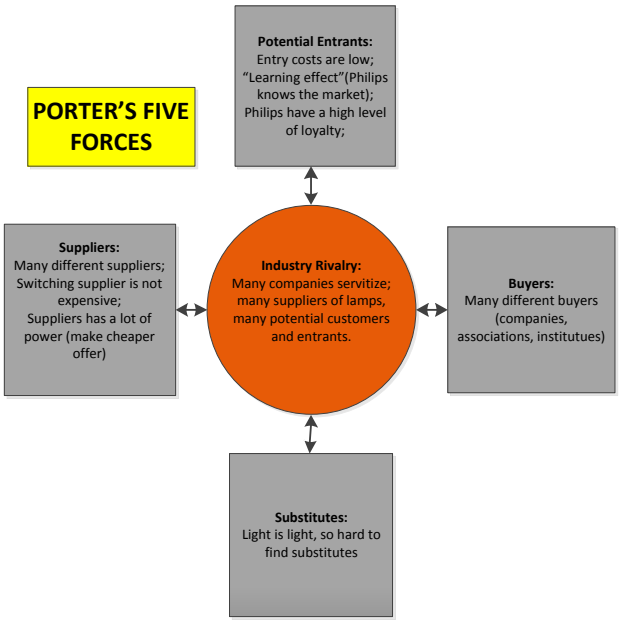


After this session, it is time to specify the objectives of this project identifying the internal and external factors that are favorable and unfavorable to achieve that objective. There is a strategic planning method to evaluate Strengths, Weaknesses, Opportunities and Threats **(SWOT).** See the figure stated below.

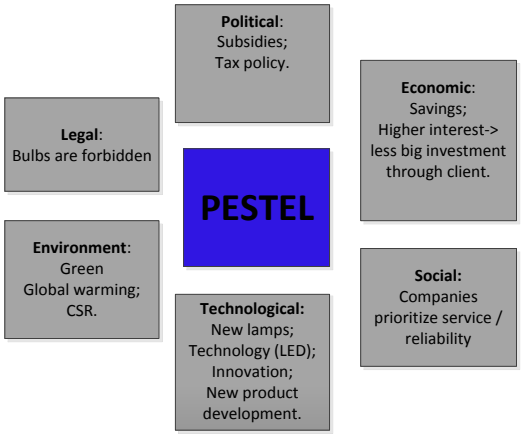


Another possible technique is **Porter's Five Forces analysis**; this analysis is more focused on the competitive element and is in fact a competitor analysis. Porter's Five Forces is a strategic marketing model, which the company is capable to tune the company on the

attractiveness on the market. Porter's Five Forces give a good indication of the relative attraction of the industry. And in the case of servitization, how can you be distinctive with respect to the competitor. See the figure stated below.

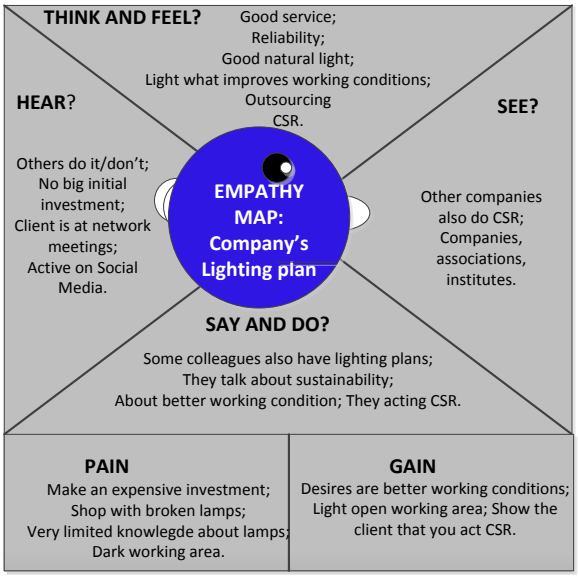


There are useful techniques to give an insight into the environment. Environmental scanning can be defined as 'the study and interpretation of the political, economic, social and technological events and trends which influence a business, an industry or even a total market' (Kroon, 1995). To scan the environment on a macro level, the **PESTEL analysis** can be used, and is a more general scanning method. These external factors indirectly affect the organization, but cannot be controlled by the organization. PESTEL analyze the following factors: Political, Economic, Social, Technological, Environment and Law. See the figure stated below.

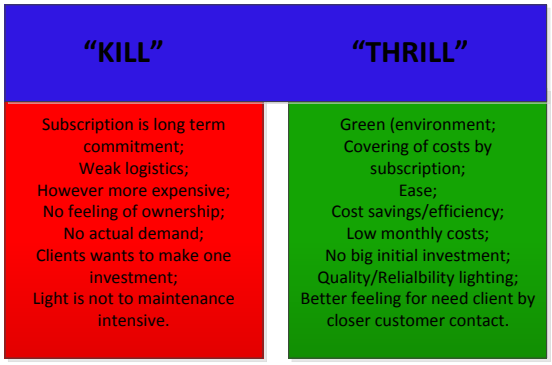


Subsequently, it is crucial to scan the customer. A useful method to scan the customer is the **Empathy Map,** a tool developed by visual thinking company XPLANE. Using this method, it allows you to devise a stronger business model, because a customer profile guides the

design of better VP, more convenient ways to reach customers, and more appropriate CR. This is really important in the case of servitization, because the company should be more "customer centric" (Atos Consulting, 2011). Ultimately, it allows you better to understand what a customer is truly willing to pay for (Osterwalder & Pigneur, 2009). The six questions in this empathy map are (in the eyes of the customer): What does she see?; What does she hear?; What does she really think and feel?; What does she say and do?; What is the customer's pain?; What does the customer gain?. Customers profiling enables you to generate better answers to questions such as: Does this VP solve real customer problems? Would she really be willing to pay for this? How would she like to be reached?



It is useful to organize a ***kill/thrill session.*** In this session all participants are tasked with **brainstorming** for 20 minutes on reasons why the idea won't work ("the kill portion"), then spend 20 minutes brainstorming exclusively on why the idea will fly (the "thrill" portion). The ideas that you now have generated, can be filtered and to a few ideas.



5.3.3. INTERVIEWS

This research had some unstructured conversations with experts Timber Haaker (Novay), Remco Blom (BiZZdesign) and Frank Bakema (Wageningen University). These interviews functioned to obtain practical feeling of the servitization process, and will give some last evaluation on the model-based approach, after the validation workshop. The interview structure and questions are added in the appendix, and is more a less a guideline for asking questions. It was basically a conversation to get feedback about the model-based approach.

We give a summary of the most important findings of these unstructured interviews. Before these interviews has taken place, the model-based approach is send to the interviewee, to create a content-wise conversation, and a minimal lose of time to explain the model-based approach. For the elaboration of the interview with Frank Bakema, see the appendix.

Surprisingly, the analysis techniques used in my model-based approach are not used in practice (Conversation Bakema & Blom, 2012). Frank Bakema knows the techniques but did not use them, but he agreed that a variation of use of these techniques will help the creativity of participants and will pull them out of the "comfort"-zone.

Furthermore, Frank Bakema and Remco Blom were very positive about the use of the Business Model Canvas. Frank Bakema said: "The Canvas is very easy to understand, everybody can participate to fill in such business model".

The overall opinion about the model-based approach by Haaker, Blom and Bakema is unanimous. The distinctive steps to servitize, analytical seen, are mapped very well. This approach is from great value because of the clear roles, tasks, inputs, outputs, techniques that are needed during the steps. This helps really good, to structure this process, and therefore contribute to an useful support. Furthermore, the analysis techniques, business models and architecture are good related with each other and are from great added value for this research project.

CHAPTER 6: CONCLUSION AND DISCUSSION

In this final chapter the research questions will be answered. Moreover, the limitations of this research are presented, suggestions will be made with regard to further research and recommendations to BiZZdesign are nominated.

6.1. CONCLUSION

Many organizations that traditionally offer (physical) products are currently extending their business to value-adding services. In this context, "*servitization"* means that organizations try to find an optimal combination of products and services to generate income. There are several reasons or drivers for manufacturing companies to servitize. These are economic, environmental and a competitive (strategic) drivers.

Roland Berger Consulting (2009) mentioned that the EBIT margin on services is three to seven times higher. Despite being a very lucrative strategy, servitization seems to be problematic to implement and the implementation hurdles can even decrease overall financial performance of the firm.

In the academic literature, several definitions of "servitization" are used, but none of them are complete and clear definitions, which embraces the whole scope and relevance of servitization. Therefore, we formulated the following definition, which is based on the definition of Visjnic (2010) and Ren & Gregory (2007), Neely (2008) is as follows:

"Servitization is a business model innovation wherein manufacturing companies embrace a service orientation and expands the scope of transactions with customers by offering product related services and, hence more encompassing solutions, with the aim to satisfy customer needs, enhance the firm's performance and achieve competitive advantages".

In this conclusion, answers to the main research question and several subquestions are suggested. This corresponds directly to the structure of this conclusion paragraph.

Neely et al. (2011) mentioned that we still need to understand much better the transformation to services, especially in terms of business models that best enable manufacturers to create and capture value through the provision of services. So, organizations are considering servitization, but guidance from a professional with know-how about this transition will be of great added value. The main question of this research is as follows:

(MQ): "To what extent can a model-based approach support product-oriented companies to make a transition to a service-oriented company or a combined product- and service oriented company?"

To achieve a clear answer on this main question, some sub questions are composed.

(SQ1). What are the challenges that organizations are confronted with when transforming from being "product-oriented" to being a "servitized" organization?

The servitization process is not easy, there are a lot of challenges and barriers to overcome, haphazardly conducting this process is doomed to fail. There is evidence that the number of bankruptcies among servitizing companies seems to be higher than average (Atos Consulting, 2011). Martinez et al. (2010) mentioned that key issues in categories of servitization challenges are embedded product-service culture, delivery of integrated offering, internal processes and capabilities, strategic alignment and supplier relationships. Baines et al (2007) mentioned there is a need for a shift from "product thinking" to "system thinking". Because the design of services is significantly different to the design of products, since services are fuzzy and difficult to define (Slack, 2005). Furthermore, companies need to take into account competition from outside the usual domain like their own, such as suppliers, distributors and customers. In addition, they need to undertake new activities that were previously undertaken by customers.
Moreover, the communication strategy that clearly describes the value proposition to the customer needs to be considered in the design of the service provision. This fundamental changes will not easily be implemented in the organization (Baines et al., 2009).

The common thread in order to be able to deliver services, needs a change of the organization's strategy. The company needs to be become more customer centric (cultural change), finding the right people for the service activities is the key to make such a change successfully.

So, although servitization is an attractive option for product companies, it also raises significant challenges or severe risks, such as the new product-service culture, communication strategy, the change of internal processes and capabilities, strategic alignment en supplier relationships.

(SQ2). What modeling techniques are relevant in the context of the challenges that arises in the transformation process? And (SQ3). What types of models are necessary to specify the present and the desired situation?

Business modeling technique:

We also proposed models and techniques to support the process steps. We evaluated three business modeling techniques, Canvas, STOF and e3-value. The business modeling technique that we propose to support these steps is the Business Model Canvas. The Business Model Canvas scores at the relevant criteria in the special case of servitization ("focus on innovation", "ease of use", "material look/feel" and "support") the best. The Business Modeling techniques that should support these steps is the Business Model Canvas. The Canvas is very easy to understand and easy to explain to other, instead of e3-value and STOF. The people get excited and can almost start instantly. Besides it is a hands-on tool that fosters understanding, discussion, creativity, and analysis. In the servitization

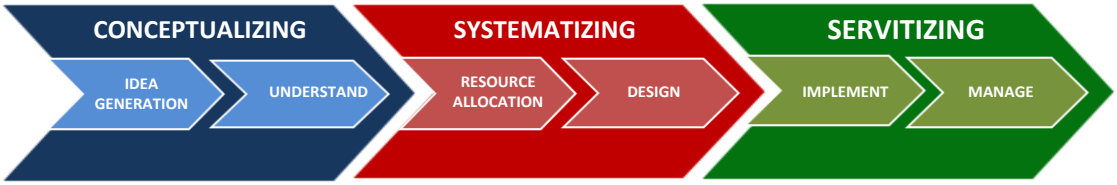
process, this a very important criterion, because almost every role in the organization is part of the process and should be able to work with this model. Furthermore, the Business Model Canvas is very well described in several books (e.g. "*Business Model Generation*" van Osterwalder & Pigneur (2010)) and on websites, therefore the availability of the material is great. The Canvas is a useful method for innovation, and therefore very applicable on the "servitization process".

Enterprise Architecture method

We evaluated three enterprise architecture methods, TOGAF, DYA and Zachman. TOGAF scores at the relevant criteria in the special case of servitization the best. The EA method that we propose to support these steps is TOGAF. TOGAF and Zachman were very close, but the criteria "practical" and "support for the development of EA at product and person" are decisive. Especially in the case of servitization, because several roles in the company participate in this process. Now, architects can make their work understandable and accessible for managers and other roles in the organization. Furthermore, the Business Model Canvas provides an interface to communicate between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAF and ArchiMate (Jonkers, Quartel & Blom, 2012). However, a business model in isolation does not make a successful business: the step towards implementation of the business model is crucial. The Business Model Canvas provides an interface for the communication between strategists, decision makers and architects, and a starting point for the development of the enterprise architecture using TOGAFADM process and ArchiMate (Jonkers, Quartel & Blom, 2012). With such an approach it becomes possible to assess, at strategic level, the global balance between costs involved in the architecture change and the one may expect of it.

(SQ4). How can an organization make the transformation to the desired situation?

There are several process models and modeling techniques that can support the servitization process, and are therefore of great value. The method that we propose to guide the organization in the servitization process is as follows, and is based on Grönroos (2007). The main process steps are conceptualizing, systematizing and servitizing. These steps are too general, therefore we made a more detailed process. These more detailed steps are based on the service innovation process of Flikkema et al. (2008) and the business model innovation process of Osterwalder & Pigneur (2010). The best elements out of these existing process models are combined to provide a new own servitization process model. This resulted in the following (detailed) steps to servitize:



SQ5). What are relevant criteria to validate the proposed method according to recent research and/or experts/practitioners?

Out of our design cycle, we can conclude that there is a great need for an accessible tool to identify value of servitization. As noted before, in the special case of servitization, the following criteria are particularly relevant, based on literature and expert/practioners:

- *Practical* (Not only a great academic foundation is a pre, the approach should also be useful in practice);
- *Material look/feel/ease of use* (Several roles in the company who participate in this process, should understand the techniques and tools);
- *Focus on innovation* (Servitization is a business model innovation process, so a very important criterion);
- *Relation business model technique and EA-method* (The Business Model Canvas is a good starting point to develop a new enterprise architecture).

Several experts are qualitative interviewed, using semi-structured open-ended questions. Moreover, the proposed model-based approach is validated during a validation workshop with experts from BiZZdesign and Novay. It was a pre to participate experts who have a great common sense in the business modeling field and we suggested a minimum of four experts to acquire a good validation.

(MQ) ***To what extent can a model-based approach support product-oriented companies to make a transition to a service-oriented company or a combined product- and service oriented company?"***

The model-based approach depicts an overview of the servitization process in main and detailed steps, at the business model level and enterprise architecture level, complemented with relevant modeling and analysis techniques. Moreover, in addition to the approach a clear overview of the relevant roles, objectives, input, tasks, output and methods/techniques are suggested. According to the experts in the validation workshop, the overall opinion of the model-based approach was positive. They argued that the approach is a useful approach for product-oriented companies that wants to become more service driven. They emphasized that the customer is very important in the idea-generation step, because they are the potential customers and they have daily contact with the present product and the desired product-service system. Moreover, the complemented analysis techniques which are suggested gives a well grip to proper execution of the servitization process.

6.2. Limitations of the Research

There are also some limitations of the research:

- *NUMBER OF PARTICIPANTS AND DURATION VALIDATION WORKSHOP*

There were four participants who participated during the validation workshop. The validation is maybe more useful when more experts participated in the workshop. When more experts participated, more groups can be created, which gives more and different insights. With more participants, there are more opinions, and therefore more discussion, which lead to a better evaluation of the model-based approach.

The duration of the workshop was beforehand scheduled for two hours. In practice this was really not enough to discuss fully all six detail steps. In particular, the first four steps received the most attention. It was better to take more time for each step, and so each step gets an equivalent evaluation. However, the first four steps entails analysis techniques that are hands-on techniques and therefore takes time to fill in. Instead of step five and six, these steps are more steps with aspects to think of and the use of TOGAF ADM Process is recommended during the servitization process. This TOGAF method is not described in depth.

- *NUMBER OF QUALITATIVE INTERVIEWS*

The number of qualitative interviews of this research was not very high. The validation quality increases, when the amounts of qualitative interviews are higher. Hence, the results would be better generalizable. In addition, there have some unstructured conversations taken place with Timber Haaker from Novay and Remco Blom from BiZZdesign. They are also experts in the field of business modeling. Moreover, Timber did a research at Novay about “servitization”.

- *INDUSTRY-VARIATIONS*

The model-based approach is only discussed at some companies, which are typical for two different industries. It would be better to discuss the servitization process in companies in different industries. It would also be of great value to look to the differences and similarities of the servitization process between the industries (validation workshop).

- *SCOPE OF THE RESEARCH*

The model-based approach is described in depth at business model level and some relevant analysis techniques are recommended. The enterprise architecture level and its relation to business models is not discussed in depth. It was maybe better to get a clear picture of the whole package. So, a clear view at business model and enterprise architecture level and the relation to these two levels will be of great value.

- *CASE STUDY*

This research is based on a single case study, The Philips Lighting case, what is a limitation of the research. Hence, the possibility to generalize is restricted. It would be better to perform a multiple-case study.

6.3. Recommendations & Further Research

To achieve a good implementation of the new business model, it is critical to have a clear relation between the business model level and the architecture level. This model-based approach provides a good basis to make the coupling to the enterprise architecture level, but the implementation phase should be described at a more detailed level.
This model-based approach is only validated by some experts with know-how in the business model and enterprise architecture field. It will be helpful to also test this model based approach with domain experts from the field, as guidance for companies that wants to be more service-driven. Before testing, a multiple case study will be of great value.

There is some paucity in the literature relating the ArchiMate and BMC concepts. This is due to the fact that in the Business Model Canvas relationships are not explicitly modeled and do not play any role. Iacob et al. (2011) mentioned also that a more extensive investigation and discussion of possible benefits of relationship-mapping between the two languages, for instance, for analysis techniques or for BM generation, must be still carried out.

The model based approach needs to be validated for companies that have undergone servitization over the long-term. This might also be enable a better understanding of the implications of servitization on company's stakeholders, such as it employees, customers, suppliers and shareholders.

Moreover, the shift facing incumbent companies is not primarily revolutionary, but is rather incremental and emergent in character, which will make it interesting to study in which order parameters in a business model will change over time.

Furthermore, it will be helpful to do more research on the process of servitization at servitized companies. Is there a difference between approaches of servitization between the several industries?

To commercialize this approach and knowledge, it is important to benchmark. It will be very helpful to benchmark at other consultancy/training companies, e.g. how they promote their service to support companies with the servitization process. Moreover, conferences in the service management field will be of great value. Creating a network and having useful contacts are a good base to successful commercialize the relevant know-how.
Furthermore, many organizations are not yet familiar with the term "servitization". Therefore, a clear and brief explanation of the phenomena is necessary.

Concluding, a good validated model-based approach as support for companies which considers to servitize and a market who is struggling with servitization, is an unique opportunity for BiZZdesign to extend their consultancy/training offering.

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Zachman Framework:

http://davidjromano.com/djr.com/wp-content/uploads/2011/12/Zachman.gif

TOGAF content overview:

http://pubs.opengroup.org/architecture/togaf9-doc/arch/Figures/01_structure.png

CHAPTER 7: APPENDIX

7.1. LIST OF ABBREVIATIONS

ADM	Architecture Development Method
APSS	Application-oriented Product Service System
BM	Business Model
BMC	Business Model Canvas
CH	Channels
CR	Customer Relationships
CS	Customer Segments
CSS	Conceptualizing Systematizing Servitizing (model)
C$	Cost Structure
EA	Enterprise Architecture
IB	Installation Based
KA	Key Activities
KP	Key Partnerships
KR	Key Resources
PSS	Product Service System
PPPS	Product-oriented Product Service System
RS	Revenue Streams
SOM	Service-Oriented Manufacturing
UPSS	Utility-oriented Product Service System
VP	Value Propositions

7.2. INVITATION VALIDATION WORKSHOP (DUTCH)

"Servitization van product georiënteerde bedrijven"

Voorstellen workshopleader

Mijn naam is Gerben Steunebrink, en studeer af op de Master Business Administration:

track Service Management, op de Universiteit Twente. Ik voer deze afstudeeropdracht extern uit, bij Bizzdesign te Enschede.

Wat is "servitization" eigenlijk?

Steeds meer bedrijven proberen de shift van product georiënteerd naar product-service georiënteerd te maken. Servitization is het proces waarbij productgerichte organisaties hun aanbod uitbreiden met aanvullende diensten, wat een aanpassing van hun business model en bedrijfsinrichting vereist. Vandaag de dag verkopen bedrijven niet enkel het product, maar voegen lange termijn contracten toe, dat de relatie tussen leverancier en klant verlengd. De EBIT-margin op diensten is zelfs drie tot zeven keren hoger, dan enkel het aanbieden van een product. Hetgeen, op het eerste gezicht positief klinkt, maar bedrijven onderschatten het servitization proces en worstelen met het organiseren van transformatie proces.

Betrokkenen validatie workshop

De participanten van deze workshop zullen inhoudelijke kennis hebben van het Business Model Canvas. Tevens zullen ze enige affiniteit hebben met dienstverlening (service) in het algemeen. Bovendien worden er nog meerdere generieke modellen gebruikt en beschikken de participanten over een flinke dosis "common sense".

Doel en opzet validatieworkshop

Het doel van de validatie workshop, is de validatie van de modelgebaseerde aanpak die ik ontworpen heb. Deze aanpak is gebaseerd op wetenschappelijke theorieën (literatuurstudie) en verscheidene boeken in de service literatuur. Deze modelgebaseerde aanpak zal ondersteuning moeten bieden aan bedrijven die een omschakeling willen maken van product georiënteerd naar product- en service georiënteerd. Het is de bedoeling een interactieve workshop te creëren met ruimte voor opmerkingen, toevoegingen en discussie door/ met de participanten. Tevens zal deze workshop in het Nederlands gehouden worden.

De opzet van de workshop, bestaat uit 3 delen. Mijn modelgebaseerde aanpak kenmerkt 3 stappen, dit zal tevens de structuur van de workshop zijn. Ik zal "het spits afbijten" met een presentatie over het fenomeen "servitization" en ik zal een algemene uitleg geven van de modelgebaseerde aanpak. Vervolgens gaan we elke stap apart behandelen op basis van een casus, die vooraf is opgestuurd naar de participanten. Na het geven van concrete uitleg over de eerste stap, gaan de participanten aan de slag met stap 1 (verscheidene modellen zullen de revue passeren, zoals Business model Canvas, Porter, Swot, etc.). Wanneer deze stap is voldaan door de participanten, worden de uitkomsten van de stap geëvalueerd samen met de participanten. De andere twee stappen zullen allen ook op deze manier behandeld worden.

Aan het eind van de workshop is er een discussie over de behandelde modelgebaseerde aanpak. Zijn er aspecten verbeterd kunnen worden? Is het gebruiksvriendelijk? Wat zijn de voor en nadelen van de aanpak?

Behandelde casus

De casus-organisatie, is een organisatie die een omschakeling heeft gemaakt van product georiënteerd naar product- en service-georiënteerd. Deze casus zal 2 dagen alvorens de workshop verspreid worden onder de participanten.

7.3. INTERVIEW INVITATION (DUTCH)

"Servitization van product georiënteerde bedrijven"

Voorstellen interviewer

Mijn naam is Gerben Steunebrink, en studeer af op de Master Business Administration: track Service Management, op de Universiteit Twente. Ik voer deze afstudeeropdracht extern uit, bij Bizzdesign te Enschede.

Wat is "servitization" eigenlijk?

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Voorbeeld "Servitization" bij Ahold

Eind februari 2012 heeft Ahold webwinkel Bol.com overgenomen. Met overname van Bol.com werd het platform, de schaal en de expertise van online retailing versterkt. Deze dienstorganisatie heeft een zekere invloed gehad op het business model en de bedrijfsinrichting van Ahold gehad.

Soort persoon/rol bij wie interview wordt afgenomen

Het is essentieel dat de persoon/rol kennis heeft van het begrip "servitization" en een rol heeft gespeeld (of nog speelt) bij de transformatie naar een meer service-gerichte organisatie. Deze persoon zal kennis hebben van het plan dat is uitgevoerd om deze transformatie tot een succes te laten verlopen. Ideaal, zou een persoon/rol zijn die leidinggevend was/is in dit proces, die van het begin tot en met het eind hierbij betrokken was. Deze persoon/rol zal uitgebreid kunnen vertellen over de plan/aanpak van het servitization proces, uitdagingen of moeilijkheiden die ze zijn tegengekomen, de veranderingen die hebben plaatsgevonden in de bedrijfsstructuur, etc.

Doel en opzet interview

Het doel van het interview is inzichtelijk te krijgen, welke veranderingen hebben plaatsgevonden in de interne bedrijfsstructuur. Tevens is het belangrijk hoe ze dit transformatie proces hebben aangepakt, of er gebruik is gemaakt van bepaalde methodes of modellen om situaties in kaart te brengen (bijvoorbeeld CANVAS-model, STOF-model).

Na het stellen van een aantal vragen, wordt mijn modelgebaseerde aanpak gepresenteerd (gebaseerd op een literatuurstudie), en zullen we evalueren of dit een goede methode is om een transformatie te maken naar een meer service-georiënteerde bedrijf. Op deze manier zal de modelgebaseerde aanpak gevalideerd worden.

Voorbeeldvragen

Vragen die in de interview naar voren komen zijn, bijvoorbeeld:

- *Wat waren kritieke succesfactoren voor het transformeren van de organisatie naar een product-service organisatie?*
- *Wat waren de grootste uitdagingen in het transformatieproces? Hoe zijn deze uitdagingen aangegaan?*
- *Hoe werd het transformatie proces ondersteund? Was er een plan gemaakt? Zijn er business modelling technieken gebruikt? (Bijvoorbeeld CANVAS, STOF) Ging het zoals gepland?*
- *Ondersteunde het model het transformatie proces? Zo niet, wat miste je en zal je willen toevoegen?*

7.4. INTERVIEW STRUCTURE AND QUESTIONS (DUTCH)

1. Introductie

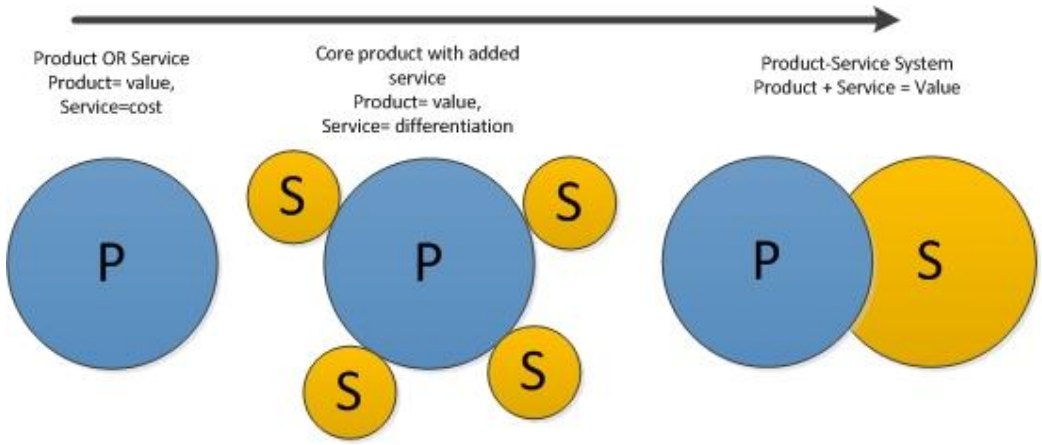


FIGURE 25: THE SERVITIZATION OF MANUFACTURING (BASED ON VANDERMERWE & RADA)

Aan de hand van het servitization proces model wordt uitgelegd wat servitization inhoudt en wordt er gekeken in welk stadium het betreffende bedrijf zich bevindt.

1. Strategie

- ***Verkennende vragen**:*

- Waarom is uw bedrijf gaan servitizeren? Wat zijn voor uw bedrijf drivers geweest voor service innovatie? Bijv: concurrentie, nieuwkomers in de markt, klanttevredenheid, extra inkomsten (Porter's vrijfkrachten model).

➢ ***Huidige situatie***

- Kunt u aan de hand van figuur 1 aangeven waar uw bedrijf zich bevindt?

➢ ***Huidige/gewenste situatie***

- Heeft u een gescheiden organisationele business unit voor de diensten? Zo ja, waarom heeft u hiervoor gekozen (met KPI's en welke?) Geeft het moeilijkheden? Als deze er niet is, is uw bedrijf van plan in de toekomst zo'n business unit op te starten?

➢ ***Gewenste situatie***

- Waar wilt uw bedrijf zich naar toe bewegen? Kunt u dit in het plaatje aangeven? Zo niet, hoe zou u het willen omschrijven?

➢ ***Transitie vragen***

- Hoe verloopt de sturing van servitization binnen uw bedrijf? Top-down of bottom-up? Wie zijn hier verantwoordelijk voor?
- Welke methoden, technieken en strategische tools worden gebruikt te ondersteuning van het servitization proces (bijvoorbeeld planning en analyse of business models zoals Canvas of STOF?) Zo ja, zijn er dingen die uw mist in deze methoden? Welke waren nuttig?
- Is er een roadmap/plan van aanpak in uw business model opgenomen dat voor de komende jaren beschrijft hoe servitization van uw diensten in zijn werk gaat? Zo ja, hoe gedetailleerd is deze roadmap en wat staat erin beschreven? Zijn er aspecten wat je hierin mistte?
- Wat waren kritieke succesfactoren bij de transitie?
- Wat waren de grootste uitdagingen in het transformatieproces?(structuur, architectuur) Hoe zijn deze uitdagingen aangegaan?

2. *Business model (stuctuur gebaseerd op STOF-model)*

Diensten (Service)

- Wat zijn de belangrijkste producten of diensten van uw bedrijf? Wie zijn uw directe concurrenten? Wie zijn uw klanten? Wat is uw markt? Wat is de rol van dienstverlening in het hele portfolio?
- Bij welke product-dienst combinaties binnen uw bedrijf is de afgelopen jaren de dienstencomponent belangrijker geworden?

Technologie

➢ **Transitie vragen**

- Op welke manier heeft ICT invloed (gehad) op de ontwikkeling van producten en diensten binnen uw bedrijf?
  - ICT ondersteunt een hoge mate van betrokkenheid van de klant in de definitie en uitvoering van diensten
  - ICT vergroot de beschikbaarheid en codificatie van informative en kennis, en maakt daardoor procesoptimalisatie, nieuwe dienstverlening en rolverschuivingen mogelijk
  - ICT heeft ten dienste van het servitization process gestaan
  - ICT maakt een sterke verfijning van diensten en dienstenkarakteristieken mogelijk
  - ICT biedt eenvoudige 'always on' toegang tot diensten en resources
- Stelt innovatie op het gebied van services nieuwe eisen aan uw ICT-architectuur? Hoe heeft u deze nieuwe eisen bepaald? Hoe zijn deze doorgevoerd?

Organisatie

➢ **Huidige situatie**

- Wat zijn de samenwerkingsverbanden die uw bedrijf heeft voor het aanbieden van diensten en hoe ziet deze samenwerking eruit? Bijvoorbeeld: customer/supplier relatie of partnerships.

➢ **Gewenste situatie**

- Met wat voor type partijen en uit welke marktsegmenten wil uw bedrijf graag samenwerken?

➢ **Transitie vragen**

- Hoe realiseert u nieuwe samenwerkingsverbanden in het licht van financiering (wie betaalt wat) en organisatie (wie doet wat)?

Financial

➢ **Huidige situatie**

- Wat is het verdienmodel van uw bedrijf, wat betreft de door u aangeboden diensten? (onderdeel van de producten, one-time revenues, recurring revenue, profit-loss responsible, etc.)

➢ **Gewenste situatie**

- Wat is het gewenste verdienmodel van uw bedrijf?

➢ **Transitie vragen**

- Hoe ziet u de ontwikkeling van het verdienmodel van uw bedrijf? Denkt u, bijvoorbeeld, dat er een verschuiving plaats gaat vinden of heeft plaatsgevonden?

3. *Operations*

➢ **Verkennende vragen**

- Zijn er nieuwe diensten ontstaan op de werkvloer die vervolgens in het service portfolio van uw bedrijf zijn opgenomen? Als dit het geval is, hoe is de ontwikkeling verlopen?

➢ **Gewenste situatie**

- Welke competencies moeten er ontwikkeld worden binnen uw bedrijf?

➢ **Transitie vragen**

- Hoe gaat uw bedrijf om met de noodzaak van uitbreiding en verandering van competencies?
    - Fysieke systemen;
    - Management sytemen;
    - Vaardigheden en kennis;
    - Bedrijfscultuur.
- Hoe voert u de noodzakelijke veranderingen op de werkvloer door?
    - Welke systemen/methods/tools/… gebruikt uw bedrijf hiervoor?
    - Hoe krijg je mensen mee in de shift (HRM aspecten)?

5. *Afsluitende vraag*

In voorgaande hebben we u vragen voorgelegd over onderwerpen rondom “servitization”. Op basis van literatuur heb ik zelf een model-gebaseerde aanpak gemaakt, die ondersteuning zal moeten geven bij het servitization proces. Zou dit een nuttige ondersteuning geven bij het servitization proces? Zijn er, voor uw gevoel, nog relevante aspecten niet aan bod gekomen, maar wel belangrijk zijn in het proces van servitization?

7.5. VALIDATION WORKSHOP CASE: PHILIPS LIGHTING (DUTCH)

VALIDATIE WORKSHOP: “SERVITIZATION”

Koninklijke Phillips Electronics - Lichtplan

Bedrijfsprofiel

Koninklijke Philips Electronics N.V. is een onderneming met een veelzijdig aanbod op het gebied van gezondheidszorg en welzijn, dat gericht is op verbetering van de kwaliteit van leven van mensen door middel van tijdige innovaties. Als toonaangevende onderneming op het gebied van **gezondheidszorg, lifestyle** en **lighting** integreert Philips technologieën en design in op de mens gerichte oplossingen (Phillips.com)

“Nieuwe markt?”

Philips heeft de laatste jaren zijn voornamelijk productgedreven strategie naar een meer servicegedreven strategie omgezet. Philips verkoopt allang geen lampen meer, ze verkopen nu ‘lichtplannen’. De lampen zijn slechts bijzaak. De lichtplannen die Phillips aanbiedt hebben betrekking op projecten binnen en buiten. Voorbeelden voor binnen:

kantoorverlichting, gangverlichting, toiletverlichting, schoolverlichting, parkeergarageverlichting, sportverlichting, industrieverlichting, etc. Voorbeelden voor buiten: gevelverlichting, reclameborden, terreinverlichting, parkeerplaatsverlichting, etc.

Wat biedt Phillips Lighting Capital nu eigenlijk aan?

"Investeren in Philips verlichting met Philips Lighting Capital en gebruik uw beschikbare budget voor andere doeleinden."

Philips Lighting Capital is een aantrekkelijke optie bij de aanschaf van een verlichtingsproject. Het is namelijk zo gestructureerd dat de klant in veel gevallen door de lagere energiekosten meer bespaart dan het bedrag dat de klant er elke maand voor moet betalen. Bovendien hoeft hij niet meteen bij aanvang van het project een grote investering te doen.

Als een medewerker van Philips Ligthing voorheen een voorstel moest doen om bijvoorbeeld een kantoorgebouw of hotel van licht te voorzien, dan sprokkelde hij de benodigde gegevens bij elkaar, uit de verschillende systemen, verwerkte deze in een Excel- of Access-bestand en maakte op die manier zijn volledige TCO-berekening (Total Cost of Ownership). Dit was een vrij omslachtige manier, waarbij de kans aanwezig was dat verouderde gegevens werden gebruikt. Een projectmanager van Philips Lighting, Jan Thijs, zei: *"Wij willen meer dan alleen lampen verkopen. We willen onze klanten helpen de juiste beslissing te nemen; onze kennis beschikbaar te stellen en daarbij op een overzichtelijke manier inzicht geven in de total cost of ownership".* Daarom heeft Philips een applicatie ontworpen, de TCOne, die de verkoper helpt direct een prospect bij de klant voor te kunnen leggen. De "TCOne is in staat de gegevens uit onderliggende SAP-systemen te halen en te gebruiken om een kostencalculatie voor het lichtsysteem op te stellen", aldus Jan Thijs. Bovendien kunnen ze met het systeem laten zien wat de milieugevolgen zijn van de keuze van een lamp en daarmee het lichtplan, wat erg handig is gezien bedrijven steeds milieubewuster aan het ondernemen zijn.

Het systeem met de rijke interface, geeft ook de mogelijkheid het lichtplan te presenteren, dat helpt de kosten te beheersen. Zo kan Philips helpen een preventief onderhoudsplan op te stellen, waardoor het (bijna) niet zal voorkomen dat er iemand in het gangpad van de winkel op een trapje moet staan, de lamp vervangen.
Kortom, het systeem houdt rekening met milieu-eisen, onderhoud en vervangingsoptimalisatie en daarmee geeft deze oplossing een voorsprong op concurrenten.

Enkele voordelen van de lichtplannen:

Lage maandlasten
Financiering van de lichtoplossingen stelt de klant in staat om direct toegang te hebben tot hoge kwaliteit licht met lage maandelijkse lasten. De klant betaalt wanneer hij gebruikt.

100% kostendekking
Philips Lighting Capital stelt de klant in staat alle kosten in één contract samen te voegen, ook 'zachte' kosten, zoals installatie en onderhoud.

Behoud van kapitaal
Financiering maakt kapitaal vrij. Doordat de lichtoplossingen van de klant voor de volle 100% gefinancierd zijn, kan de klant contante middelen of kredietruimte vrij houden voor andere investeringen, zoals voorraden of personeel om uw zaken uit te breiden.

Beter voorspelbare cashflow
Dankzij de vaste maandelijkse aflossingen kan de klant effectiever begroten en loopt de klant minder risico door inflatie of rentestijgingen in de toekomst.

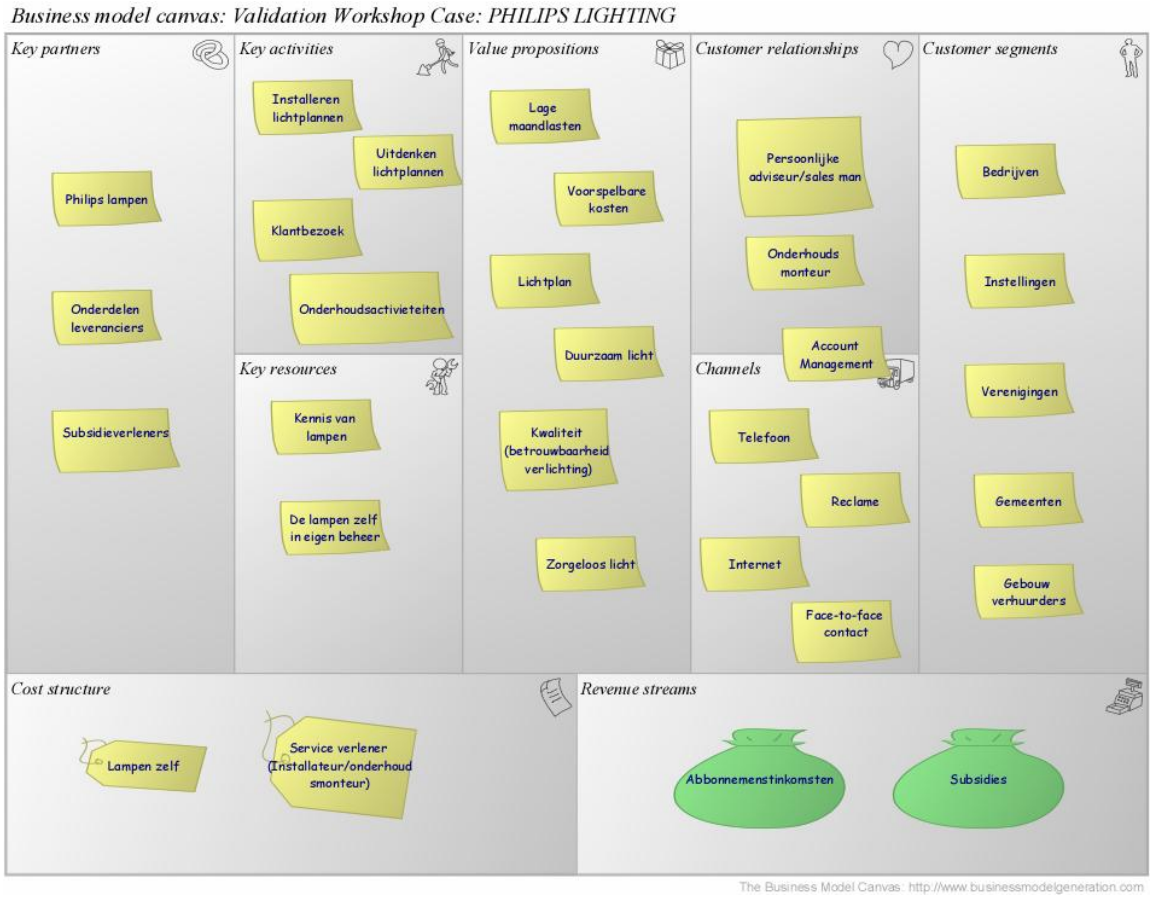
Kortom: door betaling van een maandelijks tarief blijft het budget van de klant beschikbaar voor andere doeleinden en kan de klant toch onmiddellijk profiteren van een hogere kwaliteit verlichting en energiebesparingen. En bovendien blijven huidige banklijnen van de klantvoor werkkapitaal beschikbaar door de reguliere dagelijkse bestedingen (philips.com)

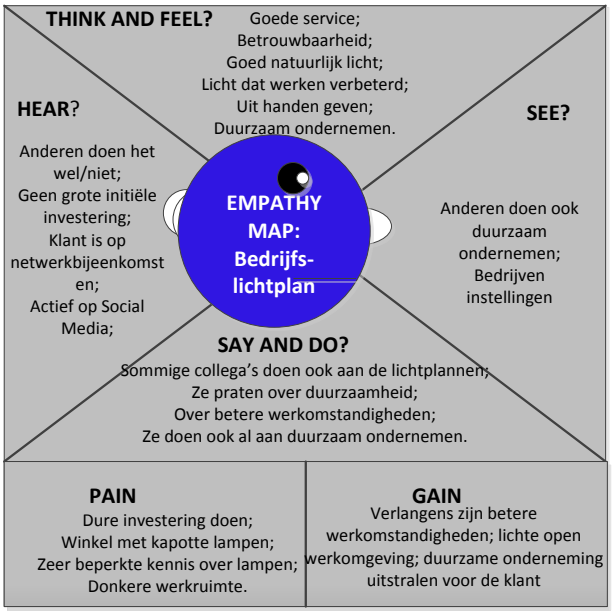
"Met Philips Lighting Capital investeren en direct geld verdienen"
Financiering van uw nieuwe Philips Lighting lichtoplossing is simpelweg een eenvoudige manier om de nieuwste lichttechnologie met de grootst mogelijke financiële flexibiliteit te kunnen gebruiken. Samen met Philips Lighting Capital kan de klant een complete, betaalbare oplossing samenstellen die helemaal op de fiscale en commerciële situatie van uw bedrijf is afgestemd.

Voor wie is dit interessant?

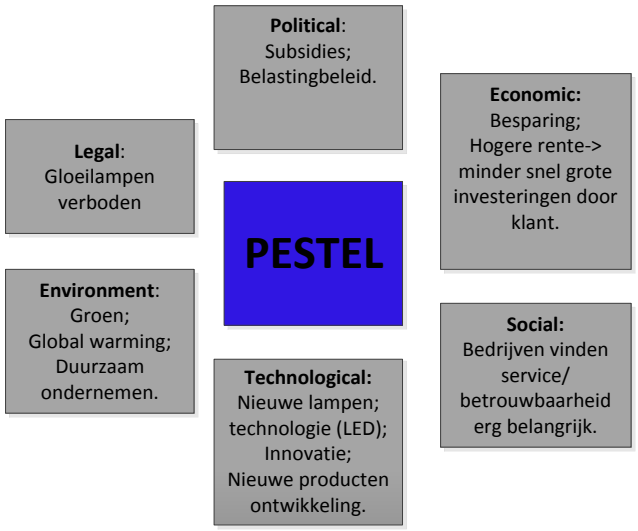
- ✓ Commerciële en industriële ondernemingen
- ✓ Hogescholen en universiteiten
- ✓ Non-profit organisaties
- ✓ Landelijke, provinciale en gemeentelijke overheden
- ✓ Scholen

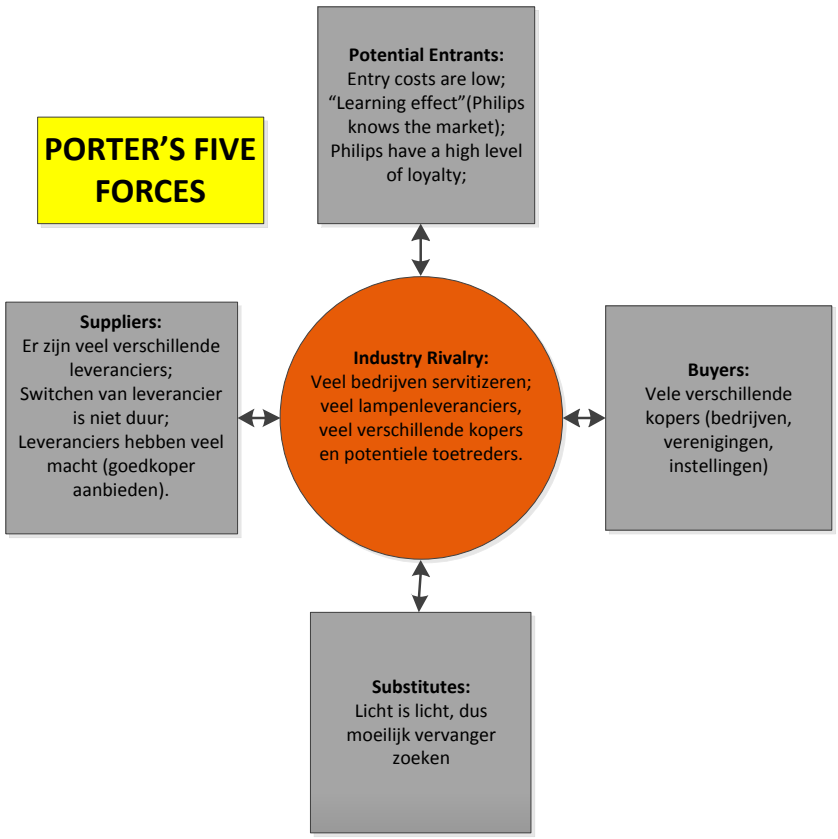
7.6. ELABORATION ANALYSIS TECHNIQUES DURING VALIDATION WORKSHOP (DUTCH)





"KILL"	"THRILL"
Abonnement is lange termijn commitment; Zwakke logistiek; Toch duurder; Het gevoel geen eigenaar te zijn; Geen vraagbehoefte; Klanten willen eenmalige kosten maken; Licht is niet onderhoudsintensief genoeg.	Groen (environment; Kostendekking door abonnement; Gemak; Kostenbesparing/efficiency; Lage maandelijkse kosten; Geen grote initiële investering; Kwaliteit/betrouwbaarheid verlichting; Beter gevoel voor behoeften klant door nauwer klantcontact.


Political:
Subsidies;
Belastingbeleid.
Economic:
Besparing;
Hogere rente-> minder snel grote investeringen door klant.
Legal:
Gloeilampen verboden
PESTEL
Environment:
Groen;
Global warming;
Duurzaam ondernemen.
Social:
Bedrijven vinden service/ betrouwbaarheid erg belangrijk.
Technological:
Nieuwe lampen; technologie (LED); Innovatie; Nieuwe producten ontwikkeling.


PORTER'S FIVE FORCES
Potential Entrants:
Entry costs are low;
"Learning effect"(Philips knows the market);
Philips have a high level of loyalty;
Suppliers:
Er zijn veel verschillende leveranciers;
Switchen van leverancier is niet duur;
Leveranciers hebben veel macht (goedkoper aanbieden).
Industry Rivalry:
Veel bedrijven servitizeren; veel lampenleveranciers, veel verschillende kopers en potentiele toetreders.
Buyers:
Vele verschillende kopers (bedrijven, verenigingen, instellingen)
Substitutes:
Licht is licht, dus moeilijk vervanger zoeken

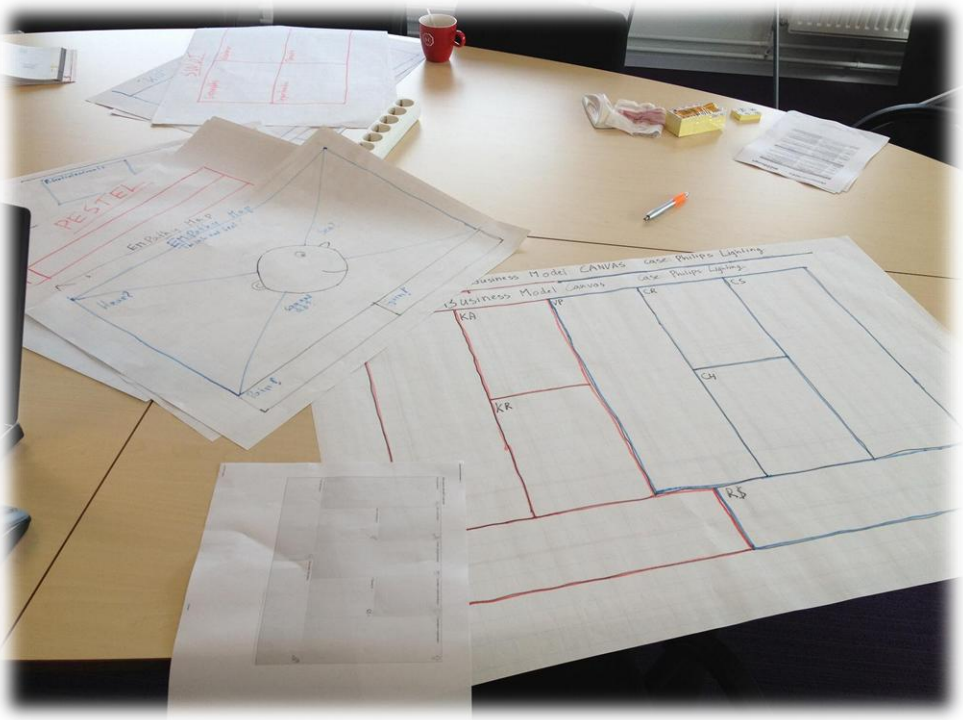
7.7. IMPRESSION VALIDATION WORKSHOP

In this paragraph an impression of the validation workshop is displayed.

The structure of the workshop was as follows:

- Short introduction “Servitization”
- Case Philips Lighting
- Explaining model-based approach
- To work with the model-based approach
    - detail step 1: 20 min, subsequently feedback (10 min)
    - detail step 2: 20 min, subsequently feedback (10 min)
    - coffee break: 15 min
    - detail step 3 & 4: 10 min, subsequently feedback (15 min)
    - detail step 5 & 6: 5 min, subsequently feedback (15 min)
    - Overall feedback on model-based approach (pros and cons) (15 min)


En nu aan de slag! Stap 1 en 2


PESTEL
Business Model CANVAS case Philips Lighting
KA
KR
KS
CR
CS
CH


En nu aan de slag! Stap 1 en 2...
Conceptualizing
Systematizing
Servitizing
MAIN PROCESS STEPS
DETAIL PROCESS STEPS
Begin met stap 1, controleer ook de bijbehorende tabellen
Feedback stap 1
Ga verder met stap 2, controleer ook de bijbehorende tabellen
Feedback stap 2
Koffiepauze
BiZZdesign

7.8. BRAINSTORM SESSION: FREE-WHEELING TECHNIQUE

This information is out of a book of "basics tools for process improvement, module 2 Brainstorming (Doh.com):

What is Brainstorming?

Brainstorming is a tool used by teams to bring out the ideas of each individual and present them in an orderly fashion to the rest of the team. The key ingredient is to provide an environment *free of criticism* for creative and unrestricted exploration of options or solutions .

Why should a team do Brainstorming?

Brainstorming helps a team break free of old, ineffective ideas. This free-wheeling technique for generating ideas may produce some that seem half-baked, but it can lead to new and original solutions to problems. Some of the specific benefits ofBrainstorming are that it:

- **Encourages creativity.** It expands your thinking to include all aspects of a problem or a solution. You can identify a wide range of options.
- **Rapidly produces a large number of ideas.** By encouraging people to offer whatever ideas come to mind, it helps groups develop many ideas quickly.
- **Equalizes involvement by all team members.** It provides a nonjudgmental environment that encourages *everyone* to offer ideas. All ideas are recorded.
- **Fosters a sense of ownership**. Having all members actively participate in the Brainstorming process fosters a sense of ownership in the topic discussed and in the resulting activities. When the people on a team contribute personally to the direction of a decision, they are more likely to support it.
- **Provides input to other tools.** You may want to affinitize the brainstormed ideas. And, if appropriate, you can work with the team to reduce the number of ideas by Multivoting.

Brainstorming is useful when you want to generate a large number of ideas about issues to tackle, possible causes of problems, approaches to use, or actions to take.

What are the ground rules for Brainstorming?

For all participants to enjoy a creative and productive Brainstorming experience, the facilitator needs to review and get team members' buy-in on the ground rules for thesession. These are the rules:

- **Active participation by all** team members. Everyone expresses his or her ideas, even if they seem silly or far out.
- **No discussion**—criticisms, compliments, or other comments—during the brainstorm.
- **Build on ideas** generated by other team members.
- **All ideas written exactly as presented and displayed** where everyone can see them.
- **Set a time limit**.

- **Clarify ideas.** After the brainstorm, go over the list to make sure that all team members understand the ideas. Remember that you are only clarifying the ideas, not making judgments about them.
- **Combine ideas.** See whether two or more ideas that appear to be the same can be combined.

How is a Brainstorming session conducted?

The recommended sequence for conducting Brainstorming some suggestions for conducting the session effectively are provided below:

- **Review the rules** for Brainstorming. Describe how this session will be conducted by going over the points below.
- **Set a time limit** for Brainstorming, assign a timekeeper and data recorder and start the clock. Brainstorming should be a rapid generation of ideas, so do it quickly; 5-15 minutes works well. If the time limit has expired and ideas are still being generated, you can extend the time limit at five-minute intervals.
- **State the topic** to be brainstormed in the form of a question. Write it down and post it where everyone can refer to it. Ensure that everyone understands it.
- **Collect everyone's ideas.** After allowing a few minutes for the participants to think about the question, ask them to give their ideas. Establish either a *structured* or *unstructured* format for calling out ideas:
  > *Structured*: The facilitator establishes a rotation that enables each person in the group to contribute an idea in turn. Any individual who is not ready with an idea when his or her turn comes can pass until the next round, when he or she may offer an idea or pass again.
  > *Unstructured*: Team members call out ideas as they come to mind. This method calls for close monitoring by the facilitator to enforce the ground rules and ensure that all team members have a chance to participate.

- Record ideas on a chartpack as they are called out, or collect ideas written by team members on post-its™. Display the ideas where everyone can see them. Having the words visible to everyone at the same time avoid misinterpretation and duplication and helps stimulate creative thinking by other team members.

> When recording ideas, ensure that they are written down exactly as spoken by the team member. Don't interpret.

> Try to generate as long a list as possible. Keep Brainstorming until all participants have passed or the allotted time has expired.

- **Clarify each idea** after all ideas have been presented, to ensure that all members have the same understanding of it. Pointing to each idea on the chartpack in turn, ask the participants whether they have any questions about its meaning. You may have to ask the contributor to explain the idea in a different way.

- **Eliminate duplications**. If two or more ideas appear to mean the same thing, you should try to combine them or eliminate the duplicates. Before you can wrap the like ideas into a single item or eliminate any items on the list, all of those who contributed the similar ideas must agree that they mean the same thing. Otherwise, they remain as separate items.

7.9. INTERVIEW WITH FRANK BAKEMA (WAGENINGEN UNIVERSITY) (DUTCH)

Wageningen UR is een samenwerkingsverband tussen een 3-tal organisaties: Wageningen Universiteit, een groep instituten die toegepast onderzoek doet (DLO) en een hoge school van Larenstein. We zijn vooral bezig geweest met het kijken naar business modellen voor deze 9 instituten DLO. Deze wordt gefinancierd door ministerie van economische zaken, landbouw en innovatie, voor 50 procent. In jaren '80 was dit nog 100 procent. Ministerie deed vraagarticulatie, bijv. normen in mest wetgeving, hoeveel haringen er op gevist mogen worden, maar ook innovatie in levensmiddelen industrie. Verhagen heeft het topsectoren beleid ingezet, en wordt verwacht van bedrijven met de vraagarticulatie te komen. Hier stelt de overheid geld voor beschikbaar en dat moet dan 'gematcht' worden met het privaat geld (50-50). Voor de instituten betekent dit weer een enorme omslag. Dus de bedrijven moeten nu de vraagarticulatie te bedenken. Dit was de concrete aanleiding om aan de slag te gaan met business modellen en wel met het gebruik van de Business Model Canvas.

- *Hebben jullie met PSS te maken gehad? Zo ja, welke?*

Eind vorig jaar en afgelopen voorjaar hebben we met een groep een sessie gedaan onder leiding van Remco Blom van BiZZdesign. Onderzoek is in feite een service, je legt niet iets tastbaars neer, maar meer een rapport of onderzoek. Je onderzoek levert een stuk kennis op, waar anderen weer mee aan de slag gaan. Dit is te vergelijken met een service/dienst. Tegelijkertijd komen in deze sessie dingen naar voren, die nog veel verder de service kant uitgaan. We hebben ook projecten over duurzaamheid. We zouden bedrijven kunnen certificeren, in hoeverre ze echt duurzaam werken. Nederlandse ambassades hebben de opdracht om bedrijvigheid aan te dragen, wat moet toedragen tot een hogere levensstandaard. De service die wij leveren is het ondersteunen van deze mensen, vaak in ontwikkelingslanden. Er komt vaak naar voren dat de service veel belangrijker is geworden. Er zijn grote databestanden, waarbij data voor abonnees beschikbaar komen. Bestanden zouden hier veel gerichter moeten zijn, en daar zullen abonnees bij gezocht kunnen worden.

- *Werden bij deze sessies nog analysetechnieken gebruikt?*

Er worden geen analysetechnieken gebruikt, om deze sessies te ondersteunen. Ik ken een paar van je analyse technieken, maar niet allemaal. Er wordt uitgegaan van de ideeën en beelden van de mensen die aan tafel zitten. Dit zijn veelal onderzoekers en hebben vooral een drive waar ze zelf nieuwsgierig in zijn en daar proberen ze dan een klant bij te vinden. En voor een deel komen ze allerlei dingen tegen om iets meer in te doen, bijvoorbeeld een vraag vanuit de klantenkring, wat kan leiden to meer ideeën, wat er nog meer zou kunnen. Eigenlijk is elke onderzoeker een zelfstandig ondernemer en binnen die 9 instituten (DLO) loopt 2100 man rond.

- *Hoe zag zo'n sessie er uit?*

Er waren mensen aanwezig die vooral bezig zijn met business development, dus mensen met een specifieke rol en voldoende verankerd met de buitenwereld en wat er intern leeft. Je vaart toch op de ideeën die zij hebben. We kwamen met 40 ideeën op tafel. De ideeën hebben we geïnventariseerd en hebben we "geliked" en met de goede ideeën zijn we verder gegaan, en op een aantal ideeën is een Business Model Canvas uitgewerkt.

Je kunt de klant in het voortraject meenemen, maar dan moet je wel weten van wie die klant is. Er zijn 4-5 business model canvas ingevuld. We zullen een paar van deze canvassen gaan reflecteren en er een paar van uit pakken en deze omzetten in een pilot. Is het wel echt wat? Ook moeten er randvoorwaarden worden gecreëerd om een veilige omgeving te hebben. Stel dat alles is uitgewerkt en vervolgens stemt de raad van bestuur niet met het nieuwe business model in. In feite is het een risico analyse en dit moet ook op bestuurlijk niveau worden meegenomen. Dus het zoeken van bestuurlijk draagvlak is een belangrijk issue.

- *Wat vind je van de analyse technieken die gebruikt zijn? Zullen ze nuttig zijn*?

De praktijk leert dat brainstorming technieken erg nuttig zijn, en SWOT blijft vaak te vaag. Ik wil de mensen eigenlijk uit de comfortzone te trekken. De technieken dwingen je wel erg om langs deze lijn te denken, deze technieken kunnen beperkend zijn. Mensen in onze groep waren bijvoorbeeld soms gewoon klaar met de 'geeltjes'. Het is belangrijk om het te laten aansluiten op de setting. Een voorbeeld geven van een succes verhaal, met een business model, willen de mensen wel eens uit de setting halen, wat goed is. De technieken geven je wel nieuwe inzichten en zorgen dat mensen verder denken. Ze kunnen wel degelijk een goede ondersteuning geven. Een onderzoeker maakt als het ware de markt en is te vergelijk met de "blue ocean strategie". Je moet goed luisteren naar de klant, om de markt in kaart te brengen. Wanneer je een product hebt waar je weinig marge op maakt en je wil er een service bij bedenken, dan is de setting anders en kun je de klantenkring in kaart brengen.

- *Evaluatie van de rollen van de stappen:*

Bij de "idea generation" stap zijn de juiste mensen aanwezig. Waarom sales and marketing mensen bij resource allocation? Je kijkt toch welke resources nodig zijn? Deze zijn daarbij toch overbodig? Bij de rest van de stappen zijn volgens mijn inziens de juiste rollen aanwezig.

- *En wat is jouw overall mening over de modelgebaseerde aanpak?*

Het traject en de stappen die je daar in kunt onderscheiden heb je analytisch gezien goed in beeld gebracht. En het is waardevol doordat je de rollen, taken, input, output, technieken zo scherp neer hebt weten te zetten. Het helpt erg om een proces te structureren en geeft een nuttige ondersteuning. Analyse technieken, business models en architectuur zijn mooi met elkaar verbonden en geven een toegevoegde waarde van je afstudeerproject. Zoals je hoort

kan ik er geen gaten in schieten. Vanuit de praktijk kunnen er wel restricties aan zitten, zoals bijvoorbeeld tijd en cultuur.