KEMI-TORNION UAS

Productization process of services in telecommunication industry

Case Octopus Network

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ABSTRACT

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Technological environment is immersed in a rapid and continuous change where companies have to develop radical new services to be able to satisfy the users' needs. To reach this requirement, it is mandatory to make the services understandable and easy to buy for the customers, not forgetting the customization of the services. Productization helps companies in matching their offering with customers´ needs. The objective of this thesis is to find out if productization can be used with case company´s service development process and what are the success factors and obstacles are for doing that. In addition, as an output the workbook of productization for the case company is made.

A qualitative research method and single case study method is used in this thesis. Data collection is carried out by using semi-structured interviews, participatory and non-participatory observation as well as reading professional literature and other related materials. Due to the confidential nature of the interview information, the transcripts are not published in the Kemi-Tornio University of Applied Sciences Library Version. However, the supervisors have an access to a selection of interview transcripts.

To conclude, it can be suggested that there are several advantages of implementing productization process as a part of case company´s everyday operations. Productization is a suitable method for defining, concretizing and systematizing case company's services, and makes its service production more profitable and efficient. Well productized services can be duplicated easily when the overall process always stays the same. For case the company, one of the biggest challenges with productization is the investments needed for its productization work and the fact that productization requires dedication of time into it. Productization can fail simply because of scarce resources and lack of know-how. At the same time one of the important success factors for the case company with its productization is the size of the company as it helps the communication.

Keywords: productization, service development, success factor.

FIGURES

TABLES

CONTENTS

1 INTRODUCTION

In this chapter, the background and the research objectives including research questions of this study will be presented. Their discussion will be followed by the discussion of the conception of the terms used and finally the outline of the study is described.

1.1 Motivation and background

To explain the research topic and motivation, Octopus Network and its services have to be defined. The present author´s knowledge is based on his personal working experience in Octopus Network (henceforth referred as Octopus). Working in Octopus since the beginning of the Octopus project, I have seen the path from a mere project to a more company-like form of operations. Octopus Network, established in 2002, is an advanced and genuine wireless environment in which mobile technology as well as applications and services are developed and tested. Octopus provides test environment services for the telecom-related industry. The core of the Octopus service is a closed mobile operator environment designed for developing and testing mobile applications. The technical environment takes use of the nationwide multi-access mobile networks. Octopus is also involved in EU funded projects dealing with next generation technology research.

In practice, Octopus offers testing environment that can be used by mobile subscriptions provisioned into the environment or through any Internet Protocol (henceforth IP) based connection. Octopus offers the possibility to use a technologically commercial-like but closed mobile network with all the needed documentation and technical support. Octopus´s technical environment consists of carrier grade technology enablers that are used for mobile communications and that enable different mobile services. The aim of Octopus is to boost the adoption of new technologies, innovation of new applications and development of user centric mobile services.

When Octopus was established in the fall of 2002, it was started with the help of public funding and core partners' investments, and was operated as a project. Most of the largest investments into the technical infrastructure were made during the first four years. At the time, mobile technology was evolving rapidly and new technology

enablers were launched continuously. There was constant development of the so-called third generation mobile applications. Many of the technologies that were hyped at that time are now forgotten or replaced with some other implementations. Other technologies are so mature that there is not as much demand for testing as there used to be. For instance Short Message Service (henceforth SMS) applications are basic appliances nowadays and do not require special testing environments.

Today the technological environment is in a continuous whirl. The impact of emerging technologies is huge in every industry. The impact of the Internet has changed the business world. Reduction in communications costs has an impact on how people work and how the businesses are handled. In the telecommunications industry, the impact of the Internet and fast mobile networks have changed the mobile environment into a direction where new mobile applications are much based on Internet connection and bandwidth. There is no more need for operator-based technology enablers, at least not to the same extend as some years ago.

Despite the evolving industry, there still are services that use matured technology which Octopus is operating and offering to its customers. However, it is no longer economical to sell testing services that are based on matured technology, at least not by direct sales method. For Octopus to still get some return on the technology investments made during recent years, a new distribution and sales channel has to be developed. This thesis has its base in the already ongoing development of the new web based service product (hereinafter referred to as a service). In this Thesis I deal with the productization of this new service, inspecting the service process and how it should look like in the case company. The terms service, service process and productization will be defined in details in the chapter 3.1.

Developing this new service is to get the ‘old’ technology in Octopus´ testing environment into a more marketable mode that would facilitate its sales to larger and global audience. To succeed in this development work, Octopus would gain more profit from the old investments, with relatively low sales effort and less man power in support. The success of this new service supports Octopus´ forthcoming international business efforts both economically and also by gaining credibility within the telecom industry, thus enhancing its competitiveness.

1.2 Research objectives and research questions

A new technical solution, mentioned above, is already under development for distribution of the existing technology and services via the Internet. Frequently in technology development, there are engineers developing fancy technological solutions with no business or market aspect in mind. At the moment this is the case also in Octopus. The objective of this thesis is to clarify the process of productization in service development and find out if it can be used in the case company to help commercialization of the services. Besides the theoretical research about service productization, the empirical part includes the guidelines for productization of the service under development, in order to make it ready for commercialization. The thesis context includes a discussion of the theory of productization and service management, as well as development of the practical workbook for productization work of new services.

The objective of this research is to create a model and a set of guidelines for the productization process of the new marketable service, described in section 1.1, for the case company and also to provide a valuable insight into the complexity of the productization process of new services.

The main research questions are as follows:

1. What is meant by productization and how can productization be used for developing new services?

This question will be answered in the literature review part of this thesis in chapters 3 and 4.

2. What are the characteristics of the productization process suitable for the case company?

This research question will be answered in chapter 5, based on the findings made based on the literature review and comparing the theory to the interpretations made on the basis of case study interviews.

3. Are there any critical gaps, obstacles and success factors to be taken into account in the service development and productization process in the case company?

This research question is answered in chapter 5 based on the interviews and authors own interpretations and 8 years of experience working in the case company.

4. How the case company can utilize the identified success factors (if any) and tackle possible obstacles to get a successful productization process?

This question will be answered in the conclusions in chapter 6, with proposals for further development.

For the thesis to be successful, the expected output will be the workbook for productization for Octopus Network. The case company Octopus will also gain invaluable information concerning the productization process for the future service development efforts. Besides, the theory of productization process discussed in the thesis aims to provide a practical guideline about productization process for any kind of service companies struggling with productization.

1.3 Research methodology

The thesis is based on qualitative research. A single case study is chosen as the main research method. The case company is Octopus Network that operates in telecom testing service business. The research consists of the theoretical part and the case company specific part. Data collection for the theoretical part is carried out through reviewing literature on productization, innovation management and service management and marketing. Data collection for the case company specific part is conducted through participating and non-participating observation, through analyzing verbal and written reports. Also non-structured interviews with business managers and experts involved in the productization process in the case company are conducted. The thesis is development oriented as the research is carried out in parallel with the author´s present everyday work in the case company, dealing with the real-life productization project of the new service. (Ghauri 2004, 109; Yin 2003, 13-15.) The research methodology is described in more details in Chapter 2.

1.4 Outline and conception of the study

In chapter 2 research methods are described in details as well as the framework and conduct of the case study are described. The concepts and definitions of productization as well as its benefits and challenges are discussed first in the theoretical part in chapter 3. The service development process from the productization point of view is discussed in chapter 4. Empirical findings and results from the interviews are presented in chapters 5 and 6, together with the conclusions and suggestions for further research and development.

The focal concepts of this thesis´ theoretical framework are the concepts of *service* and *productization*. The more detailed descriptions of the theories behind these definitions are discussed in chapters 3 and 4.

Service can be understood as "an activity or series of activities of more or less intangible nature than normally, but not necessarily, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, that are provided as solutions to the problems of customers". The notion of service process is used "to denote the process in which the service is emerging for, and perceived by, customers, often in interactions by customers". (Grönroos, 2007. 14; 52.)

The concept of *productization* does not have a one commonly accepted definition for the productization of services and it does not officially exist in the English language. Usually the term refers to making the service offering more or less "product like", i.e. defining the core process and its outcome so that they become more "stable" and visible (Jaakkola & Orava & Varjonen 2007, 6-9). The goal of productization is to package the offering, technology or service, to make it possible for a customer to understand the content of it in advance. Productization consists of defining, describing, improving, producing and continuously developing the offering so that customer benefits are maximized and the service/product is easier to sell (Simula & Lehtimäki & Salo 2008, 5). In this thesis the concept of productization, described before by Simula et.al (2008), is used as the key definition and a basis of the productization process of the case company.

2 RESEARCH METHODOLOGY

This chapter describes the qualitative approach used in this study including research methods and techniques selected. In addition, justification for the chosen research methods and techniques is provided.

2.1 Qualitative research

The thesis is based on qualitative research. This type of research method is chosen mainly because a lot of relevant data exists in qualitative form only i.e. documents, specifications, and guidelines. New opportunities are indentified by analyzing relevant literature on productization and new product development as well as inspecting the company documentation related to its productization operations. This information is then synthesized with the knowledge of the real-life operations within in the case company to support the research arguments. In his book on qualitative methods in management research Gummesson (2000, 80) states that the best opportunity for researchers to develop their pre-understanding is to operate as active participants in a process rather than as interviewers or detached observers. Present author's participation in various duties during the eight years of working for Octopus has provided with an in-depth understanding of the business activities and operative practices within the organization.

Qualitative research method enables describing processes in identifiable contexts and also the chronological flow of events and activities can be perceived. In a qualitative study, the researcher is in contact with the real-life situation in the organization and it is possible to achieve an overview about of the context and its logics, both explicit and implicit. (Gummesson 1988, 76.) This is a single-case study which makes it almost impossible to use quantitative research methods due to a limited amount of relevant and comparable information sources. Case study as a method in general gives very limited possibilities for the generalizability of the research findings and this study is not an exception. At the same time, the goal of this work is to concentrate solely on the case company and its operations and not on other service companies within telecom industry or the research of the telecom industry as such. Taking into consideration the elements

discussed above, a natural choice as a research method for this research is qualitative research method.

This study can also be characterized as development-based research since the aim of the study is to both add new aspects into the theory and solve the case company´s problem. Besides of being the present author of this study, I also act as an employee in the case company working in cooperation with the case company´s other employees and other resources involved in the development of the new testing service. This allows me to be involved in the actual development work which subsequently adds to the research content by giving access to the company´s confidential information and tacit knowledge about the firm that otherwise could be unreachable. I will be wary of the dangers of reading subjective interpretations, i.e. reinterpretations or misinterpretations, into the descriptions and explanations in the analysis of the interviews and the information gained through active observation as well as related documentation.

2.2 Case study research

Case study is among the most used approaches for thesis research in business studies. Case study is a useful method when the area of the research is relatively less known, and the researcher is engaged in theory-building types of research. (Ghauri 2004, 109.)

Yin (2003) is frequently quoted for his view concerning the uses of the case study approach. He argues that case studies are a preferred approach when ‘how’ or ‘why’ questions are to be answered and when the researcher has little control over the events and when the focus is on a current phenomenon in a real-life context. (Yin 2003, 41; Ghauri 2004, 110.) Business-related case study research is often practical and it can also be normative. One can for example decide to study one project, or as in this case one business process. With the results of the study one can draw conclusions on how to develop the project or processes to be more successful and how to avoid some problems in context of this one particular organization or specific business context. (Eriksson & Kovalainen 2008, 116.) Case studies are useful when it is important to understand how the organizational and environmental contexts are having an impact on or influencing social process, and when these processes may only be fully understandable in the context of the particular organization. The main aim of case studies is not to produce

knowledge that could be generalized or other contexts in the conventional meaning but to explore and understand how the chosen case works as a configurative and ideographic unit. (Eriksson & Kovalainen 2008, 121; Hartley 2004, 325.)

As explained before with single-case study one does not provide enough comparable information to make any generalizations. Therefore, here the aim is to deeply understand the prevailing processes in productization in the context of the case company and to make suggestions targeted only for that particular company.

According to Yin (2003, 13-15), a case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context when the boundaries between the phenomenon and context are not clearly evident and in which multiple sources of evidence are used. Case studies can involve multiple data collection sources. These sources can include verbal reports, personal interviews, observation and written reports, such as financial reports, budget and operating statements including market and competition reports. (Ghauri 2004, 109-110; Hartley 2004, 323-325.) The discussion and analysis involve triangulation through utilizing the knowledge derived from my own participation in the company activities and practices, through interviews of and discussions with the management and developers, and through studying corporate literature and various written material. According to Ghauri (2004, 115) triangulation is one of the defining features in case study research and to ensure validation one should use more than one data collection method.

This research is a single-case study focusing on the one case company. The thesis focuses on studying a single case: Productization of service product in the telecommunications industry, case Octopus Network. The single case approach was selected because the case reflects the theories of productization into the practice for the case company´s productization operations. The single case research also enables an in-depth understanding of the service productization concept within the context of the case company. No generalization, in relation to other companies or the industry, can be carried out in this research. I am aware of the subjective nature of some of the descriptions and interpretations I am making based my own working experience in the case company and personal relations with the interviewees.

2.3 Data collection and analyzing methods

Yin (2003, 85) lists the six most commonly used sources of evidence in case study research as follows: documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. Data collection for the theoretical part of this work is conducted through literature review of the written theory of productization, innovation management and service management and marketing. Data collection for the case company specific part is carried out through direct observation and participant observation, and by analyzing verbal and written reports and other related company documents, such as specifications, descriptions, project plans, and marketing materials. Some of the materials are publicly available but most of them are company confidential. Also semi-structured interviews among business managers and experts involved in the service development process in the case company, as well as a couple of stakeholders, were conducted. These managers have full information and the entire picture of the different stages of service development process in the company. Managers with different competencies, for example product manager and sales manager, can provide information from different perspectives which helps to deeply understand the nature of the process.

As the purpose of the study was to increase the understanding of productization in Octopus Network, a qualitative approach was considered most suitable. The methods used in the data collection were semi-structured face-to-face interviewing and observation.

According to Yin (2003, 89), interviews are one of the most important sources of case study information and it has an important role also in this study. To be more specific, interviews are the primary source of information in this study. There are three different types of qualitative interviews, i.e. structured and standardized, guided and semi-structured and unstructured informal and narrative interviews. In structured interviews the same questions are used for all participants. In semi-structured interviews the topics or themes have been defined but there are differences in wordings and the order of the questions. In unstructured interviews just some guiding questions or concepts are offered to generate discussion which typically has a strong conversational style. (Yin 2003, 89.) In this study, the semi-structured interviews were used in a non-structured

manner. In this work non-structured interview means that the interviewee could continue the discussion also outside the initial question.

Perhaps the most difficult task in qualitative research is interpreting and analyzing qualitative data. (Ghauri 2004, 116.) Analyzing of the research material and data is conducted through synthesizing it to the theoretical base of information to be able draw conclusions concerning the case company. Synthesizing the gathered qualitative data into the written theory about productization requires in-depth scrutiny in order to be able to get the results in use for the case company. The challenge with semi-structured interviews is that while they are potentially a rich source of data, they suffer from limitations and biases. Personal interviews as social processes are strongly influenced by the relationship that develops between the researchers and researched. Interviews are communicative events where interviewer can easily slip into imposing his own norms and frameworks on the interviewee rather than aiming for objective understanding. The risk is that organization´s interests become the researcher´s interest. In this study the risk of subjectivity is evident since the present author, as a researcher, is working in the same company that is the object of the research. The fact that the researcher works in the company researched is also an advantage. As it was pointed out previously the present author has the access to information, documents and tacit knowledge that otherwise, for an outsider, could be unreachable. (Marchan-Piekkari & Welch 2004, 13-14; Macdonald & Hellgren 2004, 268.)

In the study for my statements I draw from the interviews with the managers and the developers working for Octopus, as well as the stakeholders around the service project. I have interviewed five people, directly or in-directly involved in the work of developing the TestingHotel service for Octopus. The aim of the interviews was to get the interviewees´ different views of the product development and productization process from a socio-techno-economic perspective. The interviews carried out in this study prolonged for on average one hour, where the discussion went on in an open, but semi-structured manner. Interviews were planned beforehand based on the research subject of this thesis; the outline for the interviews is as Appendix 1. Each interview was recorded and made into transcripts. Due to the confidential nature of the interview information, the transcripts are not included in the public version of this Thesis. The interviews were held mostly in Finnish and thus the quotations used in this thesis are translated by the author. I interviewed three management level people from Octopus and two outside

stakeholder representatives, one from Octopus´ board of directors and the other from subcontractor. Due to privacy of the interviewees their identities are not published, though people who know Octopus might recognize them. The interviewee quotations used in this thesis are anonymous and without titles or other identifiers. The interviewees were selected naturally inside the case company each representing their own field of profession; marketing management, sales management and technology management. All of which have a long history in telecommunications industry in very versatile jobs ranging from product and program management to sales and marketing of high technology products. The interviewees outside case company included the SW research and development professional with 15 years experience, and a director level person with product development and manufacturing experience from telecommunication industry. All the interviews were aiming to get the answers to the research questions from the interviewees' point of view, everyone representing slightly different areas of business. Results from the interviews were analyzed and are represented in the chapter 5.

As I was working full time for the case company during the research, also participating observation had a great role as one of the data collection method. In addition, I was also working in significant role in the external development project related to the new service in question, working with representatives from different companies and research institutes from different countries including Spain, Slovakia, and Belgium. Thus I was gaining also international point of view and experience from the discussions with several middle- and senior-level management employees to contribute for the research topic, this information has had an effected to the results presented in the case company specific chapters. Working whole time in the case company has given me a good understanding of the research topic within the case company. The descriptions and interpretations in terms of the research topic are contributed to by my knowledge of the business environment of the case company.

3 LITERATURE REVIEW

3.1 The concepts of service and productization

In this chapter, the definition of service and productization are discussed in detail. In order to be fully able to understand the concept of service productization one must understand the definitions behind these two terms and related phenomena.

3.1.1 Service

There are still difficulties to define services, much due to the intangible nature of services. The definitions are usually short and condensed and most often described from the service company's point of view. In his books Gröönroos (1991, 49; 2007, 54) lists a selection of definitions for service as is illustrated below:

"Services are separately definable intangible acts that, when marketed to consumer or company, fulfill needs which are not necessarily related to sales of a product or another service."

"Services are something that can be bought and sold, but are impossible to drop on your toes."

"A service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, takes place in interactions between the customer and service provider, which are provided as solutions to customer problems."

According to Gröönroos (2007, 54), the most important characteristic of services is their process nature. When the customer participates in the process, the process, especially the part in which the customer is participating becomes part of the solutions.

Despite the fact that there is no precise definition for service, three fundamental characteristics can be found (Gröönroos 2000, 47) as is illustrated below:

1. Services are processes consisting of activities or a series of activities rather than things.

2. Services are at least to some extend produced and consumed simultaneously.
3. The customer participates in the service production process at least to some extent.

Even though Gröönroos´ definitions are all applicable, in this thesis the service definition provided by Kotler & Armstrong (1999, 13) is used, in their book they argue that: “A service is any activity or benefit that one party can give to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product”. This definition is suitable for this thesis because it comprehensively defines also the essence of web-based/SaaS (Software-as-a-Service) services by giving a possibility to combine the intangible service dimension that can be provided for customer using tangible technological products as tools.

3.1.2 Productization

There is no widely accepted definition for productization in the literature. Actions related to productization are often referred to as conceptualization or systemization of services. Productization is sometimes mixed with the term commercialization, which relates more of the activities related to commercial launch of the product, where, according to Jaakkola et al. (2009, 2) productization of services is seen as standardization of service to match product-like standard features. The research over systemization of services has also been carried out under the term New Service Development (NSD). Compared to NSD, productization is more neutral in regards of the newness of the service to be systemized. NSD can be seen almost as a synonymous with service innovation, meaning that the target is totally a new service or radically redesigned existing service. The requirement of newness is not essential with the idea of productization, although a careful analysis of one´s service may lead to profound renewal which can even be called as innovation. (Valminen & Toivonen 2009, 1-5.)

Moisio (2006, 2) defines productization as follows: ”Productization is customer oriented service definition, development, description, concretizing as well as setting up readiness for production and market launch, in a way that the product meets the impressiveness, customer benefit and other profit target expectations set upon it.”

In this thesis Moisio's definition above is valid as the productization is seen as a definition of existing and/or new services, systemization and partial standardization of internal and external processes. The aim for productization is to amend and develop services through quality and productivity in order to maximize the customer benefit and company profitability (Jaakkola et.al 2009, 2).

Productization is about concretizing services in a way that they obtain the characteristics of a product. Productizing is also a process where service´s content, purpose and price is defined and packaged into systemized service offering. (Parantainen 2007; Valminen & Toivonen 2007, 2.) Below is an illustration (Table 1) of differences between non-productized and productized services. The illustration is modified from the service qualities listed by Parantainen (2007, 13) and Moisio (2005, 7).

Table 1. Non-productized vs. productized services (modified from Parantainen 2007, 13and Moisio 2005, 7)

Specific to non-productized services	**Specific to Productized services**
Pricing changes	”Fixed” pricing
Implementation varies	Implementation is defined
Hard to sell	Easy to buy
Recurrent routine work and non-essential work	Expertise
Knowledge person dependant	Group knowledge
Redoing tasks	Duplication of tasks

According to Jaakkola et al. (2009, 2), productization is one possible tool to systematize both the development and the production of services so that continuous innovation, cost efficiency and customer orientation become a part of everyday life.

Productization can be restricted to the more accurate defining of already existing services, but more commonly the term includes also some renewal of the service. Because of this, productization can be a factor that stimulates the service company to produce new innovations. (Valminen & Toivonen 2007, 3.)

In this thesis the service definition provided by Moisio (2006, 2) is used, in his book he defines productization as follows: ”Productization is customer oriented service definition, development, description, concretizing as well as setting up readiness for production and market launch, in a way that the product meets the impressiveness, customer benefit and other profit target expectations set upon it.” . This definition above is valid for this Thesis, and for the case company, as the productization is seen as a complete model for both existing and new service productization.

3.1.3 Productization stages

Sipilä (1995, 12-13) sees productization as a way of thinking and as a practical implementation of product strategy and new product development strategy. 1 below.

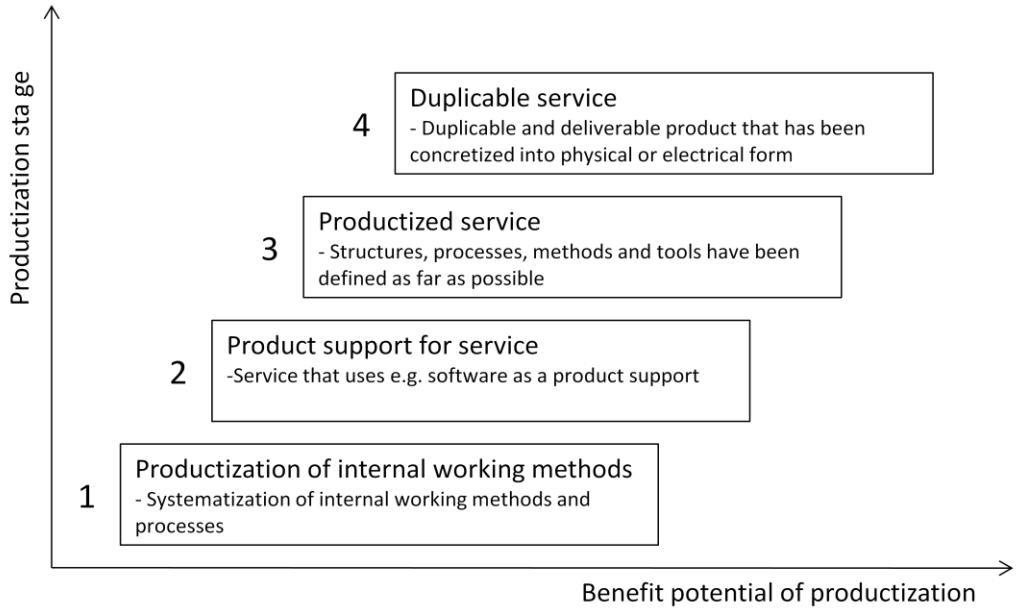

Figure 1. Productization stages (modified from Sipilä 1995, 13; Torkkeli et al. 2005, 24.)

The focus of productization varies. It can be just a minor change of style or appearance in the service, but it can also mean upgrading of the existing service. In addition, the idea may be to extend the company's service portfolio in current markets, or to develop a new service to an existing customer need or a totally new service to a new customer need. (Valminen & Toivola 2007, 4.)

3.1.4 Inbound & outbound productization

Basis for service productization is to rationalize the production and delivery processes. The customer sees the service that is packaged and delivered to him, but the production process behind the personal part is something that remains unseen, except for the service development part where customer may participate. These two sides of the productization can be divided into inbound activities and outbound activities described in Figure 2. (Simula et al. 2008, 5; Sipilä 1996, 47.)

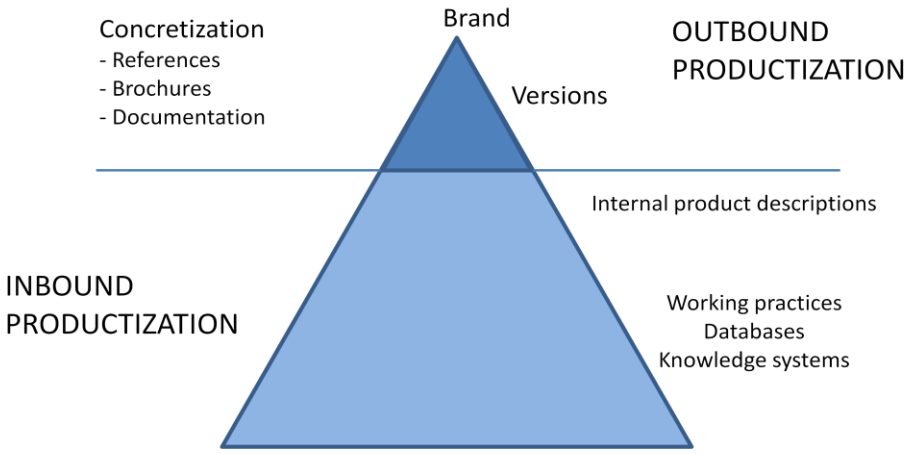

Figure 2. Inbound and outbound productization (modified from Sipilä 1996, 48)

Inbound productization reflects the development of company's internal processes and activities. Main purpose of inbound productization is to harmonize and systemize the offering delivery process in a way that routine work is minimized by using existing templates, platforms and modules. Simula et al. (2008, 6) note that promoting rationalization or formalization does not mean that all work should be standardized and creativity suffocated. On the contrary, there is usually more room for innovative

thinking when routine tasks have been reduced. In other words, productization brings in certain discipline but also forces people to think new solutions that serve both a customer and a manufacturer alike. For example avoidance of routine engineering work from scratch and usage of various data management methods and tools have been used to systemize the offering delivery process. As seen from the Figure 3, Simula et al. (2008, 6) describe the inbound productization as ability to make and the outbound productization as ability to sell.

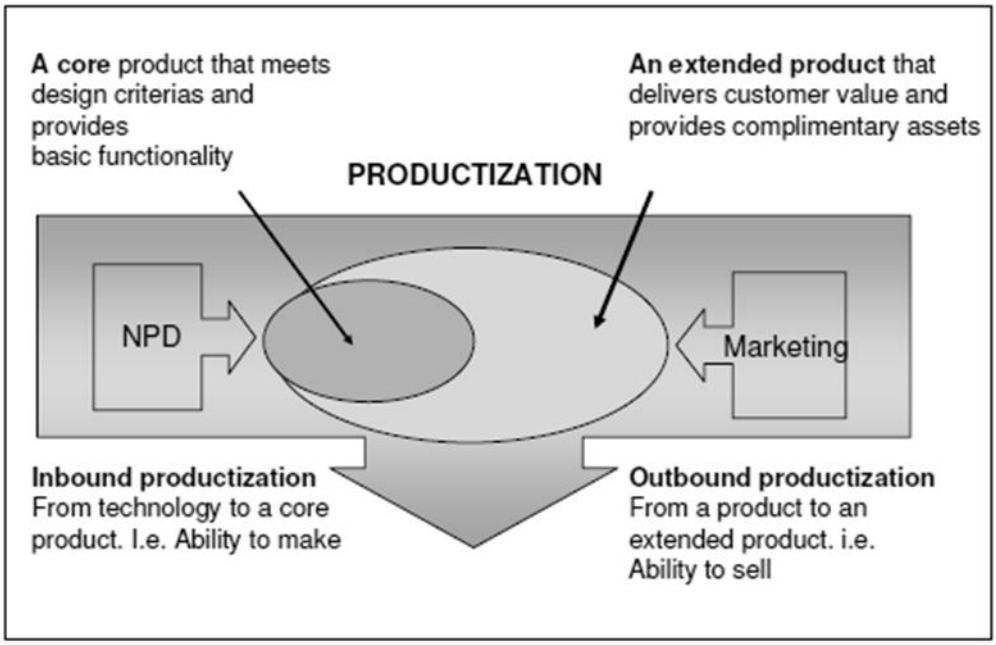

Figure 3. Conceptual illustration of productization (Simula et al. 2008, 6)

A core product forms the basis for what a firm sells. It can be very basic feature or software but in practice firm has to create a path from technology to a core product. A firm can use one particular technology and build various products based on that technology or combine various technologies into one product. In this case technology can be seen as an enabler for an innovation and appear in a form of a product. For example, prototypes are often the first attempt to communicate how technology can be refined into something that ‘does the job’. The problem is that a customer may like these prototypes but he is not willing to buy them yet. This means that there is still much development before a prototype reaches the technical maturity of a core product. For instance final design specifications, testing and quality control, certifications and accreditations etc. This development work is the main focus of inbound productization.

By systemizing and rationalizing company's internal operations, the time for working within customer interface multiplies. The objective of inbound productization is to create a service that a firm can repeatedly produce with reasonable costs. This does not mean that tailored services should be excluded. The aim of productization is to come up with an array of products, which naturally may vary in sizes and shapes as the purpose is to follow the principles of mass customization. (Simula et al. 2008, 6; Sipilä 1996, 48-49).

Outbound productization is described by Simula et al. (2008, 6) as ability to sell. Precondition for outbound productization is the systemization of inbound productization. Customers perceive outbound productization as a visible communication that concretizes the service offering and enhances its visibility and desirability. The purpose of outbound productization is to quickly create an image of a company and to show the value and benefits that it can offer for the customer. There are many things that can add value on top of the core product; such as brand, design, training, or after sales service. For instance a surgeon can show pleasant images of a patient recovering from an operation. The success of the overall productization effort is dependent on the company's understanding of the market's needs. It is important to try to understand the end customer requirements as early as possible in the development process of a new service. This ensures that a company is able to develop and concretize the offering in a way that satisfies the customer. A firm has to come up with a clear segmentation decisions of which customer groups to serve, what ideas are possible or worth to implement, and how to prioritize them. (Lehtinen & Niinimäki 2005, 43; Sipilä 1996, 48-49; Simula et al. 2008, 6-7.)

Sometimes, especially in ICT industry, companies are too much focused on the designing and engineering of the core product or service. This can lead into a situation called over engineering. No matter how sophisticated the core product or service is from the engineering point of view, it may still lack many of the assets that should be in place with the final offering. Often product creation functions do not pay too much attention to the other activities that are needed in order a company to have a complete, consistent and sellable product – an extended product. These tasks typically fall under marketing functions, and the best outcome will be achieved when these tasks will be performed in cross-functional teams. An extended product is the outcome of outbound productization efforts. These in practice mean various marketing related tasks such as: branding and

naming, warranties and technical support, user guides and documentation, advertisements, brochures and white papers, customer testimonials, contracts and/or license terms, sales channels and commissions, sales tools and pricelists, as well as logistics and packaging. When a service is properly augmented so that it can be easily sold and used by a customer it becomes product. (Simula et al. 2008, 7.)

After outbound productization is complete, the company has reached the point where a service product is ready to be sold to customers in a wide scale. The extended product is now complete. The core product itself includes only a promise that there are some potential to utilize it somewhere, but an extended product is needed to communicate the real performance, value, and worthiness of that product to a customer. The extended product makes it possible for customer to compare and benchmark it to competitive products, and to see and understand what is being offered. Customer can calculate if the price versus benefit ratio is sufficient enough to justify the purchase, he/she can evaluate delivery time, level of support, maintenance or replacement considerations, legal aspects and warranties, logistics, installation, training and other variables that are now in place with the extended product. To be successful in productization efforts, a company has to be able to create a balance between ability to make and ability to sell. (Simula et al. 2008, 7.)

In this thesis the inbound productization is seen as the activities related to the development of the new service. Related to Octopus´ development processes with TestingHotel, these activities include for example choosing the features to implement, the testing of features with end-users, adjustment according to feedback and the training of personnel how to use and sell the new service. In this thesis the outbound productization is mostly related to packaging, standardizing, marketing, and activities related to commercialization of the new service, meaning all the activities needed to make a service package that can is easily understandable to customers and easy to buy.

3.1.5 Benefits

The value of the company is depended of the competence of its employees, through productization the expertise of the employees can be transferred as a part of company´s assets in the balance sheet. Through productization, service companies usually aim at

improving competitiveness and performance. Defining, concretizing and systematizing service make its production more profitable and efficient. Well productized service can be duplicated when time of re-doing things is reduced. When the production process is properly defined, the quality of the service becomes more stable. In addition, the possibilities to accumulate knowledge systematically are improved. Productization often intensifies learning and the transfer of knowledge and enables the division of work. Time is used more efficiently to innovation and crating new instead of routines. Internal work distribution intensifies when responsibilities can be divided in a more balanced way. Finally, productization makes the pricing of the service easier. Companies may even switch from selling experts' time to selling value propositions with a fixed fee. From the sellers point of view a clearly defined and priced service is easier to sell than ambiguous expertise. (Moisio 2005, 16; Sipilä 1999, 15–22; Valminen&Toivola, 2007, 3-4.)

All these impacts lead not only to better competitiveness, but they also open possibilities for better management. The producer knows better what he is selling and the customer knows better what he is purchasing. This way also the customer benefits from productization. It becomes possible for them to compare the outcome of the service with the service promise and to compare the benefit received with the price of the service. In other words, productization facilitates the evaluation of the service. The quality of service improves and leads to decreased risks also for the buyer. The increased tangibility and concreteness makes the service more tempting and easier to buy. (Moisio 2005, 16; Sipilä 1999, 15–22; Valminen&Toivola, 2007, 3-4.)

3.1.6 Challenges of productization

The benefits of productization were discussed in the previous chapter. Although the benefits of productization are indisputable there are however also challenges to overcome.

The first challenge is to find out the customer needs. If the needs are not thoroughly searched the whole productization has been for nothing. One way to avoid this problem is doing a careful research and taking the customer as a part of the whole process. One should not forget the importance of piloting and testing of the service either, it too

should be carried out together with the customer, collecting feedback from the service throughout the whole process. (Jaakkola et.al, 2007, 2.)

A customer may not be able to see the difference between productized and non-productized services and thus is not willing to pay a higher price. A customer may also require a service to be built from scratch according to his requirements. They cannot see how their "unique" needs could be productized beforehand and thus demand a highly customized service just for them. This is a problem especially with the engineering services where service innovations are required. This can be overcome with modularization which is further discussed in section 4.1.3. The company may productize at least recurrent part of the service into modules, which leaves more time to do the customized part of the work. (Sipilä 1995, 118, 121; Torkkeli et al. 2005, 31-32.)

The second challenge or problem may emerge from the resistance for change. The fact that the expert who knows everything about the service where he is expert should be shared with everybody can be threatening, and can even make them feel their position to be threatened and leading them to try to protect their own expertise. They do not see the benefit of productization for themselves and see it only as extra work (Sipilä 1995, 115-116).

The third challenge or threat is linked to competition and piracy. Well productized service is more interesting for competitors and is exposed to imitation or even copying. Also company´s own employees can try to take the product with them when changing employers. This kind of threats can be prevented with well-defined contracts with both the customers and own employees. Intellectual property rights are not clear with services; companies may protect themselves with registering trademarks, patents, models etc. Also publishing the service concept is a good way to protect your own. By publishing the service company acclaims the service concept as its own. (Sipilä 1995, 119).

Additional challenge is the investments needed for productization of service. The productization requires time and money and can fail simply because of scarce resources and lack of know-how. Productization is often done as an extra work in addition to daily duties. Companies should invest enough in the productization and either allocate or acquire needed resources. The prime costs of productization can be decreased by linking

efforts as a part of daily routines. With productization the production costs can be decreased and thus improve profitability. (Sipilä, 1995, 121).

These challenges are all somehow relevant also with the case company´s situation. Octopus is also facing these when developing and productizing its services. How these challenges affect and how Octopus can tackle them are further delineated in chapter 5, based on the findings made from the interviews.

3.2 Development of service offering

In this chapter the service offering development is described with emphasis on the process stages that the author sees are the most important for case company and the productization process that is developed for it. The whole service development process from idea generation and all technical stages are not relevant to go through, but mainly to discuss the focal points of the service development process that are especially important to stress alongside with productization efforts of the case company. Emphasis is put on the service concept, and customer, and quality perspective.

3.2.1 New Service development

Innovation plays an important and dual role, as both a major source of uncertainty and change in the environment and a major competitive resource within the company. (Tidd et al. 2005, 110.) In their report, John Bessant and Andrew Davies (2007, 62) claim that especially to service sector players across the economy the role of innovation is significant and the pressure to innovate is stronger than in manufacturing. They explain that this is because new ideas in services are often easier to imitate quickly and harder to protect than physical products. They use the following definition for service innovation: “the successful exploitation of new ideas” where the successful exploitation is usually understood as profitable.

Service innovation and development can be based on different goals (Jaakkola et. al, 2009). The aim can be:

- refreshing the existing service image
- enhancement of the existing service
- expanding existing service range to new markets
- new service for existing need
- whole new service for whole new need

Especially in high technology industry innovative developments can be placed on a continuum ranging from radical, breakthrough developments to more incremental, modest developments. Jakki Mohr (2001, 15) describes radical innovations as: "So different that they cannot be compared to any existing practices or perceptions. They employ new technologies and create new markets". Radical or breakthrough innovations are usually developed in supply-side markets which are characterized by innovation driven practice where R&D has the upper hand over markets and commercial targets are considered only after the innovation is developed. This is referred to as technology-push situation and many times include so called over-engineering. (Mohr 2001, 16.)

As with many, if not the most, of the high technology companies the risk of technology-push situation is evident; engineers are fine tuning and building more and more technical features without thinking the real needs of customer. Deriving from the working experience in the case company, this has been somewhat a problem for Octopus also, if not making things too complicated in technical vise but more like concentrating solely to the technology push-part and not to the real customer needs.

Reciprocally Grönroos (2007, 184) reminds that when developing services and service offerings it is essential to remember that all models and concepts are based on the fact that the service emerges in a process where customer participates as a co-producer, and that the production of service is not separate from the consumption of this service. Also Edvardsson and Olsson (1996, 141) see the customer as a focal point when delivering services; customer is the person/organization receiving the outcome of the operation. It is common that customers actively participate in the production process of the service. Customer´s role can be seen as one issue that complicates the service delivery. The perceived quality and added value of service is dependent of the demands and needs of the customer, and how the service succeeds to meet these expectations. The actual service provisioning cannot be done without the customer. The direct and active

involvement of customers in the service development process is becoming increasingly common in the development of high technology products, this is the case especially with SaaS or cloud based software services. (Edvardsson&Olsson 1996, 141-142; Zeithaml et al. 2006, 255.)

Customer participation in the service development process is necessary for company to really understand the needs and wishes of the customer properly. The meaningful dialogue with competent and demanding customer results in high quality services that fulfill the customer needs. This customer oriented paradigm is also called User-Driven-Development (UDI) in today's research (see for example Rosted 2005 and Christiansson et al. 2008). Innovation speaker and author Peter Merrill explains in editorial of Kauppalehti (2010, 5) that instead of making customer satisfaction queries the companies should be making customer dissatisfaction queries. Merrill stresses that working with unsatisfied customers the company receives more invaluable information for the development of their services and for making their existing services better.

As stated before, service is a process not a tangible product. Right prerequisites are needed to develop the best functioning service process that meets the customer needs. In service research literature the term service concept is often used. As its simplest it can be seen as the definition of the customer befits. According to Edvardsson and Olsson (1996) service concept defines what and how is done to satisfy the customer. Grönroos (2007) specifies service concept by dividing it into three parts: core service, enabling service and enhancing service (more in chapter 3.2.3). Edvardsson and Olsson (1996, 159) use service concept development as a part of their new service development process, the other two parts of the process are the development of service system and the development of service process (Figure 4.).

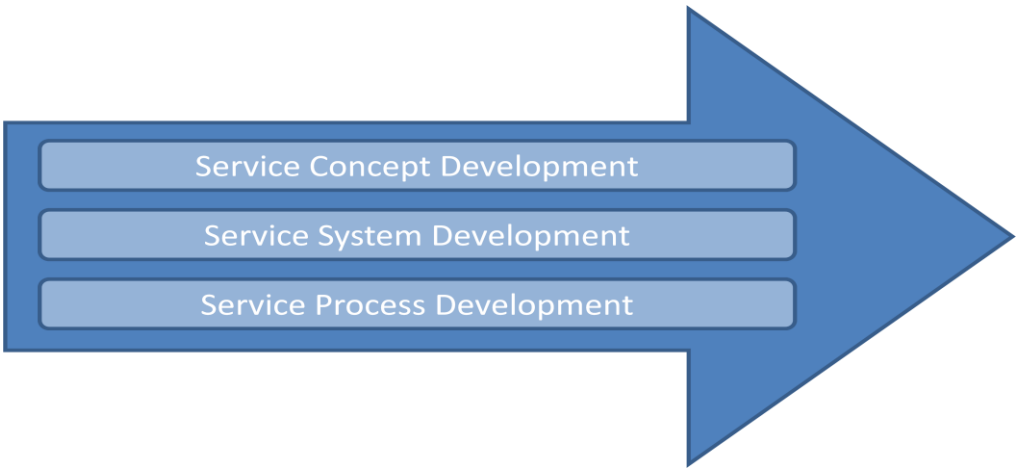

Figure 4. Model of service development process (Edvardsson&Olsson 1996, 159)

Service concept development refers to the description of the customer‘s needs and how they are to be satisfied in the form of the content of the service or the design of the service package. Service concept can be seen as a kind of a prototype of the service including the descriptions of core services and supporting services that correspond to the primary and secondary customer needs. In addition of the analysis of customer needs the commercial assessment is done in this part, including cost and income estimates, market analysis and internal analysis. The service concept defines the prerequisites for the service in order to meet the customer demands and for the quality to be realized as well as to be profitable. (Edvardsson&Olsson 1996, 148-150; 159-160.)

The service system constitutes the resources that are required by or are available to the service process in order to realize the service concept. In this model it means the resource structure including the service company‘s employees, the customers, the physical/technical environment and the organizational structure. These resources are conceived as sub-systems that need to function separately but also together with other sub-systems. Service system concept highlights the importance of all the elements that are involved in the service production and how they affect the outcome of the service of good quality. In the service system the demands placed by the service concept is fulfilled. The development of service system and service process must be developed interactively in order to attain smooth customer process. (Edvardsson&Olsson 1996, 148-154.)

The service process describes the chain of activities that must function when the service is properly produced. Service process can be seen as a prototype for every customer process, including clear description of the activities and resources needed to produce the service. The service process consists of an accurate description of various standardized and alternative activities in the customer process. It is important to involve all the concerned parties into the service process development, including partners/suppliers, internal departments and customers. During the service process various parts of the service system is used providing the necessary resources. This leads to the fact that the system is static but the process is dynamic, consisting of activities that are interlinked to form the service process. Deriving from the possibilities and limitations that are based on the service system the service process should be developed parallel to it. Detailed and comprehensive blueprints of the service process can be of great assistance to show how the service should be produced. The concept of blueprinting is described in the next chapter. (Edvardsson&Olsson 1996, 148, 155-157.)

3.2.2 Blueprinting

In their book about service marketing Zeithaml et al. (2006, 267) notes that one of the keys to matching service specifications to customer expectations is the ability to describe critical service process objectively and depict them so that employees, customers, and managers know what the service is, and can see their role in its delivery, and understand all steps and flows involved in the service process. Blueprinting is useful tool that helps companies with designing and specifying their new, or existing, service processes. Blueprinting provides a comprehensive visual model of the service process. It was originally developed by Shostack in 1982 and is commonly known for its ability to illustrate especially the irregularities within the service process that may or may not be visible to customers. A service blueprint is a map that illustrates the process of service delivery, the points of customer contact, the roles of customers and employees, and the visible elements of the service. Blueprinting provides means to break down the service into bits and portray the steps/tasks in the process including the means by which the tasks are executed, and the evidence of the service as the customers sees it. (Baron & Harris 2003, 96; Zeithaml et al. 2006, 267.)

A blueprint is a two dimensional picture of a service process. The horizontal axis represents a chronology of actions conducted by the customer and the provider. The vertical axis distinguishes between different areas of actions. Figure 5 shows the key components of service blueprints: customer actions, onstage contact employee actions ("front office"), backstage contact employee actions ("back office") and support processes. This figure shows the basic structure of the blueprint, these components may vary depending on the nature and the complexity of the service being described.

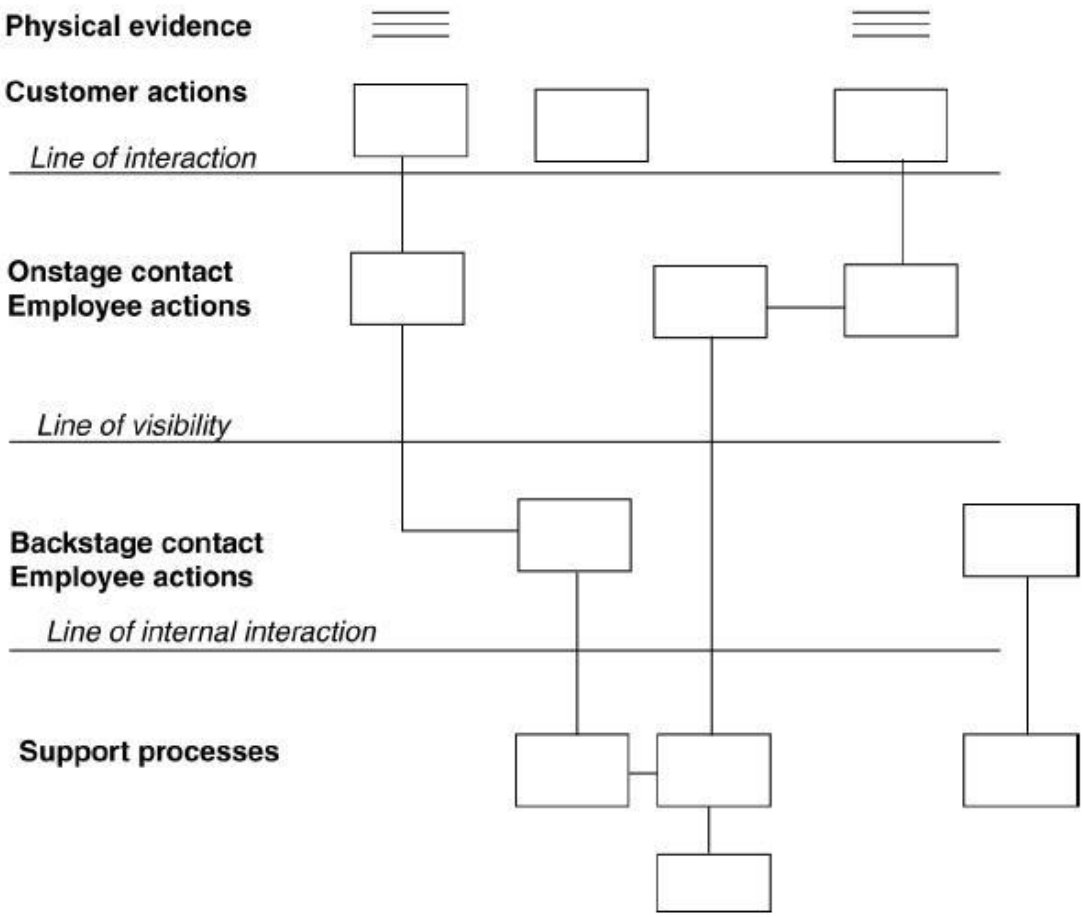

Figure 5. Service Blueprint components (Zeithaml et al. 2006, 268)

Blueprinting is a great tool as a part of the service productization process. When the resources needed for producing the service are known it is then much easier to plan and schedule the different activities needed more efficiently, and the cost structure for service production is more visible. Further reading and examples of the Blueprinting can be found from books by Zeithaml et al. (2006) and Baron & Harris (2003).

Within the service process, the company should pay attention to both the service process and service outcome. The process is particularly important for people involved in delivering the service. With business-to-business trade the management, which is the most important judge of the service, do not necessarily participate in the service process themselves, which makes the result and its applicability in practice truly important. (Zeithaml et al. 2006, 269.)

3.2.3 Service offering and concept

In chapter 3.2.1 the model for service development created by Edvardsson and Olsson was described, the three components – concept, process and system – are all seen as equally important from the viewpoint of systematization. There are, however, approaches that focus on only one of these components, like Norrmann´s definition (1991) that describes service concept only by the benefits received by customer. Grönroos (2007, 184) specifies service concept by dividing it into three parts: core service, enabling service and enhancing service. Grönroos concentrates not on the service development process itself but to core of the process i.e. how to understand and manage the object of development itself – the service offering. It is critical to clearly define the service concept before and during the development of service offering. The service offering demands a thorough understanding of the customer´s everyday activities and processes picture, in order to meet the customer benefits.

Managing the service offering consists of four parts (Grönroos 2007, 185):

1. Service concept
2. Basic service package
3. Augmented service offering
4. Image and communication

Intensions of the organization are determined by the service concept or concepts and the basic service package is developed based on these service concepts. The service package describes all the services that are needed to fulfill the needs of the customers in target market. As stated before Grönroos (2007, 185) widens the traditional view of the core services and peripheral services into three groups of services specifying enabling

and enhancing services in addition to core services. The core service is the reason for company being on the market e.g. for airline it is transportation. To be able to serve customers the airline needs also some additional services like check-in service. These are called enabling/facilitating services because they enable the core service. Third service type is enhancing services or supporting services. Airport lounges and in-flight services are examples of such services. Enhancing services do not facilitate the use of the core service but are used to increase the value of the service and to differentiate them from the competitors. The difference between enabling and enhancing service is not always easy, but it is essential to make the distinction. Enabling services are compulsory – without them the service package collapses. Whereas enhancing services are always used as a means of competition and differentiation. (Grönroos 2007, 184-186.)

Augmented service offering takes into consideration three elements of the service process – accessibility of the services, the interactions between the company and its customers as well as customers´ co-production aspects. When these elements are combined with the concept of basic service package the augmented service offering is created, see the figure 6 below.

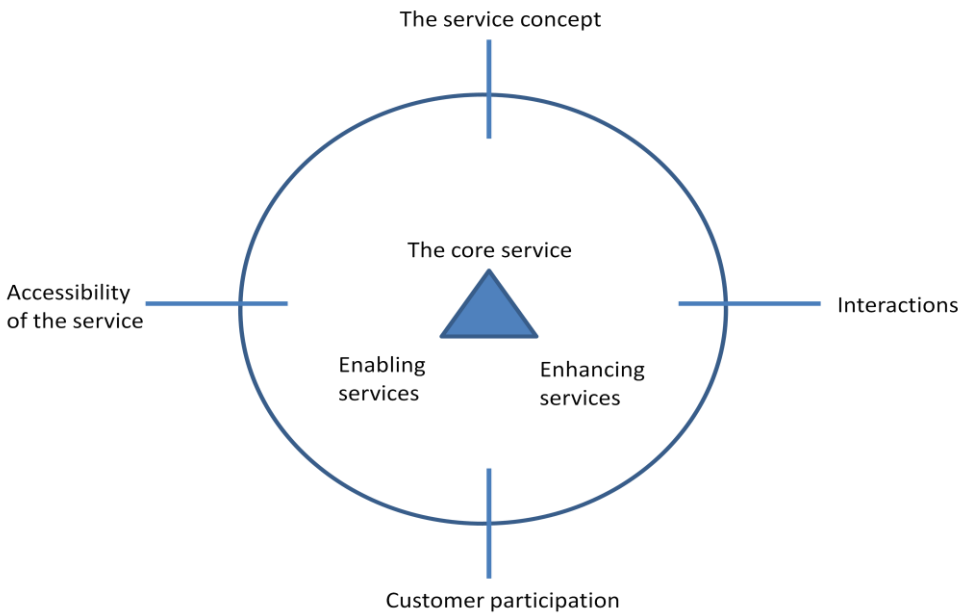

Figure 6. The augmented service offering. (Grönroos 2007, 187)

In this respect the accessibility of services can mean the accessibility of the site (parking possibilities, opening hours), customer ease of use of the physical resources like waiting room and its condition, service persons´ contribution to accessibility (response time or skills of employees) or ease of customer participation meaning the forms to be filled and their difficulty (this part is different when talking about Internet based services and will be explained in next section 3.2.4). Interaction can mean the communication between employees and customers, interaction with physical and technical resources, interaction with systems or interaction with other customers taking part in the service process. Customer participation means that the customer has an impact on the service he perceives, thus becomes a co-producer and therefore also co-creator of value for himself. In order to enhance the perception of the augmented service offering the company has to manage its corporate image and its marketing communication to be able to make desired quality perception of their services. Image has an impact as a filter on the service experience and through marketing communication this image can be formed as desired. (Grönroos 2007, 189-191.)

Developing a service offering is a highly integrated process. Every part and element should be taken into account when considering the other element e.g. enhancing service cannot be added without taking into account the augmented service aspects.

3.2.4 Technology intensive services

With the rise of information technology and the increase in Internet and mobile technology the scope for service innovation has grown enormously. In this relation services can be classified either into high-touch services or high-tech services. High-touch services are mostly dependent on people in the service process producing the service, whereas high-tech services are predominantly based on the use of automated systems, information technology and other types of physical resources. One has to remember that also technology based services such as telecommunications or web services are in need of high-touch characteristic services when critical moments occur and e.g. helpdesk personnel is needed. If the high-touch interaction in the high-tech service process fails there are usually fewer opportunities to recover the mistake than in high-touch service processes, many times customers will not give second chances that easily with technology errors than with human errors. New technology also gives

customers the means to access the services of a manufacturer or a service firm more quickly and easily. Internet makes services more accessible and that way it may improve interactions. (Grönroos 2007, 57, 192; Trott 2002, 238.)

Gröönroos (2007) notes that "the offering of any physical good or service over the internet is a service", and gives also a modified version from his service offering model described in previous chapter for Internet based services, and is also applicable in Octopus´ case. In this model the augmentation elements of Internet offering are different, as the accessibility and interaction elements cannot be kept apart. Instead they merge into one communication element. This service offering model for the Internet is called the NetOffer model and is illustrated in Figure 7.

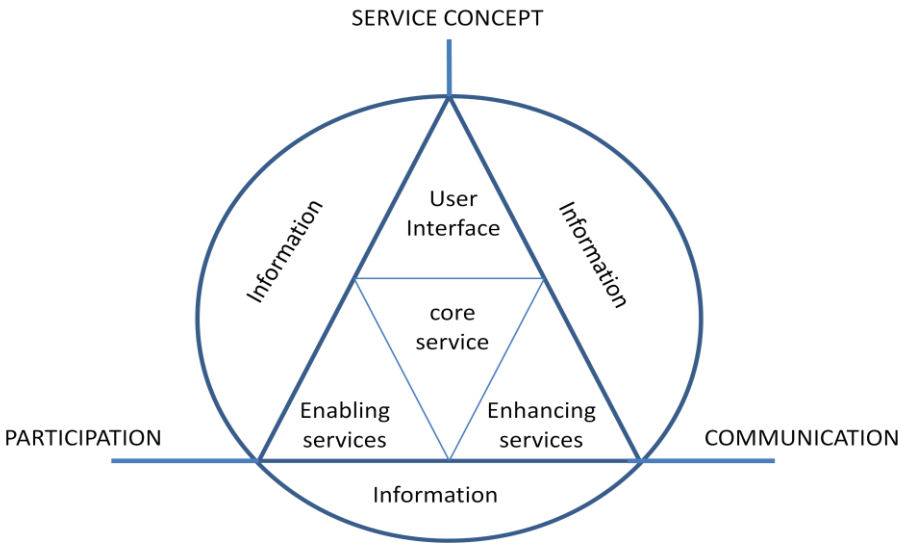

Figure 7. The NetOffer model (Grönroos 2007, 200)

When using the Internet there has to be an easy-to-use website i.e. well functioning interface between the user and the company in order to access the Internet offering. Compared to the traditional model this is called the user interface and included in the service package. If this interface does not work the whole service is unusable. With Internet services the role of information is of critical importance. Thus, in the figure 7 the service package triangle is put inside the circle of information, representing the information supply that has to be provided when offering services in the Internet. Information makes the core, enabling and enhancing services to run and drives the user interface. (Gröönroos 2007, 200-201.)

Compared to the original augmented service offering model (refer to 3.2.3) this service package includes only two elements instead of three i.e. *participation* and *communication*. The first element, the customer participation denotes the skills, knowledge and interest of customers as far as operating the user interface is concerned, so that they can make the purchase, make complaints and get responses etc. The second element, the communication represents accessibility and interaction in Internet. Getting access requires communication with the website using the user interface, and interacting with the website means communicating with the system through the user interface. Therefore interaction and accessibility merge into one element called communication. Communication element in NetOffer represents all the dialogue that can occur between service provider and the customer, including all the media that is available e.g. e-mail, telephone, forums. The service provider helps customers to purchase and consume services, or goods, through Internet by facilitating user-oriented communication. It is not enough though, that the Internet offering is functioning well and perceived service quality is good, the services or goods have to be also delivered to the customer in quality enhancing manner. This can happen electronically as is the situation with the case company´s TestingHotel service, where customer is also co-creating the perceived quality of delivered service. Also physically sending goods by mail to customer can be an option with Internet services. (Gröönroos 2007, 200-201.)

As summarization it can be noted that in order to develop attractive technology service, company must have a solid understanding of what customer needs, how his needs are satisfied and why would customer make the purchase decision. For example the case company’s services have been more or less unfocused to one particular need. The services that Octopus has been offering are too vague with value promise, leading to the situation where the customer does not understand the added value for them, thus service package should be developed very carefully and always concentrating on customer needs and on quality with delivering the service. The productization workbook developed as part of this thesis is helping to tackle this problem.

4 SUCCESSFUL PRODUCTIZATION PROCESS

Productization is very company specific and varies based on its services. Therefore it is really difficult to specify any general all inclusive productization process. In general, it is however possible to raise some factors that should be taken into consideration when productizing services. Some of these factors are described in figure 8. The productization of services can help the customers to easily perceive the company's product offering and at the same time productization brings added value for the core business activities supporting the company's overall brand. The service process that is productized can also be divided into parts that are sellable separately, thus lowering the threshold for customers to start cooperation with the company. (Sandbacka 2010, 14.)

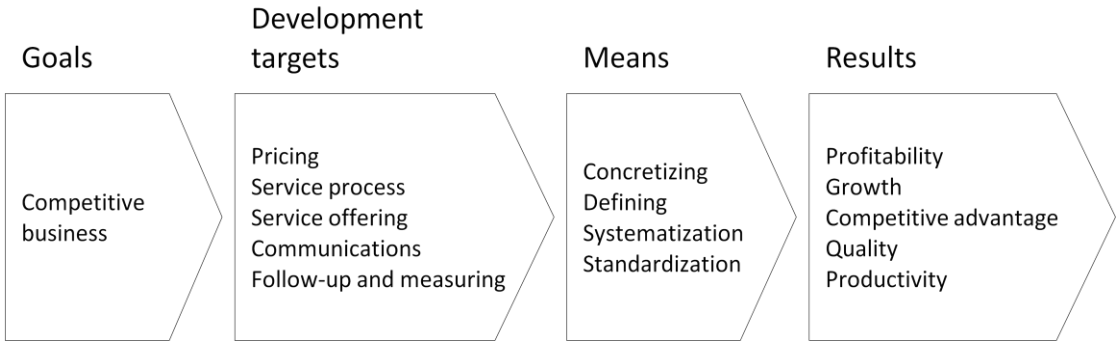

Figure 8. Productization process (modified from Jaakkola et al. 2007, 6)

Each productization process is different depending on the company’s aims as well as its strategy. Jaakkola et al. (2009) stress that companies should plan and carry out their service productization project based on their own demands, starting from their own needs. According to Jaakkola et al. (2009, 3-6) the productization process consists of seven different stages: 1) preparation; assessing the customers’ needs and the ways in which they are answered, 2) defining the service; the structure, contents and process of the service, 3) specifying the degree of standardization, 4) concretizing the service (service description, brochures etc.), 5) selecting the principles of pricing, 6) following-up and measuring the success and quality of the service, 7) and anticipating the needs for continuous development. Sipilä (1996, 37) also emphasizes marketing and piloting as additional stages that should be included in a productization process. (Valminen & Toivonen 2007, 4.)

In this thesis the productization process is described based on the steps defined earlier by Valminen and Toivonen (2007) with addition of marketing dimension and testing and piloting steps Sipilä (1996) has described in his process description.

4.1 Preparation

Before going into details with service productization companies should define the starting point for their operations. The goal is to define the customer segments and their needs and requirements; what kind of services are needed and what are the needed resources for producing them. Target segment should be defined properly in order to target the resources efficiently. It is also easier to market the service for specific target group and stand out from the other similar services. (Lehtinen & Niinimäki 2005, 45-46.)

Productization is always based on company´s business and marketing strategies, these should be taken as close part of the productization process as they might also need some changes made. Product strategy requires knowledge from markets, competitors, customer and about company´s own know how and technological potential. It is also important to define everyone that are involved in the productization process and make sure they are committed to the process. Service companies have to know exactly what they are selling and to whom, even though services are intangible. Product strategy helps to group different services and their contents according to target customers. The more abstract the service is the more important it is to have a clear product strategy and product catalogue. (Sipilä 1996, 34, 50.)

Preparation phase also includes the definition of the company´s competitive strategy. The company can compete with quality when the aim is to produce high quality service and to target it to such audience that is also willing to pay a higher price. The other option is specialization when the aim is to serve one particular niche market with very specific and unique service offering. This enables also more flexible and higher pricing models. The third option for competitive strategy is price. Company aims high volumes with lower prices; this is made possible by standardizing the service as much as possible in order to lower the production price. (Sipilä 2003, 261-264.)

The last phase of the preparation is to make a detailed plan of the whole productization process, where the goals, tasks and schedule are well defined. When planning the schedule one should set checkpoints and take into consideration the additional work like preparation, modification work and measurement. Also the personnel specific factors should be noticed, their workload and other commitments. Planning should be done as thorough as possible but be also able to make changes along the process. (Sipilä 2003, 261-264.)

4.2 Defining the service

Defining the services is the most essential part of the productization process. This phase starts with analyzing the service offering, service grouping and compiling a service register, after which the detailed productization of selected services can be done. (Jaakkola et al. 2007, 9.)

Before going into details with individual services a company should analyze its service offering in order to indentify the services in which they want to concentrate first and put most efforts, analyzing also helps to recognize possible deficiencies in service offering. First the existing services are hierarchically grouped into main service groups and sub groups. Focal services are defined according to their specifications, resources, quality and their meaning for the company. This helps the company to recognize possible development needs for new services. Profound analysis and planning enables the productization process to become a seamless part of everyday operations lowering the costs and efforts needed in the process. At the end of the service offering planning company is able to compile a basic service register that can be published for customers and other stakeholders. Service register should be compact including max four service groups that include three individual services. Service groups can be divided according to field of know-how. (Jaakkola et al. 2007, 9-10; Sipilä 1996, 58-60.)

Development of individual services starts after the definition of the service offering is done. The goal of this development work is to define the service packet including the purpose of the service, the core service and support services. Next is the definition of benefits from the service for the customer. Also market potential and sales estimates as well as main competition should be defined. Important part of service development is

the definition of service process with different service phases and participating personnel and other needed resources like using partners with compiling the service packet. Service processes should be described as visual flowchart where the different stages and relations of the service production can be seen. The service flowchart can describe also the parts of the process where the customer or some third party is participating. Good tool for making service flowcharts is the Blueprinting method described in chapter 3.2.2. (Jaakkola et al. 2005, 11-17; Sipilä 1996, 64.)

4.3 Degree of standardization and modularization

Service package can be seen as two different things. Firstly, it can be a synonym for product, this emphasizes the multiple elements from which the product consists. Though, these elements cannot be sold separately. Secondly, a service package can be divided into core services and support services, and call this combination as a product. This kind of service partition also leads to standardization and modularization. It is normal that companies develop three different service packets: 1) stripped-down service packet for small customers, 2) basic service packet for medium sized customer and 3) special service packet that is built from basic service, extra modules and customized part according to customer needs. (Sipilä 1996, 64-65.)

In knowledge intensive service companies, one strategically important question is the level of service customization and service standardization. Part of the service definition work is to make the decisions about possible customer specific tailoring, are the services composed of different modules or are the service packets entirely predefined. The aim with service standardization is to make a service or service process duplicable or repeatable with the help of some systematic method or technology. Companies need for resources is depended on the decision of level of standardization. If the company is selling highly customized services the need for experienced professional is higher than with standardized services. (Jaakkola et.al 2009, 19; Sipilä 1996, 64.)

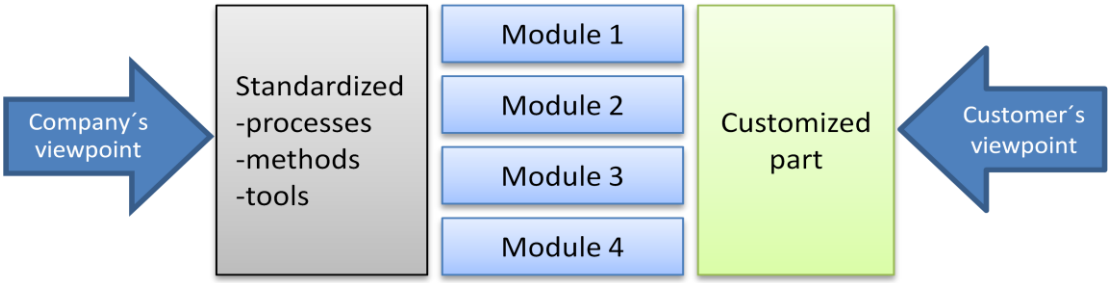

Figure 9. Modular service offering (modified from Jaakkola et al. 2009, 20)

Service offering can be seen as an entity that is composed of standardized part; different modules and customized part (see Figure 9.). Individual needs of customers can be taken into consideration with small variations in the core service, or through modularization. When using modularization, customization is achieved through different combinations of modules, each component being provided in a systematic manner. Customers tend to see the service from the customized point of view and thus think of the service as more customized than it really is. Besides the service elements that are visible to the customer, productization may concern the service company's internal processes. Traditionally knowledge intensive services have been highly customized. It is common to end up in unique situations where solutions must be strongly based on customer needs. The challenge of productization is to maintain this customer perspective. Usually productization in knowledge intensive companies is carried out by developing working practices and working processes, and by creating basic structures for those parts of the service content which are made case-specific. (Sipilä 1996, 69-70; Valminen & Toivonen 2007, 3-6.)

Tools for standardized services are usually technological solutions or some other systematic methods that allow the company to produce part of the service process every time the same way from one customer to the other customer. This makes the service process more efficient and not so depended on particular individual. These methods or tools can mean fixed processes or guidelines, information systems or databases, standardized methods like analysis tools, planning tools etc. Technologies used to standardize part of the service offering can be also be acquired outside of the company, the value comes not from the tools themselves but the added value they bring into the service. (Jaakkola et al. 2009, 21.)

4.4 Testing and piloting

During the development process of the service it is recommended to test its suitability to the intended need. Knowledge based services are usually developed in co-operation with customer and service provider. This kind of systematic development process enables the real live testing or piloting of the service already before service is commercial. It is though common that services are kept secret as long as possible because companies are afraid that they might be copied. This secrecy is many times over exaggeration, as much of the service development is about internal processes and training employees, and as such is very difficult to copy. New service should be developed and tested with one or more customer as continuous process in order to better meet the real customer needs and requirements. When arranging pre-commercial pilots, possible defects or irregularities can be found and adapted according to the service needs before going to the paying customer. (Jaakkola et al. 2009, 3; Sipilä 1996, 31.)

4.5 Marketing and concretization

Productization and marketing are both large individual entities, but still very much tied to each other and such should be handled parallel. Companies should pay much attention to the activities that are needed in order to have a complete, consistent and sellable service, also called as an extended product. The best outcome is achieved if productization and marketing tasks are performed in cross-functional teams. This is extremely difficult especially with high tech services, engineers have hard time becoming market focused. With marketing related tasks company concretizes the means the service is communicated for the customer. The aim of concretization is to make the service credible, distinguishable and easy to understand. This is achieved with outbound productization efforts and which in practice mean various marketing related tasks as illustrated below (Mohr 2001, 24; Simula et al. 2008, 8):

- Branding and naming
- Warranties and technical support
- Advertisements, brochures and white papers
- Customer references

• Contracts and/or license terms

• Sales tools and pricelists

Productized service can be branded i.e. give the service a name and individual visual look with support materials. Brand can be seen as a group of values that make the promise for certain service level, it is an image of service identity. Good brand facilitates selling efforts and adds customer loyalty. To be able to create a coherent company image and service brand it is of utmost important that personnel who are working with customers have clear message about company and its services that they use in communication with customers and stakeholders. (Jaakkola et al. 2009, 26.)

Quality of service is hard to prove because of the intangible nature of the services. Image of quality of service can be created by using elements that make service more tangible. These elements can be customer references and use cases made from other customers, for example architects can show blueprints and pictures from their previous works. In high tech markets for example software services can be concretized by careful branding with naming the service and giving it a clear functional description and making brochures and sales packet. Demonstrations and trials are very often used with ICT-based services. Phillip Kotler has also defined so called flagship services that are used to create interest in customers. Flagship services are services that the company can do exceptionally well or it can be well known expert so-called super professional whose personal image is used in company marketing. (Jaakkola et al. 2009, 27; Sipilä 1996, 87-89.)

Equally important to external marketing efforts and sales is the internal marketing, it is a prerequisite for successful external and interactive marketing. Baron and Harris (2003, 123) define internal marketing as: “those activities that improve internal communications and customer consciousness among employees, and the links between these activities and external market place performance”. Grönroos (2007, 383) also emphasizes the role of employees in service marketing by stating that: if goods, services, planned marketing communication, new technologies and operational systems cannot be marketed to internal target group, marketing to external customers cannot be expected to be successful either.

Employees' knowledge about services and attitude can be developed by sharing information by means of brochures, meetings and organizing trainings. Emphasis on the need to view people, functions and departments as internal customers, to whom internal services have to be provided in the same customer focused manner as to external customers. If aforesaid is not realized, employees ability to provide high quality service to company´s "real" customers is seriously jeopardized. (Grönroos 200, 384.)

Deriving from the fact that the nature of many services´ is simultaneous production and consumption means that customers are actively involved in the service delivery system and frequently exposed to the actions and attitudes of service employees (Baron and Harris 2003, 121). Internal marketing is also human resource management, damage caused by dissatisfied service employee could be much more serious than damage caused by unsatisfied manufacturing employee.

4.6 Pricing

Pricing professional service is difficult. There should not be only one person responsible for pricing decision; it requires viewpoints and expertise from whole lot of different persons in different operations from high level management to sales and marketing, as well as financing. Pricing of the service should match the benefit or the value of the service to the customer. Concerning prizing the consequences from productization is increased possibility of service comparison based on pricing, which can lead to toughening price competition especially among generic services that can be delivered by many different service providers (Sipilä 2003, 488).

Especially in high-tech industry companies face an environment characterized by ever shortening product life cycles, with rapid pace of change and potential obsolescence of products and services. Jakki Mohr (2001, 254-255) lists nine more factors effecting pricing in high-tech environment: 1) Pressure in price / performance ratio, product performance increases according to Moore´s law with no effects on pricing, 2) network externalities, the value of a product or service increases as more people use it, e.g. Internet portals, 3) unit one costs i.e. the cost of producing the first version of software is very high compared to next versions, 4) customer´s perceptions of cost/benefit of new technology, keeps customers waiting for new enhanced version with hope of lower

price, 5) competition, especially Internet based services (Software as a Service, SaaS) the competition is fierce and it is very easy to compare prices, 6) Internet enables fast going into markets enabling options for customers, 7) backward compatibility, support for existing products, chancing standards and maintenance effects pricing strategy, 8) investments in R&D and 9) rapid pace of change. All these factors and more are making pricing decisions even more complex in high-tech environment than in conventional marketing, these factors have to be taken in careful consideration when defining company´s pricing strategy. (Mohr 2001, 254-255.)

Cost, competition and customers are the three C´s of pricing. Jakki Mohr (2001, 255) compares three Cs to three legged stool, with only two legs the stool will tumble over – the same goes with pricing – setting the price based on only one or two of the three Cs will result in unstable situation. Next the three Cs are described.

Costs of producing the service constitute the bottom line for pricing. Cost structure should not be the primary pricing factor but should be considered with the market factors. As the situation in high-tech markets is changing rapidly e.g. low-price positioning with cost advantage based on economies of scale may change quickly when new technologies arise. (Mohr 2001, 256.)

Competition should be used to benchmark company´s own pricing strategy. Depending on the company´s market position it can set the pricing lower, equal or higher than the competitors. Even with new-to-the-market product or service companies should not assume that there is no competition and set the price high. Companies should think not only the similar competing services but also the substitutive services and accustomed ways of doing things. (Mohr 2001, 256.)

Customers provide an upper limit for pricing. The benefit / cost ratio is decided in markets by perceived value of the service to the customer. It is difficult to understand customers' perceptions of benefits and costs, and should not be assumed that the benefits company holds for granted are obvious with customers. Service benefits may include functional benefits, operational benefits, financial benefits or even personal benefits. Whereas perceived costs can be monetary costs – including the price paid, installation etc. – or nonmonetary costs including e.g. factory down time for repair and maintenance of machinery or software systems. (Mohr 2001, 256.)

In addition to price paid when purchasing the product the total cost of ownership has to be taken in to considerations. Total cost of ownership can include factors like the price paid, delivery, installation, maintenance and updates, power consumption and other operating costs over the life cycle of the product. In B2B software markets the initial purchase price may account only a fraction of the life cycle costs that may include maintenance services, upgrades, support services and training services. Using the total cost of ownership in pricing strategy a company can position its services compared to competitors. Even with higher initial pricing the total cost of ownership can be lower than the competitors´ prices. (Mohr 2001, 256.)

Pricing can have different dimensions or roles depending on the chosen pricing strategy for the service. From company´s point of view pricing can be seen as a factor for profit making, or as a competitive weapon, or as a tool for guiding customer actions, price can also be seen as an important indicator of value of the service. The role of pricing as a tool for guiding the customer is emphasized with professional services as the customer is part of the service process and plays important role in the successful service process. (Sipilä 2003, 25-28; 1996, 79.)

As summarization, when thinking of pricing factors a solid consideration of costs, competitors and customers is vital in establishing a successful pricing strategy. Although all these factors are important companies should pay special attention to customer orientation in pricing because people tend to care company’s costs as their own costs when buying services.

4.7 Follow-up, quality and continuous development

Company should always target quality and continuous development in their operations. Continuous follow-up and assessments should cover the service offering as whole as well as individual service success. Productization process is usually measured with indicators such as customer satisfaction, sales volume and different financial figures. The development process should not end on success based on such indicators, but the information gained through assessments should be used to further develop the service. Continuous development cycle should be a part of everyday operations as active follow-up and measuring helps the company to become customer oriented and proactive. W.

Edwards Deming has developed an approach called PDCA cycle (Plan, Do, Check, Act) that is applied to processes to measure and continuously improve their performance. (Jaakkola et al. 2007, 39-40; Zeithaml et al. 2006, 310.)

Quality of the service is very difficult to be measured because of its intangible nature. Quality of service is generally through customer satisfaction, quality is good when the service meets the customer expectations and creates value for the customer. Service quality is realized when customer expectations are met or surpassed. Zeithaml et al. (2006, 46) have designed a tool that helps to identify the five pivotal gaps in delivering and marketing service, see the illustration below.

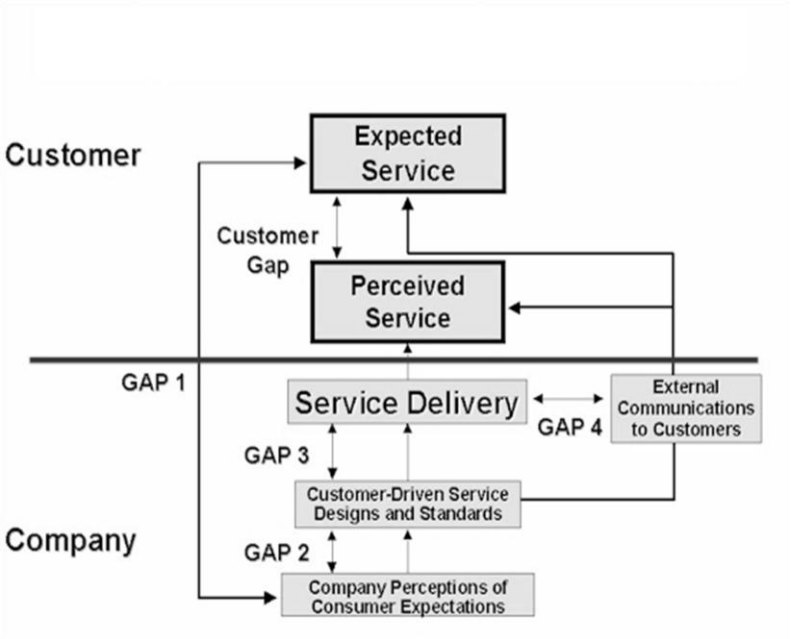

Figure 10. Gaps model of service quality (Zeithaml et al. 2006, 46.)

These five gaps may lead to the situation where customer´s service experience is not met with his expectations. The gaps and means for measurement are listed by Zeithaml et al. (2006, 33-46) as follows:

Customer gap: Difference between customer expectations and perceptions. This can be measured with customer satisfaction surveys, number of complaints, sales volume.

Gap 1: Not knowing what customers expect. This is usually due to inadequate marketing research. This gap can be tackled with customer surveys, analyzing customer feedback and reclamations.

Gap 2: Not selecting the right service designs and standards. This gap is due to poor service design and unsystematic service development process. Gap can be tackled with service piloting and continuous testing, and analyzing the customer feedback.

Gap 3: Not delivering to service designs and standards. Problems can rise from poor human resource policies, ineffective recruitment or from problems with service intermediaries. This can be tackled with quality auditions, documenting service processes and measuring production costs.

Gap 4: Not matching performance promises. Problems rise from poor service marketing communications and ineffective management of customer expectations. Can be tackled with queries to service employees before implementation of communications plan and assured through customer queries.

Quality of service is depended on how it meets the customer expectations, but the service must also be profitable for the service company. Profitability can mean the company's performance in service production, return on investment. With thorough productization process it is much easier to find the quality gaps and to measure also the profitability of the service. (Zeithaml et al. 2006, 33-46.)

5 SERVICE PRODUCTIZATION PROCESS – CASE OCTOPUS NETWORK

The purpose of the productization project is to help Octopus Network in defining its service portfolio through implementing productization guidebook to be taken as a part of its operational processes.

5.1 Background for the development work

Finnish ICT industry is dependent on the quality of the developed products and services to be successful in the international markets. Today, in the software engineering sector, Finland, as well as whole of Europe, has to face up to new competitors from emerging countries like China, India or Korea, who are able to produce latest technology (mobile telephony, cars, aerospace systems) products using high maturity processes and what is more, at very low cost. The usual reaction to this challenge is to increase efforts in order to improve quality and productivity and invest in research and development of new future technologies and services.

During 2008-2010 Octopus was participating in EU Celtic funded project called Netlab together with eight other industry and academic partners. I was working in Netlab as the project coordinator for Octopus´ activities, this role in the project resulted to the idea also for this thesis. The aim of NetLab was to develop a platform of interconnected testbeds (Octopus as one testbed) involving companies and universities from three different countries. Together with different testbeds the aim was to tackle the interoperability, the scalability, the complexity and mobility aspects as well as security and QoS (Quality of Service) requirements coupled with validation in large scale end-user testing environments. Part of Netlab project work Octopus started to develop a new service called TestingHotel that will be introduced more in next section 5.2.

The need for this kind of development project was based on the preliminary research conducted by Octopus and other Netlab partners. The findings from the research suggested that testbeds and testing services are increasingly needed. In the research we, as project consortium, did for Netlab found out that other research made by The Standish Group showed that 52.7% of the projects on Information Technology (IT) had a costs deviation of 189% more than the initial estimation; 31.1% of the projects are

cancelled before completion. A survey conducted with more than 450 quality experts in Europe shows that this trend is also noticed in European economy; for example, the 76% of the quality experts maintain that testing projects are now more important in their companies, especially for large scale projects. These facts put more pressure also for Octopus´ service productization with which we are able to tackle these inefficiencies. Also our research showed out that according to the predictions published by Gartner Group about applications development market, the market growth would be constant during the coming years. But the growth is expected to be even bigger for the testing tools market, this is also the market where Octopus is involved as testing service provider. A customer focus report, "The top application priorities in 2009", published by Datamonitor showed that the testing phase has been elected as first option more than 60% times. That is why, to keep leadership in those domains in which software systems are very important, for example new services, the industry should improve significantly the performance on software testing and quality assurance. In general terms, current trend of the European industry consists on the application of "early-prototyping" or "hardware-in-the-loop" methodologies for product developing, in order to produce new high quality services, with low costs and good end user acceptance. Unfortunately, once more, end-to-end validation systems for this kind of services have not been developed at the same level, due to a lack of infrastructures and analysis frameworks to evaluate the performance level of these services in new environments. TestingHotel service aims to be an answer to end-to-end testing needs, by building real wireless networks for testing purposes and providing tools for the developers to do the testing themselves.

Octopus has its own technological testbed containing different technology enablers and wireless networks. The term testbed was used by Abu-Hakima et al. (1998, 68-69) in order to describe controlled network environments for test and validation for ICT services. Octopus is also connected to end-user testing environment (Living Lab) called Oulu Urban Living Labs (OULLabs), in order to provide testing with real end-users. According to Følstad (2008, 48-49) testbeds are seen as facilities for Living Labs, and are viewed as an important part of many of the Living Labs belonging to European Network of Living Labs (ENoLL). Living Labs and testbeds, like Octopus Network, are merged in order to establish environments within which users and stakeholder can co-create and validate new services. The basic idea of Living Labs and testbeds is to generate innovation, but they are also used for verification and testing – a process that brings added value to firms which need proof of concept before bringing the

product/service further in the development process. Living Labs serve as facilities for making testbed applications available to users. Living Labs may thus be divided into two main categories, namely 1) contextualized co-creation, meaning that Living Labs support context research and co-creation with users, and 2) testbed association, indicating that Living Labs serve as a testbed extension, where testbed applications are accessed in contexts familiar to the users. In TestingHotel development project the main idea was to build an environment that would combine technical testing with end-user testing, in cost efficient way to reach small developers by creating a web-based service and thus reaching the economies of scale very easily.

Nowadays more investment is needed in technology, improvement and implementation of development methodologies, processes and tools in the validation of the new services during developing cycle. Octopus TestingHotel service is focusing to be a part of this whole development cycle offering means for testing in different phases.

5.2 Development of the testing services within case company

TestingHotel project´s first aim is to set up a “self-service” testing environment for Octopus´ customers and the second aim is to connect as a part of interconnected testbed environment in order to sustain research and experimentations that will ascertain the convergence and interoperability of different testbeds on European level. This second aim indicates that the Living Labs methodology used in this development project is based on technology and the verification of service functionality. This verification is taken place with close relationship with end-users, who will be the subjects for testing solutions through TestingHotel, a setting which includes Living Labs. As such, the users are not necessary asked to innovate or participate in the development process. Rather, the users act as test persons in order to verify functionality and operability of new services under development.

Having all these data in mind, the result of Octopus´ TestingHotel development aims to satisfy service developers, operators and end users as follows:

Service Developer: An end-to-end testing performed on an environment like the one developed on the TestingHotel project, assures both the compliancy of the customer´s

system with the reference protocols and standards, and interoperability in a real wireless network.

Operators: Telecommunications operators need to ensure that the system deployed for their networks functions as expected and is compliant with the protocols and standards defined. Operators also need to assure good network performance after service deployment.

End users: The TestingHotel testbed will be interconnected to the Living Labs. This makes the TestingHotel infrastructure good to make end user driven experiments. End user will also have the opportunity to transparently access all underlying technologies through only one intermediate service provider from his/her home provider and when roaming.

The target customer, software developer, has a need to distribute and sell their mobile applications or services. The problem is how to proof the operators and application stores that the application is working in the commercial networks and is created compatible with different wireless environments. The answer to this question is TestingHotel. Octopus´ customers can conduct needed testing using different technologies via TestingHotel system by carrying out simple-made installation, configuration and self-testing to prepare their application for commercialization. Target customer is a small company, or it can be even an individual developer, that does not have resources or access to the needed testing infrastructure for its application. To be able to develop a service that meets customers´ needs it is important to involve the user into the development process. Customer can be involved differently in the innovation process in terms of quantity, quality and timing of their involvement. The most typical way of involving a customer is to carry out usability tests or market research. In the other end there is true user-driven innovation, where users, drive the innovation process, deciding the direction of the development while the R&D staff in the company are facilitators of that process. In the development process of the case company´s projects in the past, target customer has had too little role and the development work has been more or less led by the technologies that are thought to be important by Octopus.

It is common for software and service development projects; the project is initiated by typing a broad definition of requirements, as was done also in Octopus. Thereafter

began the coding itself. At some point, it was planned to call up a focus group to provide feedback about the concept, and then continue up for the beta, or even directly to commercial version. The launch was meant to be supported with a big marketing campaign, and it was hoped that the service would be successful. This was the whole development plan, including the productization part. The whole process was all about the different technological features that would be implemented in the system.

5.3 Development of productization process for Octopus Network

This section aims to answering the research question number three concerning the possible critical gaps, obstacles and success factors that have to be taken into account with the service development and productization process in the case company. The interviews conducted to the professionals representing different fields of expertise revealed that everyone had relatively clear idea about productization, and it was more or less similar to the theories written about productization by Moisio (2005) and Parantainen (2007). The viewpoints did not differ much regardless of the backgrounds of the interviewees. However, it could be seen that if the interviewee had more of a marketing and sales background rather than technical, they pointed out more specifically the customer's point of view, whereas the persons with technical background were more product and service oriented. In addition, the interviewees with technical backgrounds had the customer need in mind but from a bit different angle, putting pressure on the features for the customer. An example from the developer's point of view as follows: "A technology is packaged as a sellable product or service which brings benefits for the customer, after which the product is further developed.". Another technology oriented description given as follows "Making first prototypes of products and then developing sales packages of those." The interviewees with sales and marketing backgrounds defined productization in a more customer oriented manner exemplified in the following statement: "Productization starts from the product planning. As the product has to be designed for particular market and for particular customers the customer needs and their problems which we are going to solve has to be known. You have to find out why somebody would buy and use your product. Essential part of productization is to define and document all kinds of product specifications and service processes, in order to have a package that is easy to sell and easy to understand and buy". In my opinion, these descriptions reveal the fine nuances in viewpoints

between technology people and business people. The core of the interviewees' views is illustrated in the quote from one interview below:

> *"Productization is a bunch of tools / methods / or ways to bring correct service / product to the correct markets / customers with correct price and tack.*
> *- Interviewee*

The differences between productization of physical products and services are seen from the needed actions point of view that varies between physical products and services. There are several physical dimension and different kind of specifications which one has to measure or consider when making a physical product. In addition, manufacturing, logistics, sales environment are the aspects that bring totally different elements to a company's productization plan, while making a physical product versus service. For example, today one needs to think more about environmental issues (green values) and political issues (e.g. Fair Trade) which have impact on how people react to and think about a company's product and the company itself. These kinds of elements are tools which one can use while building the brand to the product and company and are easier to an extent to show with physical products than with services. The basic idea of productization is similar between service and physical product but the tool box and aspects to be taken into consideration vary. Subjective user experience and human interaction are more characteristic for services than physical products. A bad service can be handled or even repaired during the service encounter unlike the faulty physical product.

In view of the service that is under development in Octopus the following description of the differences between service and physical product is valid: a service is available in particular place or from the certain source (SaaS) and does not evoke ownership, whereas product is a concrete device that can be owned or rented. This definition leads to the difficulties of whether to put software into the category of a service or product. Software can be both, if one buys an application in a box burned on a CD-ROM it can be seen as a physical product but if one uses the software through Internet and no ownership is generated it is a service. With the case company offering making the categorization is fairly easy, Octopus's offering consists of services. The software that Octopus is developing is a service because it is delivered through the Internet and no ownership of any kind is created during the service process. With software-as-a-service

that is used through Internet you are able to follow and analyze your customer needs and experiences quite easily and fast. One can quickly change and modify the product to better respond the customer's needs. One can rapidly find new markets and customers and change the marketing mix and supply methods (e.g. using social media) with SaaS based services. These characteristics of software available globally through the Internet put also lots of pressure on the extra issues that has to be taken into consideration such as security issues, IPR and localization.

The benefits from the productization were recognized also by the interviewees. By the aid of productization work, it is easier to sell a product and/or service. Comparison to the mass production was also made, by a respondent in him pointing out that "productization helps in planning and measuring the need of resources since the structure of product is well defined and thus easier to keep under control", and noted that the same goes for services too. From the discussions with the respondents it can be derived that when one knows the service and target markets thoroughly one can sell more, and with less efforts. It is also easier to adapt your service offering according to the different needs of different market segments, and find new additional or enhancing services to sell. Productization is also one of the important tools to build your company brand.

5.3.1 Case company gaps and success factors analysis

For the small company such as Octopus Network an extensive requirement specification and major development projects based practices can be too heavy. If the company fails with the first guess, the small company does not necessarily have the resources to do the same amount of work with a new development project. Several unnecessary features could have been developed , which cannot be used but which have taken the time and money.

Gaps

In this section I will deal with the factors and gaps that need development. As a basis of this analysis I use broadly the gap analysis model by Zeithamlin, Berry and

Parasuraman (2006, 46; see Figure 10), and the results from the interviews conducted for this thesis.

Octopus´ first challenge relates to the gap with customer need analysis for testing services, which has not been properly managed during the whole history of the company's operation. The reason for this is not only Octopus's own inefficiency but also the fact that it is not easy to acquire this kind of information from the customers. For example, every year Octopus has made a query about its testing services and the need for them among wide range of customers and other actors. However, the response rate has been low, only totalling some 20 – 30 %. According to the gap analysis model the first gap between service providers and customers stems from the fact that the service provider has the wrong kind of image of the customers' needs.

This gap is also recognized by the interviewees. It was pointed out in every single interview that the focal point in service development is to understand the market needs and more precisely the customer needs. In addition, it was found evident by the interviewees that everyone knew how this should be done i.e. finding out who the target customers for this service are. These responses raise several questions, including the following: What are their problems that we are trying to solve with this service? How are we going to solve these problems, which are the features for the service we are developing and in which order we are going to implement them? How are we going to price the service? How will we launch the service to the markets? The issues discussed above are prominent also in the quote from an interviewee below:

> *"It is essential to productize an adequate service to one segment at the time. There is no idea in trying to develop a service that would satisfy every customer and solve the problems in every customer segment." –Interviewee*

The second "danger point" in gap analysis narrows for Octopus. When the need analysis has been overcome, and Octopus offers a service that customers do not either need or want, Octopus should change the course with its activities to meet the customer need. This way the gap between prevailing perceptions of management about the needs of the customers and the service delivery itself is narrowing; Octopus´ organization structure is very lean and very transparent so the messages inside the team is transferred very well. However, it must be noted that the gap narrows only in that case that the Octopus

team is able to correctly interpret the messages from the customer needs and accordingly can steer the operations in the right direction based on this information.

One important issue was raised frequently in the interviews, i.e. the fact that productization cannot be properly carried out unless one really understands the customer need. The product or service and its benefits to customer should be easy to understand also by the customer. When the service is built according to the needs and productized into a sellable service packet, it is also easier to amend the service to meet the changing customer requirements. With Octopus´ testing environment the possibility to use the services (SaaS or the test network) into something else that was originally intended for is likely, and it has been done quite a few times. Customers have done something else with the testing services in the network that it was originally sketched for. This does not matter as long as the customer is happy. However, in the long run it is impossible to sell something that nobody really needs as such. This gap can be overcome with including continuous follow-up and analysis of customer behavior into the productization process and systematically gathering customer feedback.

> *"Productization is always a living process. Markets are changing with a fast pace, especially with software based service development" –Interviewee*

The third gap related to internal processes and organization poses a risk to Octopus to an extent. Because the organization is small the resources used into the development work are limited. When the resources are tied to many different activities it is evident that some of the activities are handled with less priority than others, especially documenting the work that has been done is many times forgotten. When productizing services, modularization and repeatability cannot be achieved unless there is adequate documentation and guidelines that describe the whole service process, including possibly needed tools and service intermediaries. The interviews revealed that no matter how small the company is, there always have to be clear distribution of work. One person is needed that is responsible for the whole development or productization process, and makes sure that everything is done according to plans. This aspect rises also from the interviewee quote below.

> *"When following the designed development process and service design is well documented, you can optimize your costs and R&D time when you do the right things at the right time at agreed way." –Interviewee*

In the next phase the widening of the gap is again a great risk when the external communication about the service offering starts in the hope of acquiring new customers. Octopus´ operations and services appear to be so ambiguous that they are not easy to dress up into a simple form of message. With this situation, the message about the service offering may become increasingly blurred with external market communications, and can result into a communications failure due to the gap between the service offering and customer expectations. If the services are well productized the gap between external communication and service delivery will not be a problem, assuming the technical employees and the sales and marketing employees have been in close dialogue. As one of the interviewees pointed out, the message about the service and performance promises many times tend to change and grow during the sales pitch to the customer. According to the sales experts interviewed it has happened that when marketing Octopus services as comprehensive package the customer has noted a few missing parts when comparing the service brochure to the implementation. However, this gap is not as dramatic as one could think. Often the communications with the customers happens in direct personal contact, where there is the opportunity to present the offered services in a comprehensive manner and according to needs discovered during the conversation with the customer. This enables the sales person to amend the message according to the customer needs.

Everything goes well after the stage is reached where the actual production of service is happening, when the service provider and the customer that seeks to be served meet and needs are fulfilled. The customer gap between services provided and the perceived quality of service does not seem to be alarming according to the customer satisfaction surveys conducted yearly. The surveys reveal that the satisfaction for the Octopus services receives an average of 3.5 points, on a scale of 1 - 5, from the customers. However what is alarming is the fact that inquiries receive responses from only a fraction of the customers. On the basis of this lack of reactions, it can be concluded that the activities of Octopus are not found interesting by a large number of customers. Generally speaking, the gap between the service provided and the perceived benefits and quality is not as emblematic of the problems within the organization since

customers that are not satisfied with the services do not care to complain. If customers do not ask for better service, perhaps the services are not needed. Customer may even be satisfied with the service albeit the service is not designed for their needs. For the solutions to this problem I am suggesting a more detailed mapping of the customer needs for specific service, and a personal communications about services and their potential uses. The most important task to do at this point is to review the whole service strategy, and open-mindedly rethink the whole supply of services taking into account the customer perspective. The quote below reveals that customer can be happy with the service despite of the misunderstandings between the offering and the needs.

> *"Customer was happy with the service although they used it to the different purpose than it was originally meant for." –Interviewee*

Systematic and well organized productization helps companies to deliver high quality services to satisfy the exact needs of the customers. The service quality gap model works as useful part of the productization work, it helps to identify the potential black spots already during the development process and especially when the service is already commercialized and out in the markets.

Challenges

In addition to the gaps with service productization process there can be real challenges or even obstacles to the process. In view of the challenges and obstacles, the interviewees brought out a few things that were typical for productization in the case company. Lack of resources was mentioned by the interviewees when asking about the obstacles or why systematic productization has not been done before. Regarding the resources, the lack of time was found to be the main reason for the Productization to fail. Interviewees pointed out that productization is seen as a time consuming process and in a small company such as Octopus the concentration has been lacking. The main challenge, according to the interviewees, has been the fact that no one person has been assigned as responsible for the whole productization process. There is a need for product manager with all the needed support and financial resources assigned by the management, in order to make it possible for him to take the responsibility for organizing the work and assign tasks for other employees within the organization. The lack of commitment to the productization work has been the biggest obstacle within the

case company; productization has been seen as extra work that "someone" should be doing, on the one hand. On the other hand the management acknowledges that the reason productization has been missed is the complexity if the service offering, there has not been a clear service strategy. The complexity of the customer cases has been one factor that has been keeping the Octopus' service offering as customized mode. There have not been too many similar cases where the productization would have initiated naturally. Service offering has been created case by case according to the customers' wishes and there has been a feeling among the employees that it is not possible to productize these services. With productization these customized services could have been built by drawing from the readymade service modules if the productization work had been done in time. Markets are changing rapidly and customers change the service provider more easily. Customer loyalty is hard to keep. One needs to update and change your service constantly to follow your customer needs – long term planning is more difficult. However, one needs to be loyal to some of the products decisions made instead of doing everything in accordance with the customers' wishes. One need to define the target market and not to try to kiss the whole world, from the productization point of view this requires extra effort to keep the process straight.

> *"Productization is successful only if the "recipe" is well defined and the real customer needs are understood correctly"- Interviewee*

The challenge with technology based services is to keep the R&D function under control, to keep the service simple enough that also the customer can understand it. Simultaneously, the control will facilitate the task of curbing the R&D cost level. Planning is difficult and takes time, and as the implementation of the original plan varies during the work which consumes more time, it is important to have the structure for the productization work clear all the time.

Success factors

One of the themes during all interviews was to find out the interviewees' opinion about the key success factors for the case company's service productization. The answers were different due to the respondents' different perspectives and background, but there were also some common elements that came up during the interviews. The first common elements were the need for everybody's personal commitment to

productization work, and to get R&D and marketing people to work together. Next common element was to hear and understand the customer's needs. According to the management, there have been problems in genuinely understanding the essence of the value proposition for the customer. A further common element brought up in the interviews was choosing the right services to work with; there should be clear idea of what services are worth working with and to further define the service concept. The success factors with productization efforts for the case company were seen related to the size of the organization and its networked operation model. The small size of the company was seen both as a success factor for its lean structure and as an obstacle from the time management point of view. When asking about the productization process and phases, all interviewees admitted that they did not have a clear picture of how the productization process should look like, and they raised a clear working process as the most important success factor with productization efforts. The clear working process requires somebody to steer the work to the right direction to make sure that everything that is needed to be done is really done in the correct manner. This steering requirement leads to the fact that a skilled product manager is needed in order to get the full potential out from the productization work.

5.3.2 Characteristics of the productization process for the case company

In this section I search and define some of the factors that are in my opinion the main characteristics for successful productization process for the case company. At the same time this section answers the research question number two. I build my ideas on the basis of the theoretical framework of the literature review, combined with the results from the interviews made for this thesis.

Deriving from the interviews I conducted it can be stated that the most important part of successful productization is involving customers in the development process from the beginning. If the productization is about already commercial service the role of the target customer is still important in order to find the suitable service package for the customer need. Involving customers into the different phases of service development and productization reduces the market risks. It may frequently be challenging to capture customers´ ideas and know-how into the service, since customers often expresses their ideas in terms of complaints or suggestions. Target customers are called as lead-users,

they are defined as those who are in the leading edge of an important market and are already experiencing the needs that will later be experienced by many other users in the same market. In addition, they anticipate relatively high benefits from obtaining a solution developed especially for their needs. One can also do “beta testing” with your service and get valuable responds from your potential customers before you do your first market launch to your service.

Productization is multi-stage process, which should continue throughout the whole service development lifecycle. When an idea is modified into a product, there is no particular phase in the process, in which the productization definitely should start; either there is no phase where it should not yet be considered. The best results are achieved when feedback from the customers is continuously parallel with the development process.

Based on the interviewees’ opinions and experiences a basic structure and starting point can be drawn for the productization process in Octopus. It is essential to understand the meaning of the service as a whole. Only when the service and its existence are understood it is possible to understand what is needed to satisfy the customer. Even though the company is small and the service offering is limited, the company has to have at least a basic service strategy. Service strategy helps the company to identify the customers and their needs, make the needed calculations and to concentrate on the best customer. The company has to think through on what the service is meant for. Why is the company developing the service and what is the goal. According to an interviewee, the company has to recognize the target customer for whom the service is provided. User queries and market research should be used in order to find the right end users. Then the service delivery has to be described. How the company is going to package the service, what is the core service that is offered and what is the additional service that supports the core offering. How can we differentiate our service from the similar services or substitutes, and what is our value proposition for our service. One key aspect is to be able to communicate all this information with simple and understandable way, so that customers would be able to understand the value of the service for their own business.

During the productization process the risk analysis should be done parallel to the development process, and one by one the risk factors should be resolved or at least

mitigated. Since the company provides services that are based on, and require, technology also the documentation and the usability has to be taken soundly into consideration. Such aspects may sound as self-evident and basic but as the interviewees emphasized frequently, in practice managing these aspects is not a simple procedure.The most important aspect that the interviews pointed out was that a product owner, i.e. product manager is needed, and he/she should be able to communicate all these aspects to the technical staff as well as for the sales and marketing staff. In Octopus this means that the product manager would at the same time hold at least two of these positions.

Productization should be taken into the process right after the decision of starting a development project. After the decision, productization should be the leading approach with the work. One of the interviewees mentions Benefon as an example by stating that: “Benefon was delayed from the markets because of the race between hardware and software. Benefon tried to make as perfect product as possible. When the hardware was changed, also software had to be changed. There has to be some point where the changes are no longer made and to stick with it. Development team and must have daily interaction with both sides. It may be that there is more of a leadership challenge than a management challenge.” Communication is product manager’s main responsibility. For a small company it is important to keep the costs under control. Productization helps to carry out the right activities for the right purpose and that way it saves the product life-cycle costs.

5.4 Workbook of productization

This section is a detachable part of the thesis and addressed directly to Octopus Network´s use, to help the process of new service development and to assist in services launched more easily. The principles and theory behind the guidelines provided in the Workbook have been covered more extensively in chapters three and four of the thesis and this is a kind of practical guide reminding about the steps to be taken with the productization process. This Workbook illustrates the basic structure for productization work that could be used also in other similar small companies with their own developments. The Workbook can be found from the appendices of this thesis.

6 CONCLUSIONS

It is no doubt or hype that productization matters for organizations of all shapes and sizes. In this chapter I draw the conclusions about how the case company can utilize the identified success factors and tackle possible obstacles to bring about a successful productization process. In other words, in this chapter the research question four is answered. Octopus has always had high objectives related to its operations both in Finland and internationally. For a small operator as small as Octopus, finding the right services to sell for the right markets is critical. Successful productization of services is a prerequisite for Octopus' existence in the future. The business cycles are intensifying which, in general, puts an extra pressure on profitable businesses and financing. For telecom companies the markets are global and there may be cost advantages for services such as TestingHotel which are scalable over the Internet and thus reach global markets. In the telecommunication industry, standards play an important role in technology and service development, since standardization bodies (e.g. ETSI, 3GPP) are making sure that the products developed comply with the standards imposed by the industry. Profound productization of services and products help also meeting the market requirements in standardization-wise. Therefore, Octopus has to pay a close attention to the conformity of its services to standards.

To be successful with productization a selection of the target customer and its needs have to be taken into account really carefully. When starting the productization process one should always remember that it needs time and commitment. Despite the fact that productization can be carried out parallel to everyday tasks, it would be wiser to assign time and effort dedicated only for productization tasks. The latter choice allows smooth productization process. In Octopus, time allocation has been a real challenge as there are so few employees it is really quite impossible to concentrate on only one task at the time, as important as that would be. The agile working methods that are widely used with software development, also within Octopus, are also suitable with productization process and should be included in the daily operations.

The interviews evidence that Octopus Network has already recognized an urgent need for productization, and had considered the productization of its services also in the past but no adequate systematic actions were made. This service development work that has been conducted in Octopus and the research conducted about productization for case

company´s use has proved that it is highly important to constantly improve operational processes and to create productized services especially in professional business-to-business service market. When the productization is included in the daily work, the development work and efforts gradually leads to the situation where standardized parts of the developed service, modules and tailored customer specific parts can be used to build increasingly customer-oriented and cost-effective services.

If Octopus wants to keep the position as a testing service provider, and excel in quality, it should go further on innovation of new services and put pressure to the productization process from the beginning of the development cycle. It is a fact that solutions to performing intensive software testing on a large scale distributed systems are on demand, because software systems control the most critical functions on complex systems such as telecommunications functions. Deriving from the experience of working in Octopus and observing the development of the telecom industry, it can be seen that if companies do not comply with market needs, evolve in value creation, and adapt accordingly what they offer to the customers and how they create and deliver their services, there is a huge risk that these companies will be overtaken by someone, or become bankrupt. Hence, being innovative is one of the most challenging tasks that companies face. The fact that innovation is not just some great invention but it also needs to bring value to its users and has to be profitable to make it as an innovation, to achieve this productization has a crucial role.

Productization of the company’s own services is difficult to undertake, unless the company has a clear business and product strategy. The desire to clarify the strategies, as well as the desire to develop one´s services is a sign that an organization continues to develop their own operations and business. The company staff should be involved in to this planning and development process, because the only way to ensure the quality of productization is the dissemination of strategies within the company. With communication and staff’s involvement into the process the possible resistance to change diminishes and people are better motivated leading to better performance.

I can draw conclusions from Octopus´ key success factors in productization based on the interviews. None of the interviewees brought up a single stage of a process as a key success factor. The key success factors that was pointed out concern personal commitment, development flexibility, and listening to the customers. Based on the work

done for this thesis I can also draw a conclusion that a well defined productization process will reduce risk of failure for new services and helps the company to succeed in the markets.

There are also some limitations related to this research, explained as follows. This thesis presents the findings based on the literature review and interviews conducted to professionals working for or with Octopus Network. The thesis discusses the following two questions in particular: 1) What are the key success factors and possible gaps in productization?, and 2) How would the productization look like for the case company? The research topic can be examined only preliminarily in this context due to the changes taken place with the case company and the development project. In time of the finishing this thesis the situation with the development of TestingHotel has changed. To be exact the whole development of TestingHotel is in hold. The future of the TestingHotel services is depended on the other organizations working in the area of testing. The basis of the TestingHotel service will possibly be developed further by a third party, but in a slightly different orientation as an open source testing platform. The work done for this thesis can in no means be seen as trivial because the findings of this thesis are applicable also in other development work and services. This was an unexpected change of situation during the thesis process, but has minor effect to the research theme.

Further development possibilities are unbounded. Productization could be analyzed from a huge number of angles. One interesting point that arises from the recent decisions around TestingHotel development is the Open Source world and the role of productization in that context. Open source methods are increasingly being applied also in other fields of business than just software, such as biotechnology.

To summarize it is almost impossible to write one thesis that covers all aspects of productization. However, through this work I have learned a lot about the complexity involved in successful productization and I hope that readers of this thesis also get benefit from my work.

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INTERVIEW THEMES APPENDIX 1

1. Interviewee and background
2. Experiences on productization and/or product management?
3. Define productization in your own words.
4. Service vs. physical products productization, are there differences?
5. What should be taken into consideration with productization?
    a. Something especially with productization of SW based services
6. Benefits and possibilities of productization?
7. Challenges of productization?
8. Software R&D and productization; at what point should the productization be taken into the SW development process? How should it be managed in parallel with technical development?
9. Case Testing Hotel/Octopus productization process
    a. What should the productization process for Octopus include?
    b. How do you think TH productization should be dealt with in organization with limited resources?
    c. Testing hotel SWOT (Strengths, Weaknesses, Opportunities, Threats)?
    d. What are in your opinion the critical factors with TH productization? Or more universally with SW/Saas productization?
10. Something else you want to say about productization or TH? Or anything else even remotely connected to this subject.

WORKBOOK FOR PRODUCTIZATION

Octopus Network

ABOUT THIS WORKBOOK

This workbook is aimed at helping you through the stages of service productization. The workbook was created as a part of Master's Thesis work for Octopus Network. The purpose of this workbook is to make the service creation and development within Octopus Network smoother. With the use of this workbook in parallel with service development or when productizing already existing services the employees of Octopus Network can rationalize their work and company´s offering. This workbook is meant to be used in conjunction with the thesis that gives more detailed descriptions about the working sections. It is my hope that this workbook will prove to be a reliable and helpful tool for Octopus Network as well as all the others who turn to it.

This workbook should not be taken as an inclusive guide for productization, but merely as skeleton for the productization work and can be modified according to one´s needs.

Workbook for productization is constructed based on the literature references listed at the end of the paper.

Janne Ylitalo, Oulu 2011

CONTENTS

SERVICE PRODUCTIZATION PROCESS

Productization is about concretizing services in a way that they obtain the characteristics of a product. Productizing is also a process where service´s content, purpose and price is defined and packaged into systemized service offering.

1 PRODUCTIZATION PROCESS STARTING POINT

Productization process starts with defining the basics of the service and service process. The main thing is to define the customer segments and customers, what kind of services should be offered and what are the needed resources.

_____

_____

2 DEFINE THE TARGET CUSTOMER

What is the target customer segment for this service?

_____

_____

Who is the target customer? List at least a couple of companies.

_____

_____

What are their needs and problems?

_____

_____

3 ANALYZE AND DEFINE THE SERVICE OFFERING

Analyze your service offering and put the services into service groups. Make four groups at the most and maximum 4 services each.

_____

_____

Identify focal services. Choose which ones you are going to productize according to their specifications, resources, quality and their meaning for the company.

_____

_____

Define the chosen services. What, whom and how. Service benefits for the customer.

_____

_____

Define the market potential and sales estimates as well as main competition or possible substitutes.

_____

_____

Define the service package including the core service and support services. Which are the customer requirements that are transferred into featured services that can be modularized?

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_____

Define the standardized part of the service.

_____

_____

Define different service modules.

_____

_____

Define the customized part.

_____

_____

Define the service process, use blueprinting method to illustrate the process.

_____

_____

4 TESTING AND PILOTING THE SERVICE

Testing and piloting the service should be done in cooperation with the pilot customer. You should find out does the service meet the customer requirements and needs? Implement customer pilots.

Name of the pilot company. Name, and contact details of the contact person.

_____

_____

Planning the testing and piloting schedule and process.

_____

_____

Found bugs or development suggestions

_____

_____

5 CONCRETIZATION AND MARKETING

The aim of concretization is to make the service credible, distinguishable and easy to understand. Branding the service or service line is a good way of concretizing with distinguishable visual look and supplementary material.

What is name of the service? Is the service part of the branded service line? Is it possible to make up a brand name for the service or new service line?

_____

_____

_____

Internal materials:

Construct service documentation. Make an internal service description, which includes at least following things:

- Service introduction
- Service description
- Core services
- Supporting services
- Additional services
- Related services
- Unique selling points
- Customer segment
- Benefits
- References
- Pricing
- Key elements and features of the service for customers point of view
- Service delivery time
- Service responsibilities: product manager, support personnel

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_____

_____

_____

External materials:

Construct documentation in the form of service brochures, service white papers, construct a case study e.g. about the pilot customer case that reference the service.

_____

_____

_____

Define drafts for quotations, contracts and other legal documentations (license terms etc.)

_____

_____

_____

Price lists for service packet (if public)

_____

_____

_____

6 PRICING

Establish an easy-to-understand fixed pricing for the service offering or for the service package. Pricing determines the desired prize image for the service.

Construct a pricing strategy for the service i.e. basic ideas and objectives for the pricing.

_____

_____

What kind of pricing models are used?

_____

_____

What is the pricing structure for the service? Pricing level for the core service and possible modules and customization?

_____

_____

Set pricing levels per customer segments.

_____

_____

Who is responsible for the prizing?

_____

_____

Are there possibilities for discounts, when, why and how? What about regular customers, is the pricing the same?

_____

_____

What prices are made public in price lists, if any?

_____

_____

Deviations from the basic pricing e.g. pricing for partners, how these are handled and who decides?

_____

_____

7 FOLLOW-UP AND FURTHER DEVELOPMENT

Actions plan for service success and quality measurements.

How is customer feedback gathered? When, how and by whom?

_____

_____

What measurements are used to ensure the quality of the service: customer satisfaction queries, sales volume trend etc.?

_____

_____

How the customer feedback is handled, how are the possible bugs and improvement suggestions taken into the development cycle?

_____

_____

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