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VAHTERUS PRODUCTIZING PROCESS

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VAHTERUS PRODUCTIZING PROCESS

The main objective is to build practical and efficient productizing process. The process shall consider both new product development (NPD) and development or modification an existing product. The thesis shall examine existing organization and productizing processes. The aim is to develop productizing process that will support existing organization and processes. Also the thesis will study management of project such as productizing.

KEYWORDS:

New product development, Productizing, Rapid productizing, Project management

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VAHTERUS TUOTTEISTAMISMALLI

Päämääränä on kehittää käytännöllinen ja tehokas tuotteistamismalli. Malli sisältää uuden tuotteen ja tuotekehittämisen tai –muunnelman olemassa olevaan tuotteeseen. Opinnäytetyö tarkastelee olemassa olevaa organisaatiota ja tuotteistamis malleja. Tavoitteena on kehittää tuotteistamismalli joka tukee olevaa organisaatiota ja prosesseja. Lisäksi opinnäytetyö tutkii tuotteistamisprojektin johtamista.

ASIASANAT:

Tuotteistaminen, Tuotekehitys, Projektinjohtaminen

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LIST OF ABBREVIATIONS (OR) SYMBOLS

B2B	Business To Business
CEO	Chief Executive Officer
COP	Customer Order Point
ETO	Engineering-To-Order
OEM	Original Equipment Manufacturer
PIC	Product Innovation Charter
PLM	Product Life cycle Management
PO	Purchase Order
PSHE	Plate & Shell Heat Exchanger, trademark of Vahterus.
MTS	Make-To-Stock
NPD	New Product Development
RP	Rapid Productization
R&D	Research and Development
TLT	Technology, Quality and R&D (Teknologia, Laatu ja Tuotekehitys)

1 INTRODUCTION

This thesis work is made for a company Vahterus Oy. The company designs, manufactures and sells welded plate heat exchangers for demanding customers all over the world. At the moment Vahterus is the greatest pressure vessel manufacturer in Finland when quantity of manufactured units is considered. The managing board of Vahterus has set the target to reach 30% average annual growth in both turnover and number of products. The big growth of the business causes evident needs for the company to develop effectively its internal processes as well as new products and services for customers.

Year 2015 Vahterus is celebrating the 25 years since establishing. The CEO Mauri Kontu is the father of PSHE technology and has been involved in the company from the beginning. Growing from the very beginning of Vahterus to 250 employee global enterprise has taken lots of effort and ability to believe in products.

Picture 1: Vahterus Oy factory at Pruukintie, Kalanti.

Vahterus has always focused on understanding the customers and on listening to them. For Vahterus it means developing better, innovative solutions for heat exchange in cooperation with the customers. In the end, it is the customers who pay the salaries of both the staff and the owners. What is remarkable and distinctive about Vahterus is the extraordinary management of growth and know-how and the way the company continuously solves challenges and bottlenecks coming its way. Since the company's annual growth has been measured in two-figure numbers for 25 years now, it's no wonder that Vahterus has had to face continuous challenges in production, sales, HR, technology – in just about everything. Solving these in such a great manner could only have been done with determination, insight and successful investments in know-how and expertise. For this we have the excellent management and leadership to thank. (Kontu A. 2015, 3)

1.1 Background

Productizing process is an excellent expedient for the company to direct its development efforts for improving the ability to compete in the market. From this viewpoint it's important to understand that the projects can be used as an important part of the implementation of business model. To be technology leader in plate heat exchangers all over the world Vahterus need to have systematic way to develop own products and knowledge. In this case meaning precisely developed process to maintain productizing process.

Vahterus has founded that a finished product has better value than R&D work or prototype. In this case the research work is to create process to form finished product from prototype and form R&D work efficient. Also a customer is more interested to buy finished product than incomplete prototype. What comes to buying a product, the marketing material must be completed to promote and and help the product launch. The main issue is the complexity of Vahterus products as company promotes tailor made solutions for customers. So on the the product is partly physical product and engineering work. Vahterus does not

offer services, but engineering work with additional details is consider as extra service.

R&D work group is usually gathered from different departments, e.g. sales and design departments. That also comes to the point regarding management of R&D process. It is hard to control separate people when working as a one big team. Also deadlines are not so clear either the goal to aim.

Picture 2: Vahterus Plate & Shell Heat Exchanger.

1.2 Research structure

Within this research work Vahterus aims to form productizing process which is able create new products and services and finish them in reasonable time. Research work is concentrating in following objectives:

- Productizing process.
- Business model.
- Project management.

Research work focuses on following questions:

(a) What are the most efficient productizing process and methods? How to manage these processes?

(b) What is the current situation at Vahterus? Can we combine existing processes and new methods?

(c) How to manage the most efficient way of productizing process in Vahterus?

According to research questions the thesis is structured to answer as follows:

(a) Chapter 3. Theory of productization process

(b) Chapter 4. Vahterus productizing process

(c) Chapter 5. Conclusion

1.3 Research methods

This chapter describes the methods and data used in this study to examine productization process in Vahterus Oy. Purpose of this research work is to examine productizing processes by qualitative research method as quantitative method is not founded as suitable in this case. The data can be divided into five different groups regarding three different types of productizing, business model and project management. As Vahterus has requested the research must be simple and clear to maintain widely through organization.

1.3.1 Data collection

The productizing study is divided into New product development (NPD), Productizing and Rapid productizing. NPD is considered as the most common practice of R&D and also as the frame work of developing existing and new products. The thesis is considering Fahy & Jobber 2012 and Jurgens-Kowal 2012 to form the picture of different types of NPD. However Hänninen et.al. 2012 is used as an opposition to declare the weakness of NPD.

To introduce different method productization is based on Kangas et.al. 2013 and Simula et.al. 2008 to emphasize the difference to NPD and highlight the key factors of productization. More efficient model is carried out by Hänninen et.al. 2013 and Kangas et.al 2013 known as Rapid Productization (RP). RP is basically a subsidiary of productization by presenting a completely different way to manage productizing process.

The thesis is also examining today's widely discussed topic such as business model. As the product of Vahterus is more advanced than just a bulk product it is important to understand the business model, how basically the value for customer is created. This literature is combined of Blue Ocean strategy (Kim & Mauborgne 2005) and Business model generation (Osterwalder & Pigneur 2010).

Also one key factor of successful project is management. Some clear principles are gathered from Lotado 2008, Jurgens-Kowal 2012 and Kim & Mauborgne 2005. This is very own finding of myself when I have participated organization internal meetings and noticed in some cases that the project management is loose or there is no manager at all.

Documents regarding to empirical part is based on Kontu 2012, The strategic development and story. Also a few meetings were held regarding to the thesis aim and objectives during 2015, participants were Marketing manager, Technical director and R&D director. Also reference cases were mentioned during meetings.

1.3.2 Data analysis

Reason for chosen literature was the idea to get the most recent research reports and methods of productization. Productization as concept is quite young but well researched in Finland. To show difference in between NPD and productization was also important and for that reason NPD as older concept was studied as well.

1.3.3 Reliability and validity

Fully suitable existing concept for Vahterus productization was not founded. A major part of the literature is concerning about overall business models but basically all the literature regarding productizing is based on service product offering. That is also a reason why a product of Vahterus should be considered such as a product which includes several services.

The productizing and RP concepts are consisted of current research journals and the validity shall be based on their reliable sources and literature, the idea is to find out main features of each concept and apply the best practices for Vahterus productizing model.

As subjective researcher I cannot base the empirical part on my own opinions or thoughts. At the moment I have been working as Key account manager for sales in Vahterus. My objective is to identify and examine corner stones of internal processes and conduct a productizing process for overall organization exercise by using chosen literature and documents.

2 LITERATURE REVIEW

This chapter will present most relevant theories that are important for my thesis work. The process of productization has been widely researched all around the world. As the product of Vahterus is done according to different manufacturing codes and complicated customer specifications therefore the best practice theories of productizing must be gathered. Also discussion takes place at complete business model and management of productization.

Innovation plays a key role in the long-term success for many companies. Customer-oriented companies are constantly challenged by the markets to keep their offering timely and responsive to the customer needs. Respectively, new service and new product development have widely studied disciplines in academic research during the last three decades. (Hänninen et.al. 2014, 57)

2.1 New product development

New Product Development (NPD) is a unique business activity. It is the number one way to grow profitably a business but is technically risky with uncertain markets. The level of risk varies with the type of innovation project. Odds of success in NPD can be improved by properly staffing projects with a team structure that is best matched to the risk and complexity work. (Jurgens-Kowal 2012, 35)

The introduction of new products to the marketplace is the lifeblood of corporate success. Changing customer tastes, technological advances and competitive pressures mean that companies cannot afford to rely on past product successes. Instead they have to work on new product development programmes and nurture an innovative climate in order to lay the foundations for new product success. (Fahy & Jobber 2012, 161)

NPD can increase not only business but risks. According to Jurgens-Kowal the level of risks is corresponding to project and team structure. Fahy & Jobber combine NPD program and innovativeness. It is obvious that several risks can

cause total failure, but basically the point comes to the R&D team and the way of management.

2.2 Productizing

The term productization has been previously used mainly in the context of service or software industries. The dilemma of many firms operating in the industries is to transform intangible services into more product-like, defined set of deliverables. (Simula et.al. 2008, 2)

Traditional productization with NPD is often not an adequately fast or flexible way to proceed in the commercial world today. There is an increasing pressure on companies to procedure end-to-end solutions to the market with increasing speed. The challenge in solution selling is how to productize new sales items so that they fit into the product strategy of the company and are also controllable. (Hänninen et.al. 2012, 4)

As mentioned by Simula et.al. (2008) the word productizing is rather new and usually has been attached to service or software industries. Both Simula et.al. (2008) and Hänninen et.al (2012) lead the aim to defined deliverables, where the R&D, sourcing, manufacturing or marketing is combined

2.3 Rapid productization

Especially in business to business environment companies face varying customer needs rising frequently in sales situation bringing rapid productisation as widely used industrial practice fast to answer these requests. The rapidly changing customer needs require a company flexibility and capacity to react. Ability to react with an efficient information management enables rapid productisation and increasing the customer value of the products and services. This kind of new procedure should be sought to utilize knowledge assets ensuring efficiency (e.g. Moustaghfir, 2012. Kangas et. al. 2013, 110)

Product development can be defined as the transformation of a market opportunity into a product available for sale. This is often considered as a long

process with multiple checkpoints. However time is a critical factor in Rapid Productization (RP), and many of the methods used for decision making in the traditional product development process are not applied or need to be simplified. This study addresses decision making in setting up a development project. In particular, we focus on decisions related to business reasoning of RP in small-sized enterprises (SMEs). (Hänninen et.al. 2014, 56)

2.4 Business model

The starting point for any good discussion, meeting, or workshop on business model innovation should be a shared understanding of what a business model actually is. We need a business model concept that everybody understands: one that facilitates description and discussion. We need to start from the same point and talk about the same thing. The challenge is that the concept must be simple, relevant, and intuitively understandable, while not oversimplifying the complexities of how enterprises function. (Osterwalder & Pigneur 2010, 15)

Visualizing strategy can also greatly inform the dialogue among individual business units and the corporate center in transforming a company from a red ocean to a blue ocean player. When business units present their strategy canvases to one another, they deepen their understanding of the other businesses in the corporate portfolio. Moreover, the process also fosters the transfer of strategic best practices across units. (Kim & Mauborgne 2005, 94)

Osterwalder & Pigneur (2010) has presented the most simple canvas to draw the business model. This concept has been applied and tested around the world and is already used in organizations such as IBM, Ericsson, Deloitte, the Public Works and Government services of Canada, and many more (Osterwalder & Pigneur 2010, 15).

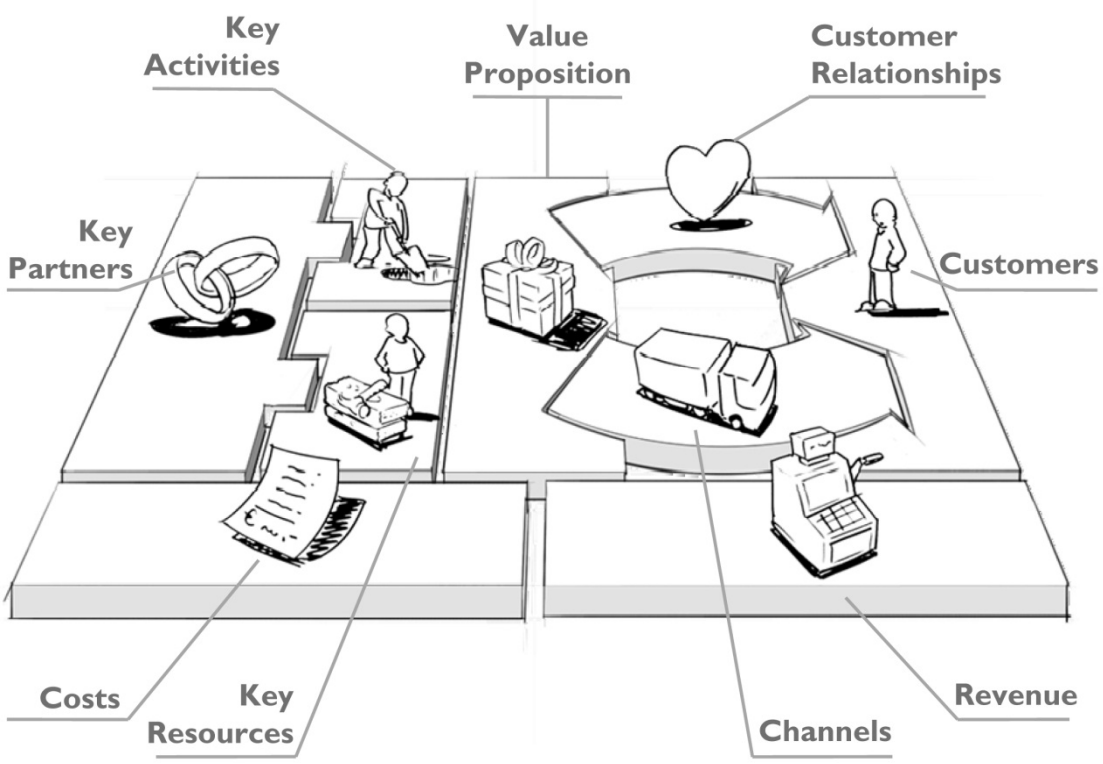

Figure 1: Business Model Generation Canvas (Osterwalder & Pigneur 2010, 18-19)

By building a company's strategic planning process around a strategy canvas, a company and its managers focus their main attention on the big picture rather than becoming immersed in numbers and jargon and getting caught up in operational details. (Kim & Mauborgne 2005, 82)

Blue Ocean strategy challenges companies to break out of the red ocean of bloody competition by creating uncontested market space that makes the irrelevant. Instead of dividing up existing-and often shrinking-demand and benchmarking competitors, blue ocean strategy is about growing demand and breaking away the competition. (Kim & Mauborgne 2005, preface x)

Kim & Mauborgne (2005) have presented the Four Actions Framework (Figure 2) to concentrate on buyer value. To break the trade-off between differentiation and low cost and to create a new value curve, there are four questions to challenge an industry's strategic logic and business model (Kim & Mauborgne 2005, 29).

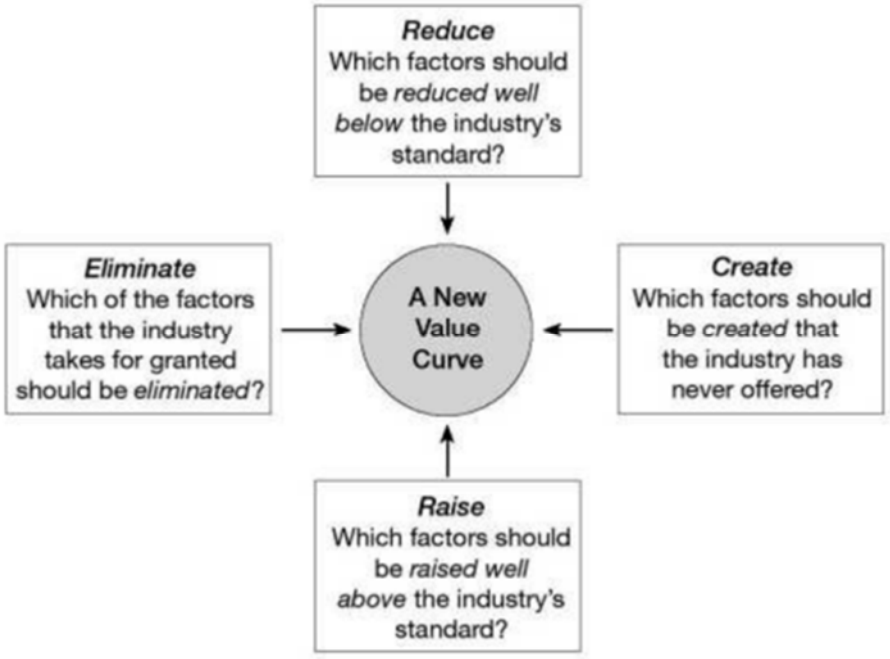

Figure 2: The Four Actions Framework (Kim & Mauborgne 2005, 29)

2.5 Management

A goal of management is to provide desired results effectively and efficiently. This is done through the use of resources in specific applications or contexts. (Lotado 2008, 3)

Innovation teams involve a highly diverse staff and may require new product development tasks that range from simple cost improvement projects to groundbreaking new technologies. Success of NPD teams depends on many factors:

- Common goals and purpose
- Organizational culture
- Team relationships
- Effective leadership

(Jurgens-Kowal 2012, 39)

A company is everyone from the top to the front lines. And it is only when all the members of an organization are aligned around a strategy and support it, for

better or worse, that a company stands apart as a great and consistent executor. (Kim & Mauborgne 2005, 171)

Kim & Mauborgne have established a Fair Process model to build execution into stragy by creating people's buy-in up front. When Fair Process is exercised in the strategy-making process, people trust that a level playing field exists. This inspires them to cooperate voluntarily in executing the resulting strategic decisions. (Kim & Mauborgne 2005, 175)

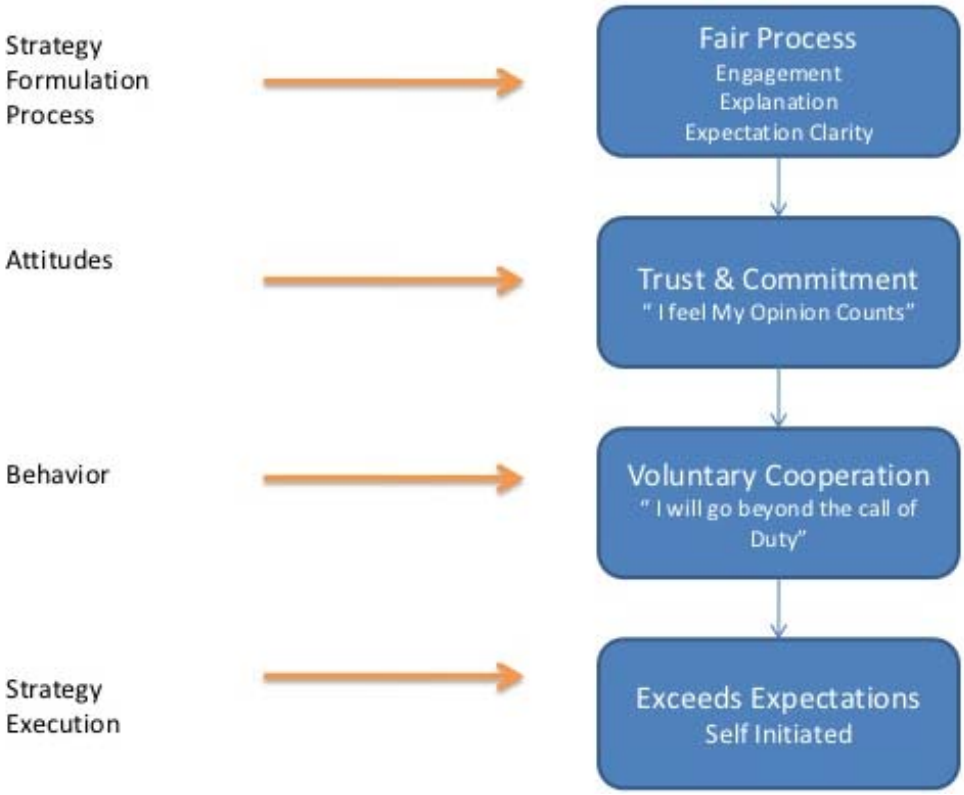

Figure 3: How fair process affect people's attitudes and behavior (Kim & Mauborgne 2005, 174)

3 THEORY OF PRODUCTIZING PROCESS

This chapter of the thesis emphasizes relevant theories of productizing process before combining into existing processes. Theory part consists of exploring the product development, productizing models, business models and management.

3.1 New product development

NPD is as term a very old process and widely studied for different types of industries. In this thesis we do not draw line between product development and productizing, basically idea is to understand problems in existing process and correct or replace them if needed. Vahterus as company is very R&D orientated employing several people full time working on Technology, Quality and R&D Department.

Fahy and Jobber presented a table of four broad categories of new product:

1. Product replacement: these account for about 45 percent of all new product launches, and include revisions and improvements to existing products, repositioning and cost reductions.
2. Additions to existing lines: these account for about 25 percent of new product launches and take the form of new products that add to a company's existing product lines. This produces greater product depth.
3. New production lines: these total around 20 percent of new product launches and represent a move into a new market. This strategy widens company's product mix.
4. New-to-world products: these total around 10 percent of new product launches, and create entirely new markets. For example, the video games console, the MP3 player and the camcorder have created new markets because of the highly valued customer benefits they provide.

(Fahy & Jobber 2012, 161)

3.1.1 Breakthrough Projects

Jurgen Kowals has presented three out four types of NPD project types and risk levels. Normally, a breakthrough project will include significant research and development (R&D) efforts in a new technical arena. R&D for breakthrough projects may take a substantial effort in both human resources and financial investment. (Jurgens-Kowal 2012, 9)

Breakthrough technical developments yield products that change how consumers interact with their environment. In conjunction, a breakthrough market development, also a high-risk endeavor, involves identifying a set of customers that will repeatedly purchase and use the radically new technology. (Jurgens-Kowal 2012, 9)

A special type of breakthrough innovation is the platform project. Platform products have a common architecture or technology basis that is utilized acros a wide variety of products called a product family. Like breakthrough product, a platform product may require months and years of technical research and market development. Furthermore, like a breakthrough product, platform projects may involve higher technology risk and market uncertainty. (Jurgens-Kowal 2012, 12)

3.1.2 Extension Project

Jurgen Kowals uses term extension to the products using a known technology in a new market. Sometimes, these are called “repositioning” projects because the primary work activity for the NPD team is to place the product into a new market. Little traditional R&D activity is conducted in order to launch an extension product. Thus, the technical program is at the lower end of the risk spectrum. (Jurgens-Kowal 2012, 13)

3.1.3 Derivate Project

Derivative innovations are products that utilize new technologies and that are sold into existing markets. These are the most common types of projects in new

product development. Derivates may range in complexity from simple addition of new or improved product features to substantially different technical capabilities offering a new interface for the customer. What is unique to the derivate product compared to breakthroughs and extensions is that the market is already well established. (Jurgens-Kowal 2012, 14).

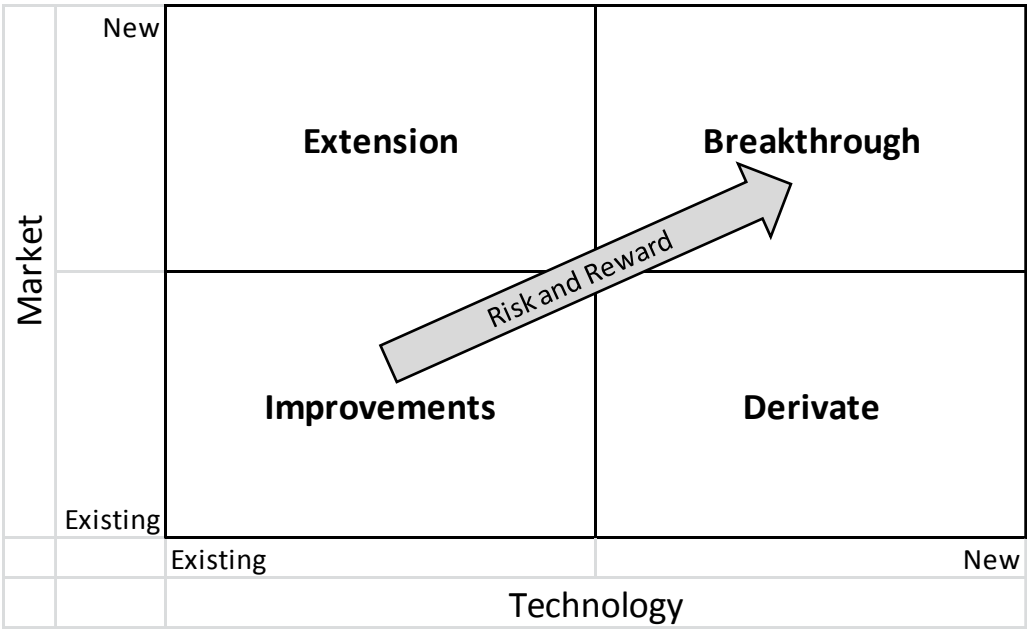

Figure 4: Four common innovation project types (Jurgens-Kowal 2012, 8)

Traditional productization with NPD is often not an adequate fast or flexible way to proceed in the commercial world of today. There is increasing pressure on companies to produce end-to-end solutions to the market with increasing speed. (Hänninen et.al. 2012, 4)

Increasingly sophisticated customer requirements necessitate a wider variety of offering and hence more dedicate new product development (NPD) to battle development complexity and avoid introducing outdated products. Managing development duration, cost and quality demands cooperation between numerous teams which create and utilize product knowledge in multiple distant locations. Such NPD calls for product life cycle management (PLM) to integrate different processes and their agents through a shared body of knowledge. (Hänninen et.al. 2012, 4)

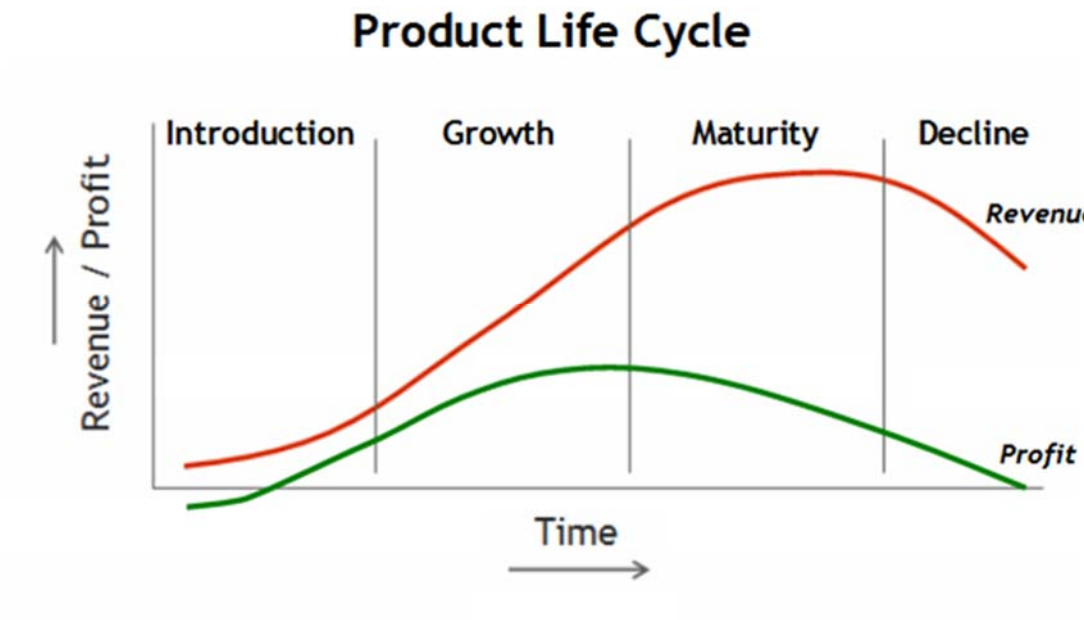

Figure 5: The Product Life Cycle (Fahy & Jobber 2012, 158)

3.2 Productizing

To go a bit deeper into R&D processes the thesis must compare other methods to be complete process from scratchboard to customer. By picking up the best practices from all of the methods we can achieve best practice as Vahterus productizing process. The aim is to find the most efficient solution. In other word, productization is just a task that needs to be done in a course of time before technology becomes success (Simula et.al. 2008, 3).

Productisation is a process, which starts from an idea to fulfil a need or solve a problem of the customer, and ends with a defined, standardized and repeatable product and the product is easy to sell and buy. (Kangas et. al. 2013, 112)

Productization term has also been used in the context of creation of product and services as a one of the key challenges behind firm's success. Productization "refers to the process of analyzing the needs of customers in the target market, the product and developing the ability to produce it". (Simula et.al. 2008, 3)

Productisation as a concept is mainly used in the concept of service development in order to emphasize the needs for clear product definition where productisation means that products, including services, should be standardized, defined, repeatable, configurable, automated, produced and analytically developed (e.g. Saaksvuori and Immonen, 2008; Jaakkola, 2011) When the service is well defined and articulated, the object of exchange is easier to understand. In the case of services, to create service process description, aka a blueprint, is one way to standardize and define services and make them repeatable (e.g. Flieb and Klenaltenkamp, 2004). (Kangas et. al. 2013, 112)

The key idea is to come up with repeatable i.e. standardized output that enables scalability. The situation is slightly easier with physical products as they are tangible by definition. However, the manufacturer still needs to spend time to modify the product into a shape that is easy to understand and use from customers' point of view. (Simula et.al. 2008, 4).

In brief, a firm has to carry out other tasks than the creation of the core product itself – that is to come up with an extended product. An extended product is something a customer is capable to comprehend and it is the most comprehensive form of a product offered by a firm as illustrated in figure and discussed with more details in the following chapters. (Simula et.al. 2008, 4).

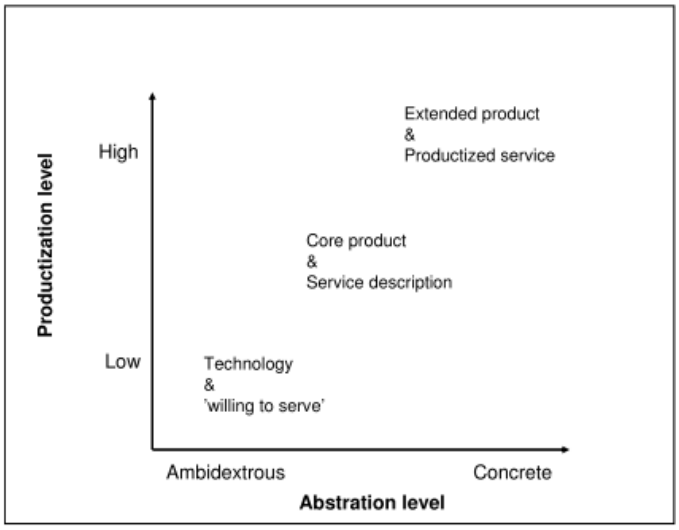

Figure 6: Productization level in context of service and technology illustrated (Simula et.al. 2008, 5)

The goal of productization is to package the offering, technology or service, so that a customer can understand the content of it in advance. Productizing consist of defining, describing, improving, producing and continuously developing the offering so that customer benefits are maximized and the organization's goals are achieved. (Simula et.al. 2008, 5)

Simula et.al. have been studying the concept of productizing and end up to a simple ideology divided into Inbound productization and Outbound productization. Below you can see the figure presenting correlations.

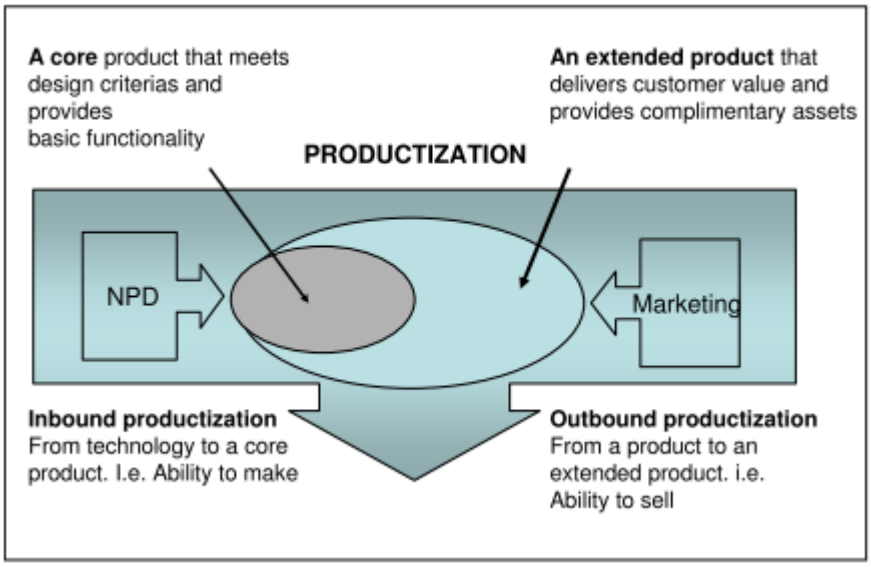

Figure 7: Conceptual illustration of productization (Simula et.al. 2008, 6)

3.2.1 Inbound Productization

Main purpose of inbound productization is to harmonize and systemize the offering delivery process and its outcome inside an organization. For instance, routine engineering work scratch usually creates extra costs. Naturally, various product data management methods and tools have been used to aid with this problem and to help product to reach market faster. Sophisticated utilization of these tools can be seen as an essential part of productization efforts. (Simula et.al. 2008, 6)

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. This development work is the main focus of inbound productization. In practice, an inbound productization means various engineering related tasks such as:

- Final design specifications
- Material selection and sourcing
- Production tools (moulds, jigs,)
- Assembly instructions
- Manufacturing ramp-up
- Product data management
- Testing process and quality control
- Certifications and accreditations

(Simula et.al. 2008, 6-7)

3.2.2 Inbound Productization

The purpose of outbound productization is to improve the visibility and concreteness of the offering for the customers. Outbound productization also works towards increasing the value of a product perceived by customer. There are many things that can add value on top of the core product; such as brand, design, training, after sales service. These are outcomes of external productization efforts – something that a customer naturally considers and values during his or her purchasing decision. (Simula et.al. 2008, 7)

Quite often engineering, or product creation functions in general, do not pay too much attention to the other activities that are needed in order a firm to have a complete, consistent and sellable product – something we call here an extended product. This is simply because these tasks typically fall under marketing functions. However, the best outcome could have been achieved if

these tasks will be performed in cross-functional teams. An extended product is the outcome of outbound productization efforts and 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 commission
- Sales tools and pricelist
- Logistics and packaging

(Simula et.al. 2008, 8)

This chapter binds together a cross-functional teams to work together. Simula et.al. mentioned various marketing related tasks that usually are expected to do as marketing function, it is quite obvious that in many projects just a minor part of the list is carried out when product will be launched.

3.3 Rapid Productization

In many businesses, the final offering (with configurable products) is agreed in sales negotiations with the customer. Usually the product is created with sales configuration tool or is bundled from a predefined set of components. Obviously in many cases, a sales negotiation can lead to a situation where the customer's demands cannot be fulfilled. This usually ends the sales negotiations and the customer leaves without a deal. (Hänninen et.al. 2014, 57)

According to Hänninen et.al. deal can be lost because of too fixed product mix. Vahterus is involved in many different application for example branch of refrigeration, chemical and process industry and energy application. As the product of Vahterus is complicated to define as a standard the sales personnel usually is involving the R&D to be a part of sales process. This basically means

that the product must be designed and manufactured according to customer specifications. Rapid productization means processes which add value in sales situation on the top of an existing product / and service portfolio to reply a customer need (Hänninen et.al. 2012, 4).

A new item has to create fitting for a current product portfolio if a fast replay to the customer requests is needed. Decision making at sales is demanding and challenges arise a) in order to make reliable and reasoned productization solution and b) to be able to manage solution sold its lifecycle. Rapid productization offers an answer to support controlled productization in sales situation. (Hänninen et.al. 2012, 4)

Sales negotiation become challenging in case an offering of a seller and needs of a customer will not meet in a way that is enough to satisfy the customer. In practice this will mean a situation where offered product or service range is typically lacking something the customer expects to have. In this situation, the sale must be resolved whether to continue sales process or not. If a sales process shows, that a business case is not economically viable the sales process does not of course be extended. (Hänninen et.al. 2012, 5)

The first step after decision in order to continue sales process is to gain understanding what is missing from the offering the customer requires. Second step is to find out an optimum way to fulfill customer requirements and create missing part of the offering. Traditional way is to productize new product offering by NDP process. However, this study focuses on rapid way of productization meaning that productization process starts right away a sale negotiation and sales person as well as customer. The use of rapid productization process as early as possible speed up the entire turnaround time of sales process, this because time needed to find out a proposal speed up as well. (Hänninen et.al. 2012, 5)

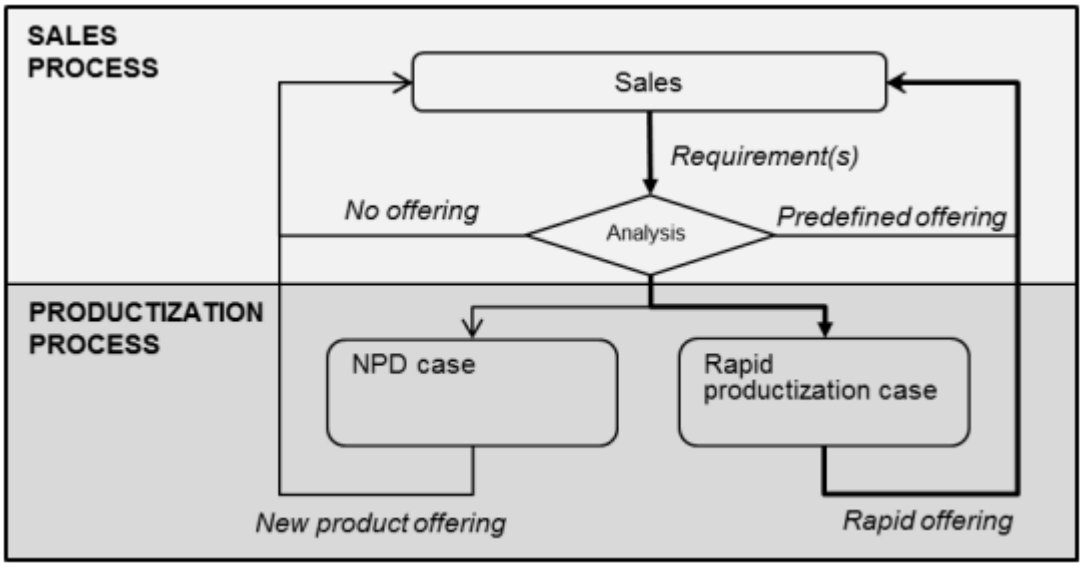

Figure 8: Analysis of a sales response (Hänninen et.al. 2012, 5)

Companies' current customer order penetration point (COP) and order delivery-process set the context for productisation (Hvam et al., 2008). COP divides the company's internal activities into two separate sections; actions performed before customer orders are received, and the ones performed after customer order has been received. Obviously, the variability of the product correlates directly with the COP, where early COP enables more variability and late COP reduces customer's choice. (Hilletofth, 2009; Hvam et al., 2008). This directly affects the completeness of a product specification and on which phase it is actually made. Having late COP (aka make-to-stock (MTS) products) product specification is done in conventional product development when early COP (aka engineering-to-order (ETO) cases) dictates that product is specified according to the customer involvement. (Kangas et. al. 2013, 113)

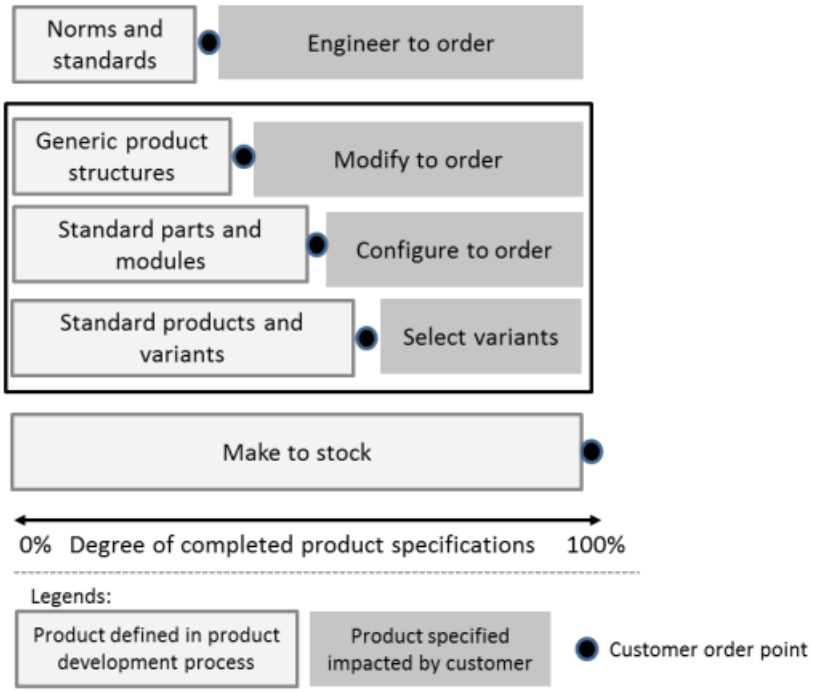

Figure 9: The connection of customer order point (COP) and completion of product specification. (Kangas et. al. 2013, 113)

Rapid productisation does not fit all kind of delivery modes. In case of ETO delivery mode, all delivered products are productised or tailored for customers by definition and rapid productisation is not a needed option. On the contrary, the MTS delivery mode focus on efficient operations with existing stock items excluding any new specifications for orders (Chung et al., 2007). (Kangas et. al. 2013, 113)

According to Kangas et.al. Rapid productization may not be the best practice for ETO products due automatically carried engineering work. In other hand the ideology itself sound very familiar to Vahterus sales process in tailored products. The discussion leads to business model how the productizing process binds the best practice together.

3.4 Business model

The challenge in solution selling is how to productize new sales items so that they fit into the product strategy of the company and are also controllable. (Hänninen et.al. 2012, 4)

In this part we take closer look on business models and how they are binded into productizing process. Vahterus states to be the forerunner of welded plate heat exchangers. To help and maintain the statement the aim of the thesis is to create practical and efficient tool for productizing process. With business model we can ensure that all the inbound and outbound tasks are done but also make the management and resourcing easier.

We need a business model concept that everybody understands: one that facilitates description and discussion. We need to start from the same point and talk about the same thing. The challenge is that the concept must be simple, relevant, and intuitively understandable, while not oversimplifying the complexities of how enterprises function. (Osterwalder & Pigneur 2010, 15)

Osterwalder and Pigneur have overcome with quite simple and innovative way to build up a business model called Business Model Generation Canvas (Figure 1) with nine building blocks:

1. Customer segments: An organization serves one or several Customer Segments.
2. Value proposition: It seeks to solve customer problems and satisfy customer needs with value proposition.
3. Channels: Value propositions are delivered to customers through communication, distribution and sales Channels.
4. Customer relationship: Customer relationship are established and maintained with each Customer Segment.
5. Revenue streams: Revenue streams result from value propositions successfully offered to customers.
6. Key resources: Key resources are the assets required to offer and deliver the previously described elements..
7. Key activities: ..by performing a number of Key activities.
8. Key partnerships: Some activities are outsourced and some resources are acquired outside the enterprise.
9. Cost structure: The business model elements result in the cost structure.

It is quite obvious to notice that the canvas has been divided into left and right sides, as Osterwalder & Pigneur has stated efficiency (left) and value (right) (Osterwalder & Pigneur 2010, 49). This reminds as a structure the Conceptual illustration of productization (Simula et.al. 2008, 6) representing inbound and outbound productization.

Ideas for business model innovation can come from anywhere, and each of the nine business model building blocks can be a starting point. Transformative business model innovations affect multiple building blocks. We can distinguish four epicenters of business model innovation: resource-driven, offer-driven, customer-driven, and finance-driven. (Osterwalder & Pigneur 2010, 138)

In the other hand I would like to compare the Blue Ocean Strategy by Kim & Mauborgne. One of the principles of blue ocean strategy is to reconstruct market boundaries to break from the competition and create blue oceans. This principle addresses the search risk many companies struggle with. The challenge is to successfully identify, out of the haystack of possibilities that exist, commercially compelling blue ocean opportunities. (Kim & Mauborgne 2005, 47)

Reconstructing the market boundaries includes six paths. These paths challenge the six fundamental assumptions, on which most companies hypnotically build their strategies, keep companies trapped competing in red oceans. Specifically, companies tend to do the following:

- Define their industry similarly and focus on being the best within it
- Look at their industries through the lens of generally accepted strategic groups, and strive to stand out in the strategic group they play in
- Focus on the same buyer group, be it the purchaser, the user, or the influencer
- Define the scope of the products and services offered by their industry similar.
- Accept their industry’s functional or emotional orientation

- Focus on the same point in time – and often on current competitive threats – in formulating strategy.

(Kim & Mauborgne 2005, 48)

To break out of the red oceans, companies must break out of the accepted boundaries that define how they compete. Instead of looking within these boundaries, managers need to look systematically across them to create blue oceans. (Kim & Mauborgne 2005, 49)

Blue ocean strategy is a potent method for questioning value propositions and business models and exploring new customer segments. The Business model canvas complements Blue Ocean by providing a visual “big picture” that helps us to understand how changing one part of a business model impacts other components. (Osterwalder & Pigneur 2010, 226)

3.4.1 Alternative Industries

In the broadest sense, a Company competes not only with the other firms in its own industry but also companies in those other industries that produce alternative products or services. Alternatives are broader than substitutes. Products or services that have different forms but offer the same functionality or core utility are often substitutes for each other. On the other hand, alternatives includes products or services that have different functions and forms but the same purpose. (Kim & Mauborgne 2005, 49)

Rarely do sellers think consciously about how their customers make trade-offs across alternative industries. A shift in price, a change in model, even a new ad campaign can elicit a tremendous response from rivals within an industry, but the same actions in an alternative industry usually go unnoticed. Trade journals, trade shows, and customer rating reports reinforce the vertical walls between one industry and another. Often, however, the space between alternative industries provides opportunities for value innovation. (Kim & Mauborgne 2005, 50)

3.4.2 Strategic Groups

Just as blue oceans can often be created by looking across alternative industries, so can they be unlocked by looking across strategic groups. The term refers to a group of companies within an industry that pursue a similar strategy. In most industries, the fundamental strategic differences among industry players are captured by a small number of strategic groups. (Kim & Mauborgne 2005, 55)

Strategic groups can generally be ranked in a rough hierarchical order built on two dimensions: Price and performance. Each jump in price tends to bring a corresponding jump in some dimension of performance. Most companies focus on improving their competitive position within a strategic group. The key to creating a blue ocean across existing strategic groups is to break out of this narrow tunnel vision by understanding which factors determine customers' decisions to trade up or down from one group to other. (Kim & Mauborgne 2005, 56)

Customers comprise the heart of any business model. Without (profitable) customers, no company can survive for long. In order to better satisfy customers, a company may group them into distinct segments with common needs, common behaviors, or other attributes. A business model may define one or several large or small customer segments. An organization must take a conscious decision about which segments to serve and which segments to ignore. Once this is made, a business model can be carefully designed around a strong understanding of specific customer needs. (Osterwalder & Pigneur 2010, 20)

3.4.3 Chain of Buyers

In most industries, competitors converge around a common definition of who the target buyer is. In reality, though, there is a chain of "buyers" who are directly or indirectly involved in the buying decision. The purchasers (1.) who pay for the product or service may differ from the actual users (2.), and in some

cases there are important influencers (3.) as well. Although these three groups may overlap, they often differ. When they do, they frequently hold different definitions of value. A corporate purchasing agent, for example, may be more concerned with costs than the corporate user, who is likely to be far more concerned with ease of use. Similarly, a retailer may value a manufacturer's just-in-time stock replenishment and innovative financing. But consumer purchasers, although strongly influenced by the channel, do not value these things. (Kim & Mauborgne 2005, 61)

Challenging an industry's conventional wisdom about which buyer group to target can lead to the discovery of new Blue Ocean. By looking across buyer groups, companies can gain new insights into how to redesign their value curves to focus on a previously overlooked set of buyers. (Kim & Mauborgne 2005, 61-62)

Communication, distribution, and sales channels comprise a company's interface with customers. Channels are customer touch points that play an important role in the customer experience. Channels serve several functions, including:

- Raising awareness among customers about a company's products and services
- Helping customers evaluate a company's value proposition
- Allowing customers to purchase specific products and services
- Delivering a value proposition to customers
- Providing post-purchase customer support

(Osterwalder & Pigneur 2010, 26)

3.4.4 Complementary Products and Services Offerings

Few products and services are used in a vacuum. In most cases, other products and services affect their value. But in most industries, rivals converge within the bounds of their industry's product and service offerings. Untapped value is often hidden in complementary products and services. The key is to define the total

solution buyers seek when they choose a product or service. A simple way to do so is to think about what happens before, during, and after your product is used. (Kim & Mauborgne 2005, 65)

A company should clarify the type of relationship it wants to establish with each customer segment. Relationships may be driven by the following motivations:

- Customer acquisition
- Customer retention
- Boosting sales (upselling)

The customer relationships called for by a company's business model deeply influence the overall customer experience.

(Osterwalder & Pigneur 2010, 28)

Some value propositions may be innovative and represent a new or disruptive offer. Others may be similar to existing market offers, but with added features and attributes. (Osterwalder & Pigneur 2010, 22)

3.4.5 Functional or Emotional Appeal to Buyers

Competition in an industry tends to converge not only on an accepted notion of the scope of its products and services but also on one of two possible bases of appeal. Some industries compete principally on price and function largely on calculations of utility; their appeal is rational. Other industries compete largely on feelings; their appeal is emotional. (Kim & Mauborgne 2005, 70)

Yet the appeal of most products or services is rarely intrinsically one or the other. Rather it is usually a result of the way companies have competed in the past, which has unconsciously educated consumers on what to expect. Companies' behavior affects buyers' expectations in a reinforcing cycle. Over time, functionally oriented industries become more functionally oriented. No wonder market research rarely reveals new insights into what attracts customers. Industries have trained customers in what to expect. When

surveyed, they echo back; more of the same for less. (Kim & Mauborgne 2005, 70)

When companies are willing to challenge the functional-emotional orientation of their industry, they often find new market space. We have observed two common patterns. Emotionally oriented industries offer many extras that add price without enhancing functionality. Stripping away those extras may create a fundamentally simplier, lower-priced, lower-cost business model that customers would welcome. Conversely, functionally oriented industries can often infuse commodity products with new life by adding a dose of emotion and, in so doing, can stimulate new demand. (Kim & Mauborgne 2005, 70)

If customers comprise the heart of business model, revenue streams are its arteries. A company must ask itself, for what value is each customer segment truly willing to pay? Successfully answering that questions allows the firm to generate one or more revenue streams from each customer segment. Each revenue stream may have different pricing mechanisms, such as fixed list prices, bargaining, auctioning, market dependent, volume dependent, or yield management. (Osterwalder & Pigneur 2010, 30)

3.4.6 Look Across Time

All industries are subject to external trends that affect their businesses over time. Think of the rapid rise of the Internet or the global movement toward protecting the environment. Looking at these trends with the right perspective can show you how to create blue ocean opportunities. (Kim & Mauborgne 2005, 75)

Most companies adapt incrementally and somewhat passively as events unfold. Whether it’s the emergence of new technologies or major regulatory changes, managers tend to focus on projecting the trend itself. That is, they ask in which direction a technology will involve, how it will be adopted, whether it will become scalable. They pace their own actions to keep up with the development of the trends they’re tracking. (Kim & Mauborgne 2005, 75)

But key insights into blue ocean strategy rarely come from projecting the trend itself. Instead they arise from business insights into how the trend will change value to customers and impact the company's business model. By looking across time – from the value a market delivers today to the value it might deliver tomorrow – managers can actively shape their future and lay claim to a new blue ocean. Looking across time is perhaps more difficult that the previous approaches we've discussed, but it can be made subject to the same disciplined approach. We're not talking about predicting the future, something that is inherently impossible. Rather, we're talking about finding insight in trends that are observable today. (Kim & Mauborgne 2005, 75-76)

Three principles are critical to assessing trends across time. To form the basis of a blue ocean strategy, these trends must be decisive to your business, they must be irreversible, and they must have a clear trajectory. Many trends can be observed at any one time – for example, a discontinuity in technology, rise of a new lifestyle, or a change in regulatory or social environments. But usually only one or two will have a decisive impact on any particular business. And it may be possible to see a trend or major event without being able to predict its direction. (Kim & Mauborgne 2005, 76)

By thinking across conventional boundaries of competition, you can see how to make convention-altering, strategic moves that reconstruct established market boundaries and create blue oceans. The process of discovering and creating blue oceans is not about predicting or preempting industry trends. More is it a trial-and-error process of implementing wild new business ideas that happen to come across managers' minds or intuition. Rather, managers are engaged in a structured process of reordering market realities in a fundamentally new way. Through reconstructing existing market elements across industry and market boundaries, they will be able to free themselves from head-to-head competition (Figure 10) in the red ocean. (Kim & Mauborgne 2005, 79-80)

	Head-To-Head Competition	Blue Ocean Creation
Industry	Focuses on rivals within its industry	Looks across alternative industries
Strategic Group	Focuses on competitive position within strategic group	Looks across strategic groups within industries
Buyer Group	Focuses on better serving the buyer group	Redefines the industry buyer group
Scope of Product or Service Offering	Focuses on maximizing the value of product and service offerings within the bounds of its industry	Looks across to complementary and service offerings
Functional-Emotional Orientation	Focuses on improving price performance within the functional - emotional orientation of its industry	Rethinks the functional-emotional orientation of its industry
Time	Focuses on adapting to external trends as they occur	Participates in shaping external trends over time

Figure 10: From Head-to-Head competition to Blue Ocean Creation. (Kim & Mauborgne 2005, 79)

The value proposition is the reason why customers turn to one company over another. It solves a customer problem or satisfies a customer need. Each value proposition consists of a selected bundle of products and/or services that caters to the requirements of a specific customer segment. in this sense, the value proposition is an aggregation, or bundle, of benefits that a company offers customers. (Osterwalder & Pigneur 2010, 22)

3.5 Management

By creating a “perfect” productizing model does not entirely provide successful process. As presented previously the productizing process includes multiple tasks including cross-disciplinary resources to carry out the complete product or service. One aim of the thesis is to present tools for productizing and how to execute complete process with deliverables in reasonable time. This is the point when effective project management takes place all over the process.

Project management is the set of policies, procedures, guidelines, forms, check lists, etc. used to achieve goals, related to a specific problem or opportunity, using resources effectively and efficiently through planning, arranging, sourcing,

orchestrating and controlling. The objectives of project management are to do this on time, within budget and with high quality. (Lotado 2008, 26)

Team members who are empowered to make decisions and act autonomously on behalf of the team generally demonstrate higher levels of job satisfaction and creativity in problem solving. Satisfied employees lead to more efficient product development and, therefore, more satisfied customers. (Jurgens-Kowal 2012, 43)

The task of generating new ideas should not be left to those typically considered to be “creative types”. Ideation is a team exercise. In fact, by its very nature business model innovation requires the participation of people from across the entire organization. Business model innovation is about seeking to create value by exploring new business model building blocks and forging innovative links between blocks. This can involve all nine blocks of the canvas, whether distribution channels, revenue streams, or key resources. Thus it requires input and ideas from people representing multiple areas. (Osterwalder & Pigneur 2010, 143)

Lotado presents projects management by five major activities.

1. Project planning deals with identifying and deciding what should be done and how it should be done. In the above illustration (Figure 12), 1 indicates that project planning specifies the project activities and 2 indicates that project planning specifies the control activities and the control criteria.
2. Project execution consist of 3 activities:
    a. Arranging: Deciding on the proper organization and relationships of resources and processes to most effectively and efficiently achieve the desired results or outcomes – the project objectives
    b. Sourcing: Locating and obtaining all resources needed
    c. Orchestrating: Directing, coordinating, synchronizing, and symphonizing resources in changing and dynamic environments that are often experienced in projects

3. Project controlling: consists of measuring and monitoring actual performance, comparing it to expectations, evaluating differences and providing direction for adjusting implementation activities or changes to the plan.

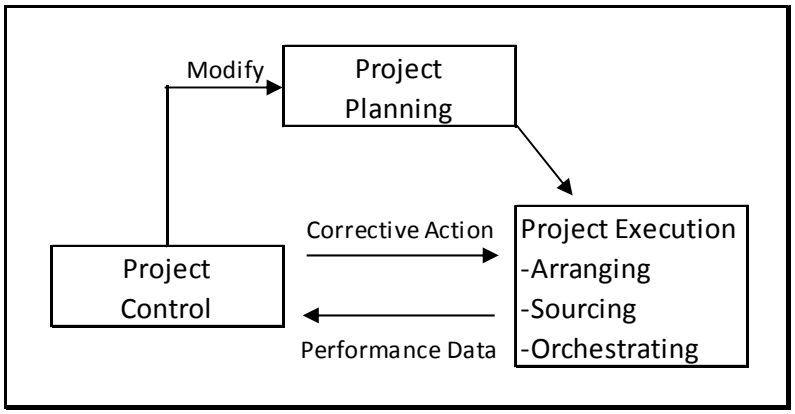

Figure 11: Five major activities of project planning. (Lotado 2008, 26)

3.5.1 Innovation teams

Innovation teams by Jurgens-Kowal are basically consisted by 2 main characteristics, common goals and organizational culture. Common goals and purpose should be understood by each team member and are fundamental to calling a team to action in the first instance. In fact, our definition of “team” requires that the team members rally around a common mission to launch a new product successfully. (Jurgens-Kowal 2012, 39)

For all except the simplies of NPD projects, we recommend documenting the project goals and objectives in charter, often called the Product Innovation Charter (PIC). A key role of the charter is to gain agreement on the innovation project deliverables and to assure senior management that the new product is aligned with the firm’s mission and values. PIC documents should include the following sections:

- Background: why is this opportunity attractive to the firm?
- Arenas: which technologies and markets are addressed by this innovation project?

- Metrics: what measures will be utilized to determine the product team's success?
- Special guidelines: are there any special regulations or considerations for this product development effort?

(Jurgens-Kowal 2012, 39-40)

Organizational culture, on the other hand, is mostly intangible and can vary between firms and even with divisions of a single corporation. Successful organization cultures for innovation allow autonomy of teams and encourage fast failure of ideas in order to generate the most valuable new products in the shortest time possible. (Jurgens-Kowal 2012, 40)

Organizational culture is a set of values, beliefs, and expectations shared by the people in the organization. As indicate above, organizations have a stable existence apart from the individuals that make them up. Organizational culture consist of unwritten rules that dictate the behaviors (arriving to work), communication styles (written or verbal), influences and status, and informal individual and group performance rewards. (Jurgens-Kowal 2012, 41)

3.5.2 Fair process

The Blue ocean strategy has summarized their fair process in three mutually reinforcing elements that define fair process: engagement, explanation, and clarity of expectation. Whether people are senior executives or shop floor employees, they all look to these elements. (Kim & Mauborgne 2005, 175)

Engagement means involving individuals in the strategic decisions that affect them by asking for their input and allowing them to refute the merits of one another's ideas and assumptions. Engagement communicates management's respect for individuals and their ideas. Encouraging refutation sharpens everyone's thinking and builds better collective wisdom. Engagement results in better strategic decisions by management and greater commitment from all involved to execute those decisions. (Kim & Mauborgne 2005, 175)

Explanation means that everyone involved and affected should understand why final strategic decisions are made as they are. An explanation of the thinking that underlies decisions makes people confident that managers have considered their opinions and have made decisions impartially in the overall interests of the company. An explanation allows employees to trust managers' intentions even if their own ideas have been rejected. It also serves as a powerful feedback loop that enhances learning. (Kim & Mauborgne 2005, 175-176)

Expectation clarity requires that after a strategy is set, managers state clearly the new rules of the game. Although the expectations may be demanding, employees should know up front what standards they will be judged by and the penalties for failure. What are the goals of the new strategy? What are the targets and milestones? To achieve fair process, it matters less what new goals, expectations, and responsibilities are and more that they are understood. When people clarify understand what is expected of them, political jockeying and favoritism are minimized, and people can focus on executing the strategy rapidly. (Kim & Mauborgne 2005, 176)

4 RESULTS AND FINDINGS

Every productizing model is company specific, there is no general model for every organization and product. As Vahterus is customer orientated and innovative company the significance of efficient productizing model is an important tool for every day productizing. Model is formed to support existing organization and advance cooperation between departments.

As discussed in theory section there is a number of different concepts for productizing. The main differences were found in the project progress and scope. Traditional NPD is offering consecutive way of progress as project findings are leading to another action. Productization brings the ideology of parallel processes, in principal teams of specialists that can be divided at least into inbound and outbound productization.

Regarding to scope the RP brings new scope for productizing. In an enterprise that is customer orientated and offers advanced products, such as additional services, is basically impossible to create fixed products. For this reason RP introduces Sales driven productizing which in principle means that a single sales person is able to productize an advanced product with specialists from different teams of responsibility and know-how. This also limits the scope as existing product modification, but the added efforts and services are considered as value creation for a customer. Another limit is time.

Most interesting finding is that productizing in Vahterus is an everyday task. As customers are demanding and important to satisfy Vahterus employs tens of engineers working with customer projects and specifications. Productizing can be divided into two different extents of processes, rapid productizing and NPD. Rapid productizing is a small scope project carried by sales department working together with other department regarding product modifications regarding to customer needs. At this scope, time is the limiting metric.

Another finding is that NPD cannot be executed by only sales personnel. This for example involve R&D department in wide extent of product testing and technology development. According to extent a sales person should not be in

responsibility of project execution as the main responsibility is in sales operations. For the most effective way of executing NPD is to involve separate departments with accurate know-how and responsibility. This means also that sales or marketing personnel should be involved in outbound productizing as the know-how is related to customers.

Also management of expanded productizing process comes highlighted. To execute productizing effectively needs tight control over the project. Value proposition, considered as goal, and responsibilities must be distributed to operate the most accurate and effective resources.

NPD productizing model is formed as following (Appendix 1) to execute productizing of wide extent. This is modified and based on Osterwalder & Pigneur (2010) Business model canvas to support Vahterus organization. Basically the Vahterus model is dividing responsibilities by task stages. Also in limited extent some stages can be left empty if these actions are not needed. However the project manager should remember that resources should be accurate as possible.

Productizing model works as a tool for project management. Meetings are held to list all the needed activities on the model sheet and to evaluate previous results. Every meeting indicates responsibility of every single stage and addresses the action which is needed to be carried out by next meeting. After evaluation of results a next action sheet should be filled out. The model designates responsibility and indicates individual goals.

RP cover short extent productizing carried out by sales department, information and responsibility are the key factors. Internal information should be documented and declared be to repeat or adapt. The most efficient way of profitable business is not to replay engineering work or run overlapping processes. That is basically waste of resources. In the other hand lack of information causes uncertainty. All the executed research, development or engineering work must documented to be able to use in parallel processes.

Responsibility shall be pointed out to a specialist. At least senior position such as Application manager or Senior designer shall be indicated as specialist. However lower level positions can be addressed as specialists as they might be involved by every day work in specific scope of product or application. For this reason the suggestion for developed RP process is to create a specialist map. Every department should point out specialists for product or application specific profession.

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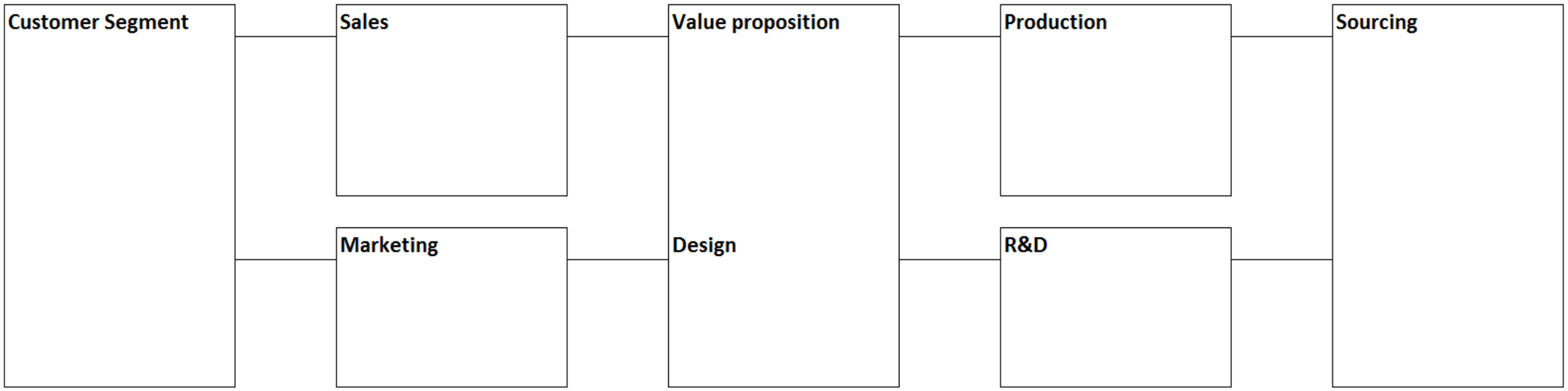
VAHTERUS

Productizing model

Date:

Project:

Project Manager:



Instructions

Determine targeted Customer segment or Sales group.

Consider needed Sales activities such as Offer material, Value offering, Purchase process, Aftersales

Reflect needed Marketing activities such as Marketing material, Value offering, Contracts, Exhibitions

Determine specific Value proposition as following; Customization, Performance, Price

Prepare specific Design activities such as Drawing, Material list, Rules & Regulations

Reflect needed production activities such as HR, Facilities, Activities

Think about R&D activities such as Problem solving, Laboratory, Engineering software

Reason demanded sourcing activities such as Material, Components, Semi-products, Services