The consequences for new product development by looking at the Present & Future Customer Value

Based on a case study conducted at Trimergo International BV

Bachelor Thesis

Industrial Engineering and Management

by N.J.P. ten Hove

Supervisors:

University of Twente 1st: R.P.A. Loohuis MBA

University of Twente 2nd: Drs. P. Bliek

Trimergo International BV: Drs. Ing. J.D. Koning

Foreword

During my career at Trimergo International BV (from now Trimergo), I discussed the possibility for me to do a research in order to pass my bachelor. I am very thankful that Jelle Koning offered to help me. He was willing to become my supervisor at Trimergo. From the University of Twente I got Raymond Loohuis appointed to be my supervisor, he was very enthusiastic and came with lots of ideas for Trimergo to excel in current times, the financial crisis. During the research sometimes big changes in the problem statement were made in order for me to start all over again from another angle. But this helped me to understand researching much better.

During this research I learned to be strict with myself, not to plan but to do. In future research I will not start with making a planning and layout of the research paper but by doing actually what is essential. Certainly a structure is important in order to not get confused but this is done by working in steps that are essential to perform a research. Before this research I was not very good in structuring my documents, this is now transformed in a way that I can structure a document as it is necessary for research. For me the theoretical framework was a challenge, in future researches I want to learn even more about integrating theories in order to get a good framework.

Personally I want to thank my supervisors Jelle Koning and Raymond Loohuis for suporting me during this research. Also my thanks go to Patrick Bliek for helping on such short notice. Besides supervisors I also would like to thank my woman, family and my best friends. From which Stefan Kuiper devoded also a lot of time and effort in order for me to find a good way for researching, many thanks for this.

Management Samenvatting (Dutch)

Dit onderzoek is gestart vanuit de vraag naar de toekomstverwachting van ERP. Het doel was om hier trends in te onderzoeken voor Trimergo. Al snel werd duidelijk dat het onderzoek zich ging richten op wat de klanten van Trimergo op de lange termijn verwachten van de ontwikkeling van de software. Dit heeft ertoe geleid dat de focus is komen te liggen op de software ontwikkeling van Trimergo.

Binnen dit onderzoek ben ik gaan kijken naar de verschillen tussen hoe momenteel de huidige klantwaarde wordt gecreëerd en wat hierbij de aanpak is voor productontwikkeling. Middels interviews heb ik onderzocht waar in de toekomst de klantwaarde voor de klant zou kunnen worden geleverd en hoe het product ontwikkelingsproces hier het beste bij aan zou kunnen sluiten.

Vanuit de theorie zie ik dat er grote voordelen vallen te behalen bij het integreren van klanten in het productieproces waarbij dit momenteel nog niet optimaal is. Klanten zouden beter meegenomen kunnen worden in het ontwikkelen van nieuwe toepassingen of modules om zo optimaal mogelijk de klant te kunnen bedienen. Met als uiteindelijke doel het behalen van maximale klantwaarde.

Binnen dit onderzoek is naar voren gekomen dat de klant tot op zekere hoogte al geïntegreerd is in het huidige ontwikkelingsproces van Trimergo. Binnen mijn aanbevelingen geeft ik aan dat de maximale klantwaarde bereikt kan worden door de klant optimaal te integreren in het ontwikkelingsproces.

Table of Contents

List of Figures

List of Tables

1. Introduction

In order to finish my bachelor of science in *Industrial Engineering and Management* it is necessary to write a thesis. In this case I, the author, had chosen to perform a research in the area of strategic management for writing a bachelor thesis. For this research I got an opportunity at Trimergo. Three and half year I was an employee of Trimergo while also studying on my bachelor. Together with Jelle Koning, product strategist and co-owner of Trimergo, I discussed to research future trends in the market of Enterprise Resource Planners (ERP). ERP is in general an application that supports the main process of a company.

After the discussion with Jelle Koning, a supervisor at the university was found. Raymond Loohuis would be my supervisor, in his current position he is researcher, lecturer and supervisor at University of Twente (NIKOS). We discussed the problem that Trimergo is facing. They do not know what the future (functional/structural) demand will be of the current customers and the effects of this on product development. This problem is shared with a lot companies, therefor I set my goal to generalize the question. Trimergo would become a case study as the base for this research.

In first instance the playing field of service providers and value creation was the main objective. In a later stadium the part of service providers was changed to product development companies, because in the case of Trimergo the service is limited. Customers of Trimergo buy the software and become owner, where service providers don't sell the software as a property but provide the customers with the possibility to use the software without buying the ownership.

In chapter one I start to describe more about Trimergo and give a background, and then followed by a thorough explanation of the problem they are facing. The basis from my research is than found in creating a research question.

In the second chapter I continue with my theoretical framework, followed by (research) methodology where I explain why to use certain technics to gather empirical data. After all data is collected in the fourth chapter an exhaustive analysis of this data will be done in order to generate an understanding of the effects on new product development from customer value. From here I lead to a conclusion with recommendations.

1.1 Background Trimergo

Trimergo is a SME (Small and Medium Enterprise) in developing software for the project based manufacturing industry. Since 2001 Trimergo is founded in Apeldoorn by three participants (Jelle Koning, Wim Schrijver and Frank Brouwer).

The initial thought of these three pioneers was to set up a planning system that would integrate with the process of companies with a focus on project based manufacturing. Besides being a planning system other aspects of ERP (Enterprise Resource Planner) software were also taken in the design. This first software was introduced to the market under the name Trimergo T1.

After a period of having only the focus on Trimergo T1 as the only software package, the board decided to adopt their philosophy in an add-on for a market leading ERP package from SAP specially made for small companies. Because of the proven track record of SAP it seems that they could earn a lot of money only by selling licenses to business partners who integrate this SAP Business One ERP package with their Trimergo B2 (the add-on tool) to simulate the same philosophy of project driven manufacturing for a worldwide used software package. Therefor two new partners were attracted (Bert Grolleman and Kees Huijbers).

Since 2008, the Trimergo board decided to upgrade their Trimergo T1 product from a fully web-based product (accessible using the internet browser) to a fully Server-Client based product. Big advantages from this system are the scalability. Due to an increasing demand of capabilities and increasing amount of users the web-based product took a lot of time calculating all kinds of difficult calculations at the server-side where the user needed to wait long. Therefor the new Trimergo T2, introduced in 2009, was a big improvement and success by distributing the computation power to the clients.

Because of new plans of Trimergo in the beginning of 2011, to put a focus on their own software product, Trimergo B2 was sold to another party. Whereby also two partners left Trimergo (Bert Grolleman and Kees Huijbers) and a new partner (Maarten Weggemans) was attracted because of a buyout of an investment company which helped Trimergo in the first years to help with mainly financial capital.

1.2 Structure of Research

In the article of Baxter and Jack (2008) case study design is discussed and explained for novice researchers. According to this article there are two key approaches that guide case study methodology; one proposed by Robert E. Stake (2005) and the second by Yin (2002). In this case Yin (2002) a case study design should be considered when: (a) the focus of the study is to answer “how” and “why” questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between phenomenon and context. In the case of this research I belief that you can speak about a case

study design because 'the boundaries are not clear between phenomenon and context.' In the next section, where we elaborate on the problem by giving a good explanation, this will be confirmed.

The following chart will give you a better systematical understanding of the whole research step by step:

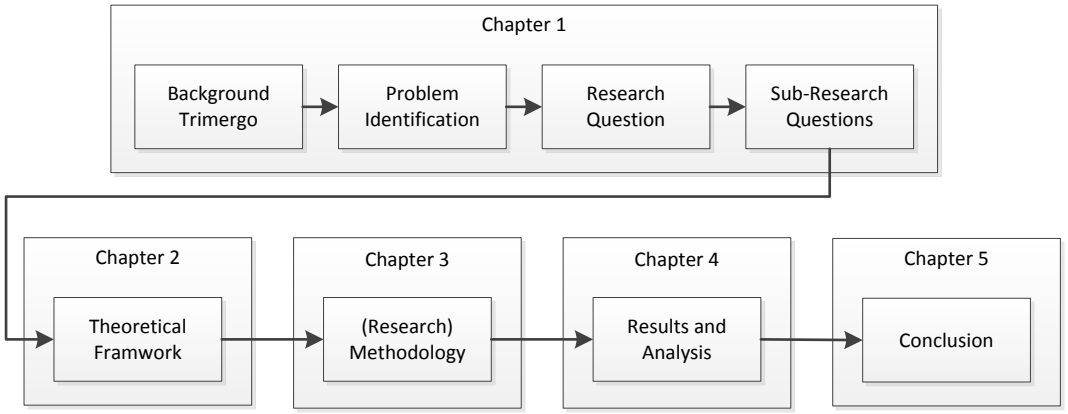

Figure 1 - Research Design represented in a flowchart

1.3 Problem Identification

In this section I elaborate on the problem that is the basis of this research. The initial idea behind this research comes from Trimergo. Trimergo is a company that operates in a niche market and only offers her product to businesses (B2B). They want to know whether there is a gap between present customer value and future customer value in order to adopt a new product development strategy. The aim of this research is to reach a general theory that is formed by using Trimergo as a case study; I will now formulize the problem according to a more general problem.

According to Anderson and Narus (2004) the playfield of customer value can be divided into different stages. Starting with understanding the value for customer till delivering the customer value, this is represented in *Figure 2 - Business Market Process (Anderson & Narus, 2004)*.

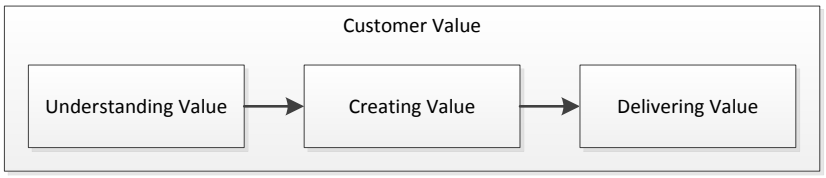

Figure 2 - Business Market Process (Anderson & Narus, 2004)

When I observe the business market process of Anderson and Narus (2004), I start looking at the first stage of understanding value. In general this is the point where you need to be very keen on what the customer desires. The reason that you need to be keen in the first stage is because it effects all other steps in order to forfill customer value.

In order to create total customer value, there should be some kind of product that is developed per customer specifictly (tailermade). In the creating value stage the focus is on the development of a new and better product, in this case I speak about the new product development strategy.

Now the questions arrise, when we compare the present and future customer value, we want to know if the current new product developments are also suitable for the future value creation for the customer. I was looking for researches in the area of customer value (understanding value) and new product development (creating value). It seems that on the playfield of customer value and NPD there is no previous research available. But looking at the researches of Hamel and Prahalad (1994) or Woodruff (1997) they give a good basis of the relationship between present and future customer value.

1.4 Research Questions

Looking to the problem formulation I can generate the following research question that is later derived in sub-research questions in order help answer the research question.

1.4.1 Research Question

"What are the differences between present & future customer value and what are the consequences for new product development?"

1.4.2 Sub-Research Questions

In order to make it easier to create a good and systematic conclusion on the given research question I created sub-research questions. With these sub-research questions the general research question can be partially analyzed and answered.

1. *How is customer value defined?*
2. *What are NPD processes?*
3. *What is the relationship between customer value and NPD?*

2 Theoretical Framework

The goal is to research and learn about the concept value creation and this on the spanning with product development. In general I would assume that value creation is the reason why a company has customers. These customers see the product or service that they acquire as an addition of value. First I am going to look into theoretical concepts and previous researches that are related to this topic of value creation. Secondly I will deepen into the definition of new product development and the different perspectives that can be seen on the playing field of value creation and product development. This followed by a chapter in which I describe the relationship between value creation and new product development.

2.1 Value Creation

According to Anderson and Narus (2004) there are three stages in which value can be created for the customer. These three stages are also described shortly within the problem formulation. Now I use these three stages in order to create a foundation on which I later can make analysis. Within the problem formulation a scheme is given of three stages, *Figure 2 - Business Market Process (Anderson & Narus, 2004),* that are put in chronological order in the following parts. Within these stages more literature is found to give a more clear view of value creation.

2.1.1 Understanding Value

From Day (1990) I learned the following about understanding value. Day (1990) wrote a part about customer-oriented assessments in which he looks at the different steps that are needed to understand the value that is created at the customer side. First he suggests identifying the customer. Secondly you should look at the value that can be created by you at this customer. Thirdly you should know how the customer would base his decisions for choosing your product, in this case software instead of the product of your competitor. The positioning of your product should be equal to the requirements of the customer for choosing a product. In the next chapter the term value mapping is introduced in order to explain this better.

According to Woodruff (1997) customer value is the main idea behind competitive advantage. The author created a customer value hierarchy model that explains three different ways for customer satisfaction.

Figure 3 - Model Desired Customer Value Woodruf (Woodruff, 1997)

In the first step of desired customer value the *customers' goals and purposes* aimed on goal-based satisfaction, the second step the *desired consequences in use situations* gives consequence-based satisfaction, and at the last step we have *desired product attributes and attribute performance* that gives the attribute-based satisfaction. From these three you have to take a desired customer value by the customer and map this with the type of satisfaction for the customer.

When coming across the article of Saarijärvi (2012) and read about the aspect of value co-creation, this is really where you have the opportunity to understand the customer in my opinion. When working together, between your company and the customer, the possibility of getting the highest level of understanding can be achieved. As Saarijärvi (2012) denotes in his article that an interaction mechanism that integrates the innovation process between your company and the customer will improve the further understanding of the area of value creation with your customer.

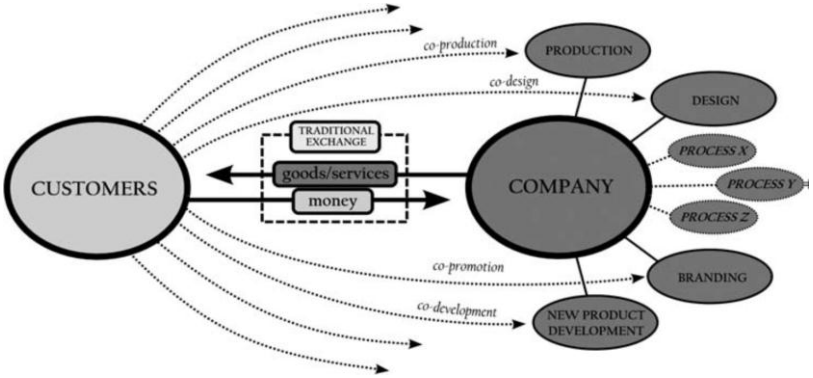

Figure 4 - Identifying different ways to engage the customer (Saarijärvi, 2012)

2.1.2 Creating Value

Were Anderson and Narus (2004) refer to creating value, in their business market process shown in *Figure 2 - Business Market Process (Anderson & Narus, 2004)*, the production and or innovation process that will be helping the customer. Creating value is in this case based on the value that is to be created as the customer would need it. The creation of value is done by new product development; more on this topic will be spoken in chapter 2.2.

The positioning of the product, in this case for a niche market, is also an aspect of creating value. Looking to the aspect of creating value, Day (1990) also mentions the fact that you can scale your level of creating value in different orders. Looking at the *Figure 5 - Value Mapping (Day, 1990)* I can make the value creation process more specific on a certain level of customization. The focus is on the combination of the relative costs for the customer and the relative benefits that this customer will perceive. As Day (1990) suggested on page 132: 'Most businesses position their offerings on the diagonal from the economy to the premium end and thus price their products to capture the customer value they have created. However, some of the competitors will be off the diagonal, by accident or design. Those charging average prices for lower

benefits are offering inferior value-not a secure position for the long run'. This is in my opinion relevant for understanding for what business type you are planning to create value.

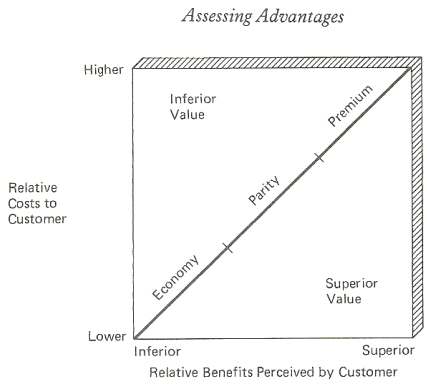

Figure 5 - Value Mapping (Day, 1990)

For a company the following ways are available to differentiate products and or service that create meaningful benefits for customers as Day (1990) describes:

- Providing superior quality that cuts customers costs or improves their performance
- Providing a superior service or technical assistance capability through speed, responsiveness to difficult orders, or ability to solve customer problems
- Utilizing a strong brand name that connotes the appropriate image of style or luxury and prestige
- Offering a full line of products in a market where one-stop shopping is important, or modularity of systems components is desirable
- Attaining wide distribution coverage
- Being first to offer innovative features employing new technology.

When a company is not planning to differentiate an alternative option is to go for cost leadership. In this situation the company needs to lower cost positions, this is often achieved by firms that offer standard or economy products. This might result, in my opinion, in a more inferior product then when you choose for the differentiation of a product as described above. This is applicable in the case that a firm needs to decide how the creation process should be modeled in order to create value for the targeted customers.

2.1.3 Delivering Value

When I speak about the part of delivering value, you mainly think about service and integration from the created product. According to Ulaga and Eggert (2005) the focus within delivering value is gaining and sustaining the key supplier status. This means that you as a producer need to integrate the product, in this case software, with the customer. As you see in the *Table 1 - Value Drivers in Key Supplier Relationship (Ulaga & Eggert, 2005)* there are three types of integration. Where core offering means that you as a producer deliver the product based on direct costs to your customer, making all specific work at the expense of the customer. In sourcing process you only are able to sell the parts, in the case of software

development this would be software modules, which the customer is willing to pay for. At last Ulaga and Eggert (2005) mention customer operations in which the customer only pays the bill for operation costs. You can compare this last version with a pre-paid phone for which you only pay when you make a call.

	Relationship Value Dimensions	
Sources of Value Creation	**Benefits**	**Costs**
Core offering	Product quality Delivery performance	Direct costs
Sourcing process	Service support Personal interaction	Acquisition costs
Customer operations	Supplier know-how Time to market	Operation costs

Table 1 - Value Drivers in Key Supplier Relationship (Ulaga & Eggert, 2005)

In this phase I also want to eleborate on the aspect value creation, specifictly from software development companies, for the customer. Customers that buy ERP software have the need to improve their primairy process. They see the software as an addition of value on their whole production process because they can manange the process better and more efficient. In this case the costs are not directly for the customer. The ERP software from Trimergo not customized for a specific customer but designed for a niche market. In this case Trimergo focuses on the niche market of project driven industries like shipyards, offshore, and construction. The service that is offered with the software is part of the value creation. In my opinion this is the same as sourcing process as described by Ulaga and Eggert (2005). Where the costs are only made based on acquisition.

According to Grönroos (2011), the delivering of customer value to the customer is the process of interactions between the customer and the supplier process. See the following figure for a better understanding of the interactions:

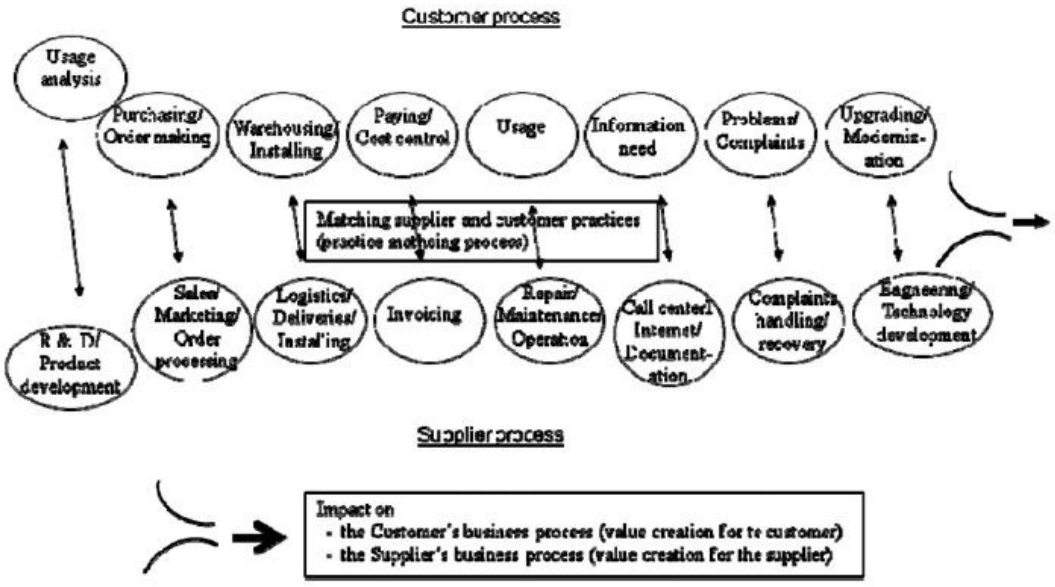

Figure 6 - Customer and supplier processes and their impact on the business processes (Grönroos, 2011)

2.2 New Product Development

New Product Development is also abbreviated as NPD in the literature. According Trott (2005), in which NPD is described in very clear ways, NPD is a way of strategic choices that explains the total process of development till the commercial exploitation of the product. This can be seen is different stages followed by the following processes:

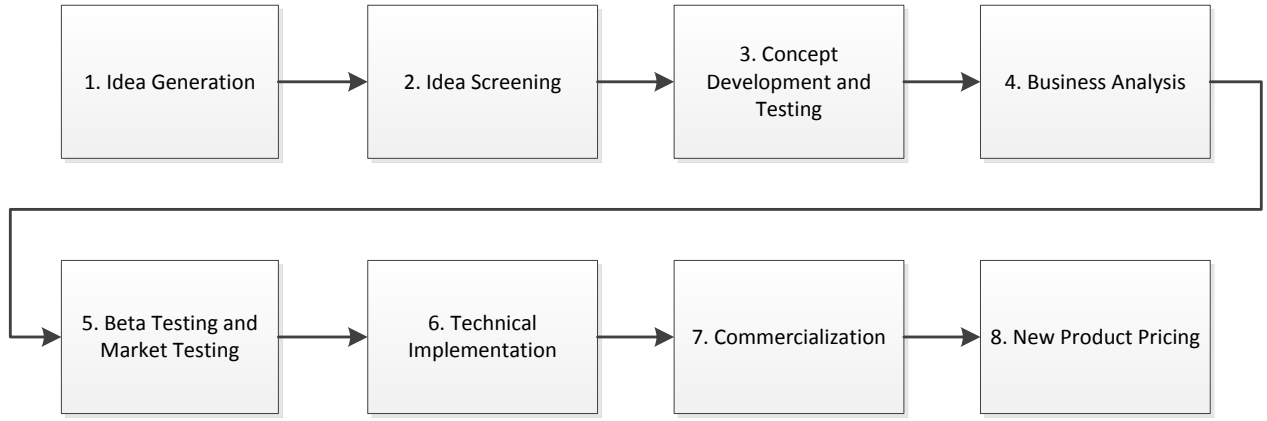

Figure 7 - New Product Develeopment Process (Trott, 2005)

1. *During this stage different ideas are generated and analyses are made like the SWOT analyses that make an analysis of the strengths, weaknesses, opportunities, and threats.*
2. *In this stage the object is to eliminate unsound concepts prior to devoting resources to them.*
3. *Develop the marketing and engineer details about the too develop concept.*
4. *Make an estimate how the market and customers would react on this concept.*
5. *Set out concept products in the market; think about a beta version of the software for testing.*
6. *Now a complete prepared plan should be ready, call it a what-if planning.*
7. *Launch the product.*
8. *Value analysis and check the impact of new product on the entire product portfolio.*

Nambisan (2003) argues that the production process of information systems are a valid reference for NPD. Within his research a couple of aspects are discussed in comparison with other industries for development. But in the main Nambisan (2003) create different dimensions for product development in information technology (IT); process management, project management, information & knowledge management, and collaboration & communication. For this research it is relevant to understand that the process of developing software is substitutable for the NPD process.

As earlier mentioned in 2.1 Value Creation, the process of value creation can also be seen as a process of co-creation. According to Vargo and Lusch (2004) co-creation is the new way of marketing. They state that Knowledge is the fundamental source of competitive advantage. Where in this case I belief an interaction

between customers and producer can result in the ideal way to share knowledge for the best end result. Vargo and Lusch (2004) also state that the customer is always a co-producer; meaning that customers are also helping to create the end product. In their conclusion I must agree with the statement, which tells about the way that value creation can still be achieved, the focus is shifting from tangible and goes towards intangible, such as skills, information, and knowledge, and towards interactivity and connectivity and ongoing relationships. In this case the usage of IT is insurmountable and necessary to support these aspects.

If we now put on our product development glasses and put away the glasses of value creation, you see that co-creation can also be the way that customers interact with the supplier in order to create new ideas or to improve current parts of the system. This touches the work of Saarijärvi (2012) were the focus is on the different ways that a customer can engage in the innovation process for creating value.

According to Saren (1984), the following model helps classify the intra-firm innovation process. These different models represent the process of innovation of new products, so in a sense this is NPD. From which is network model the last know model that interacts between all different actors in a network in order to develop a new product. The following models are placed in chronological order starting from the 1960s till the late 2000s:

1. **Departmental-stage models**
   When a part per department is finished within the total process it moves up one stage to the end.
2. **Activity-stage models and concurrent engineering**
   When a part per activity is finished within the total process it moves up one stage to the end.
3. **Cross-functional models (teams)**
   Teams from different disciplines work on the same development project
4. **Decision-stage models**
   This can be seen as a stage gate model, in which per step a decision needs to be made, for example, to continue or stop the development process.
5. **Conversion-process models**
   NPD is in this case a process where an input is put in and an output comes out with some sort of conversion behind it.
6. **Response models**
   This model looks to the market in order to understand what the input of the NPD will be.
7. **Network models**
   In the network model all previously described points will be taken, it's the most complex model with the most versatile connections.

For this research I am planning to use these models how the process behind NPD is changed over time. I currently think that the ERP software producers are acting on the level of response model. But for a good interaction between customer and producer I argue that it would be better to use the network model. This also will underline the ideas that Vargo and Lusch (2004) are suggesting. As well as the way that Saarijärvi (2012), that is explained in chapter 2.1.1, looks at the interaction between customer and producer.

2.3 Relationship between Customer Value and New Product Development

Flint (2002) did research about the relationship of customer value and process of new product development. In his article he speaks about the cycle life of the NPD process and how it can be reduces while improving the quality. Flint (2002) created a model that shows the important aspects of understanding customer value. From this model I am particularity interested in the customer value determination process, product analysis, technological breakthroughs, and tactic knowledge tapping process. Determination process tells something about what the customer needs and wants, technological breakthroughs look at the new technologies that are available in order to create value for the customer by the supplier, and tactic knowledge tapping is the ability to use knowledge from the system in order to make tactic decisions for the customer. Later in my research I am going to use this in order to give a good background on the way that these steps would influence NPD. The plan is also to look for differences in the customer value creation now and in the future, this will probably be difficult because no substantial research is available to use as underlying.

Besides the research of Flint (2002), the research of Kahn, Barczak, and Moss (2006) introduces four levels of NPD interaction based on the process that is the basic of creating customer value. These can be used in order to place the NPD process that is used at the supplier in order to create customer value. Look for the different levels in the table below:

LEVEL 1	*LEVEL 2*	*LEVEL 3*	*LEVEL 4*
No NPD process exists There is a flurry of NPD activity without any discipline surrounding the management of NPD development activities Criteria for evaluating NPD projects are not defined There is no NPD process owner or NPD process champion	Informal, decentralized NPD process exists where different groups use their own tailored process Limited documentation on the NPD process The process can be readily circumvented by anyone A few standard criteria are used for evaluation of NPD project activity Idea generation is structured and formal Different processes exist for ideas coming from internal and external sources Minimal testing performed Product champions are critical to NPD success	A common NPD process cuts across organizational groups Documentation on the NPD process is available Idea database is maintained Time critical projects may skip stages of process Product champions play an important role, but are not mandatory One individual or group can be readily identified as the process manager There is an apparent NPD discipline	One formal stage-gate type process is employed for the entire organization The NPD process is quite visible and well-documented Personnel are very disciplined in using the process to develop all new offerings Go/No-Go criteria are clear and pre-defined for each review gate The NPD process is flexible and adaptable to meet the needs, size, and risk of individual projects There is an intranet for NPD process documentation

Table 2 - Levels in which the NPD process can be placed (Kahn et al., 2006)

2.4 Theoretical Framework – an Overview

In this research the following model, *Systematical view of the Theoretical Framework for this research*, is set-up in order to give a visual presentation of the linkage. From the research questions it is clear that we look at the present and at the future customer value creation. According to Anderson and Narus (2004) the focus should be on the understanding of the customer in order to know where to create value later in the process. With empirical research and the basis of the founded theories I am trying to determine a gap between the present and future customer value creation. If there would be a difference this could have implications for the value creation and new product development. In chapter 4 an extensive analysis is done to determine if there is a difference between present and future that can have implications for New Product Development.

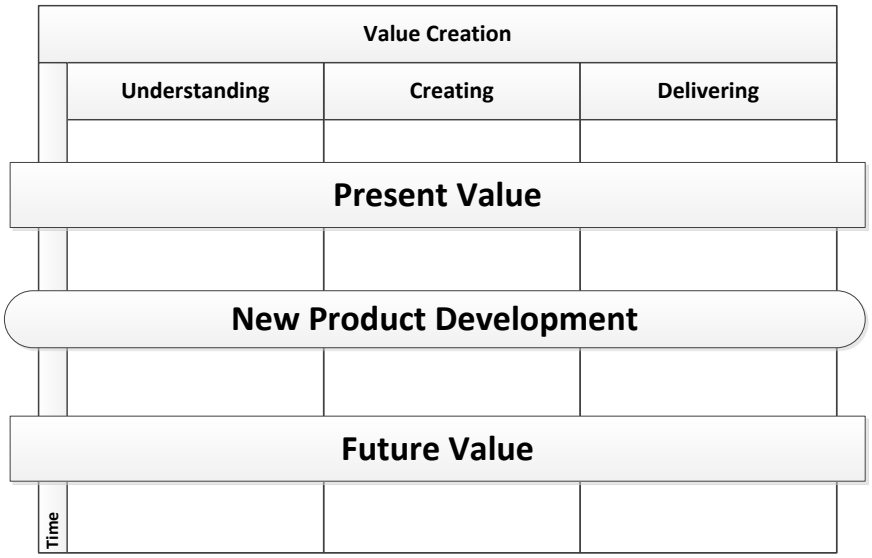

Figure 8 - Systematical view of the Theoretical Framework for this research

3 (Research) Methodology

Now I did an introduction in the theories that I am going to use from chapter 2. With this in mind I will now focus on the methods that I would like to use in order to gather for analyzing later. Different aspect play a role in this, firstly an extensive literature research was conducted. Now a series of interviews will take place with the planning/production managers of customers or board members and senior consultants of Trimergo for a later analysis on the maybe different view on the whole.

3.1 Operationalization of Constructs

In this step I want to make the conceptual idea more concrete to the case. Within this research Trimergo is taken as a case in order to gather empirical data. This is done by interviewing the customers of Trimergo. The main idea is to get information in order to answer my research questions. Therefor the units of analysis are the customers of Trimergo. Questions will be about the current and future expectation of the value creation of Trimergo. To have a better insight in all the questions that are asked you can have a look at the interview scheme in the appendix. The questions are arranged in different categories to get all necessary information from the customer. These categories are taken from the work of Grönroos (2011), he did research on the spanning field of customer process and supplier process. What areas are creating value and how do they react between the two sides. Since I firstly look at the customer side, I will take the customer process as described by Grönroos (2011).The following keywords will be used for coding in order to get the necessary information from the customers to understand the customer value. This will be done for as well understanding present customer value as future customer value. Besides Grönroos (2011) I found overlap with Flint (2002) for customer value understanding. I put them cursive behind the keywords of Grönroos (2011) between brackets.

1. Usage analysis *(Determination process)*

   This is the step where the customers look what they need in their organization in order to maximize the profit in which the ERP software creates value. This often involves the process of checking functionality and all kinds of specific needs that must be for filled by this product.
2. Purchasing / Order making

   Within this stage the ability of the ERP software is checked on the area of orders. It should be equipped enough to support the purchasing and order making processes of the customer.
3. Warehouse / Installing

   Keeping track on specific parts or other goods is essential; here the value creation of this part is determined.
4. Paying / Cost control

   In order to have a successful business there should be support on the financial flows, as well in and out. Here the value creation of the software is determined for the support of financial flows.

5. Usage *(Product analysis)*

   Besides the fact that the software is having a lot of specific functions, there is also an aspect of geometrics and usability. This is analyzed here in order to know whether the software creates value or maybe takes too much effort.

6. Information need *(Tactic knowledge tapping process)*

   Within ERP software a lot of data is put by the customer. The aim is to also use this data wisely and therefore should represent information that is relevant to the customer. Take for example the information on what customer doesn't pay on time, and what is the unused capacity in the production process.

7. Problem / Complaints

   Since software is built by humans there are the possibilities that certain functions in the software don't work. Assuming that you as a supplier you do your best to reduce the amount of failures in the software; this is often not a hundred percent guarantee that there could be a mistake. Here the support and of problem solving from the supplier is addressed by the customer.

8. Upgrade / Modernization *(Technology breakthrough)*

   How does the software supplier adopt with new changes or trends, and what is the experience of the customer when upgrading to a new version. The value for the customer in this is analyzed.

Besides the customer value also answers must be found in the area of NPD. Firstly the current process must be understood; where after future implications or changes should also be found for NPD. Grönroos (2011) looks also at the supplier side and from this the following is relevant to look at during the coding process.

1. R&D / Product development

   From the point of view of the customer is looked at the integration of customer in the complete product development process. This is in synchronization with the usage analysis that is mentioned above.

In chapter 3.3 more is written on the method that is used for the interviews and the way that coding will be done using the above given descriptions to determine customer value.

3.2 Research Method – A Case Study

According to R.E. Stake (1995) there are different forms of case-studies: "the deep" form (intrinsic) at which comprehensively and thorough one case is considered; "tool" (instrumental) where purpose – to understand a concrete question at issue; and "collective" (collective) at which the concrete situation is considered at once on an example of several cases. In this case the research will be on the basis of "the deep" case-study.

According to Eisenhardt (1989), theory that is formed by the way of case-studies has some important strength of novelty, testability, and empirical validity, which arise from the intimate linkage with empirical evidence. Import is that the research often is complementary to incremental theory. For the process of building theory, from case study research, I took the scheme that Eisenhardt (1989) did create. This is to start with creating the problem definition and research questions that are stated in chapter 1. Then literature is explored in order to find some ground material to answer the research questions. Normally after the theoretical framework is drawn it is time to create propositions because this is a case study. But since the extent of this research is mainly focusing on the research questions this part is not taken in account. The mostly used form of gathering empirical data for case studies is interviewing. I elaborate on this in the chapter 3.2, this is also confirmed by a research conducted by Yin (2002).

A specific case will start with a qualitative research when the methods, that will be used, are clearly determined. In which the sub-research questions are formed based on the research question. From this the coding scheme, to get the right information from the respondents, is formed based on the models of Grönroos (2011) and Flint (2002). In the previous chapter an overview of coding words is given that will be used for the understanding of customer value. In this research customers of Trimergo are taken as the units of analysis. From the results that are based on the analysis an conclusion can be made based on the literature that is set in the theoretical framework.

3.3 Conducting Interviews

Based on a small book that is titled “The Long Interview” (McCracken, 1988) the interview style described is the most powerful method in the qualitative armory. The author makes you aware on issues before going to take an interview and gives tips to get the best and most reliable data.

For the general interview scheme look in the appendix, this is the basis for the long interview that is kept at the customers. Based on the theory and on the research questions I put these questions in four different categories. In order to get a better understanding of the person that is being interviewed, I start with a category that expresses the background of the customer in person. From this a bridge is made to the second part of questions to get a better understanding of this person in his organization. In the third category I try to get information about the way that the customer looks at Trimergo. For this understanding of customer value have a look I took the customer process and supplier process of Grönroos (2011). Finally the strategic part will be discussed in the fourth category. In this part I aim on the future creation of value by Trimergo at this customer.

The following way is how I did my interviews according to the earlier discussed possibilities. I had nine respondents that are all from different companies, all related to the customers of Trimergo or have an influence on the product development of Trimergo. As you can see in the appendix there is a general question list which I used in for having a structure during the interview process, as earlier described. Since

the method used for interviewing was 'long interviewing' a lot of extra useful information was gathered during the sessions. The average duration of an interview was about one hour. During the interviews I made use of a tape recorder in order to make a better transcription later.

Now we come to the part of coding the interviews using the following scheme of Bryman (2012). He makes the coding scheme in four steps that help coding the interview. You can start in stage 1 of the model with analyzing by reading the transcripts and listening to the audio files. You need to get the main themes in this stage and categorize them. After this you start with reading all again and mark in the text words and create key words, for this you need to use coding labels. When this is done we continue going code the text by grouping sections over the different interviews. When this is formed in a table I will use this for stage 4 and try to make relation of codes to the research question and literate. If possible I also will try to look for interconnections between codes.

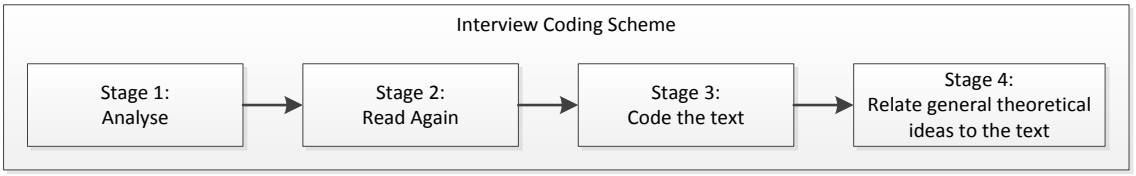

Figure 9 - Four stage coding scheme (Bryman, 2012)

3.4 The Empirical Data Collection – an Overview

To give an overview, from this beginning the following process was used in order to make the research as structured as possible. Firstly I start with determining the problem as you see in chapter 1, from this I collect a lot of theory in order to structure and to set the ground that will be tested during interview. When the interviews are finished the data from the interviews will be coded and then analyzed on specific key-words, taken from the customer process (Grönroos, 2011), that will help to give a clear idea what is expected from customer value and to understand the implications for NPD.

From this analyzing of the interviews a conclusion can be drawn. This is done by taking the case of Trimergo and form a general conclusion from the findings. Besides this conclusion I will try to make specific recommendations for Trimergo.

4 Results and Analysis

In this research the results are mainly relying on the interviews that are hold. For this interviewing I follow the method that is described in chapter 3.

In total nine interviews have been conducted to form a solid basis for me to do an analysis. In the beginning I will start by giving a table that shows from all respondents their aim in the interview for value creation. This can be seen as the first stage of the model given in *Figure 9 - Four stage coding scheme (Bryman, 2012)*.

Respondent	Explanation of Value Creation by Trimergo per respondent
1	Create more interaction between user & system and save time for the customer
2	Implement Trimergo ERP in order to reduce the stress on personnel
3	Out of the box solution that assist a project driven company in a specific branch
4	Assisting in all processes, even internationally, in order to reduce complexity
5	Real-time information available without waiting
6	Get the cost price as low as possible
7	Adopts for the needs of the company to create structure
8	Try to gain more efficiency by having a better overview what is going on
9	Helps to structure the organization, and especially after mergers

Table 3 - Explanation of Value Creation by Trimergo per respondent

In stage 2 of the model of Bryman (2012) I create nine summaries that are formed in several chapters, this makes coding much easier. The summaries start with an introduction in with a description is given about the background of the person, then the second chapter is called interview in which special attention will be for the way that the interview is kept and how the situation was with this person. As a matter of fact, the first two chapters only give you a good situation sketch before going into the topics that really matter.

When now looking to the rest of the summary, it will be focused on Trimergo as a company in first instance to let the customer give an interpretation about Trimergo, this way also the bound between customer and Trimergo later is easier to describe. From this I also asked if they could point me on some improvements within Trimergo. All the text from the summaries is based on the information that is gathered during the interviews.

From this I will go to the chapter in which all the things about value creation start, this is called expected customer demand. Where the customer explains how Trimergo, in their opinion, does operate on the expected customer demand.

In *Table 4 - Overview based on the coding scheme per respondent for the present situation* I created an overview that is the third stage in the coding scheme, there is an overview of all the priorities that were given by the respondents. The scores are from one till five where one is very bad and five is very good.

PRESENT SITUATION	RESPONDENTS									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Average**
Usage analysis	5	3	4	3	3	4	2	3	4	3.4
Purchasing / Order making	3	3	3	3	4	4	3	3	3	3.2
Warehouse / Installing	3	3	3	4	4	3	3	3	4	3.3
Paying / Cost control	3	3	3	3	4	3	3	3	3	3.1
Usage	4	3	2	3	4	4	3	2	3	3.1
Information need	2	2	3	2	3	3	3	2	3	2.6
Problem / Complaints	4	3	3	3	4	3	4	3	3	3.3
Upgrade / Modernization	4	2	3	3	4	4	3	3	3	3.2
R&D / Product development	5	3	2	3	3	4	3	2	4	3.2
Complaints handling / Recovery	4	3	3	3	3	3	4	3	4	3.3

Table 4 - Overview based on the coding scheme per respondent for the present situation

Since I also analyzed the future needs at customers I created the same overview as above in order to put values as the respondent would like suggest see these aspects in the future.

FUTURE SITUATION	RESPONDENTS									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Average**
Usage analysis	5	4	4	4	3	4	4	4	4	4.0
Purchasing / Order making	4	5	4	4	4	4	4	4	4	4.1
Warehouse / Installing	4	4	4	4	4	5	3	4	4	4.0
Paying / Cost control	4	4	4	4	4	5	3	4	5	4.1
Usage	4	5	4	5	4	5	5	5	5	4.7*
Information need	4	5	5	5	5	5	4	4	5	4.7*
Problem / Complaints	5	5	5	4	4	4	4	4	4	4.3
Upgrade / Modernization	5	4	4	4	4	4	5	4	4	4.2
R&D / Product development	5	4	4	4	4	4	5	5	4	4.3*
Complaints handling / Recovery	5	5	5	4	4	4	4	4	4	4.3

Table 5 - Overview based on the coding scheme per respondent for the future situation

When looking closer to Table 5 - Overview based on the coding scheme per respondent for the future situation you can see that there are three average codes with a cross. I placed these crosses in order to highlight the codes that increased more than one on the scale. In general we can assume that on all aspects an improvement is expected by the respondents. From this we can derive that the customer expectations of Trimergo are rising for the future. Particularly in the areas of “Usage”, “Information need”, and “R&D / Product development”.

Based on this data it seems unnecessary to created segments from this group of respondents. In general they are all producers within the same niche market of project driven industries. Although the only difference would be the type of product they produce, but the way they work and gain value with the software is in the essence similar.

When now taking this information in account we can make a proper analysis in what level, according to Kahn et al. (2006), Trimergo is situated and where they should aim to. Currently looking at the respondents' analysis I would assume that the achieved level of NPD process integration is Level 2 (Kahn et al., 2006). This is found because there is a structure in NPD in which documentation is also limited available. The idea generation is structured, where these ideas can come from internal or external sources. But in future this level is not enough to satisfy the customer on the basis of customer value creation. There needs to be a better integration that makes it possible for customers to engage in the NPD process.

Since customer engagement is important for value creation we come to Level 3 (Kahn et al., 2006). Within this level the possibility for customers to engage in the NPD process is much better due to the documentation of the NPD that is available, also for customers. Besides this an idea database is generates where customers also can put ideas and comments on other ideas. If looking to Level 4 (Kahn et al., 2006) I would not see this in the data that was provided during the interviews. This would be more suitable for big companies that work with big development departments. For them structuring the NPD is critical in order to work efficient, within Trimergo this is currently not the case.

5 Conclusion

In this research the aim is to get a clear view on what will happen from now till future with the customer value of customers that use ERP software in the niche market from project driven industries. When this is clear the extend on collaboration between supplier and customer is discussed in order to give an answer on the question wether the NPD needs to be changed.

Firstly I will start by looking at the difference between now and future in the creation of customer value that came from the analysis in chapter 4. I noticed that in general the customers expectation of the value creation by ERP software in the future is more than it is now. I would assume that this is a rational way of thinking that a customer always wants to improve. But three specific aspects are more needed to improve in order to satisfy the customers future value creation needs.

When looking firstly to the usage of the software, the customers want to have software with all the functionallities they need but without having the complexity that it brings. The right balance between all the possible functionalities and the ergonomy & easyness need to be guarded according to respondent 9. Respondent 1 tells us that “the software must be a good fit with the organisation” in order to make it more usefull for the organisation. In this case Day (1990) will argue that you should find the right balance between making a product specific for a company and looking at the costs to make the product superior to a specific customer. I would suggest that in this case the product is already focused on the niche market of project driven industries and therefor not need more differentation based on the knowledge that all customers work according to the project manufacturing systamic.

Now secondly we need to have a look at the way that information need is necessary for customers. Explore more areas that can give better inside in the information that is already in the system. Certainly there are possibilities to get this information by going directly in the database and retreive this, but we must not forget the aspect of usage where we would like to have all information in one mouse click. Respondent 4 states “we like the current dashboard functions, but expect much more in the future”.

From this information need within the software we can make a bridge to the information flows between customer and supplier. Since the aspect of R&D / Product development is also expected to improve, the following needs to be done according to Trott (2005). When making the interaction between customer and supplier more close an shift of innovation model is needed for the NPD. From the interviews it became clear that the ERP software is already formed in a good way but that there is a lack on the integration part of the customer in the R&D / Product development process. From this follows that the current model is the response model and for more interaction the NPD should be changed to the network model. According to Trott (2005) the biggest advantage, but at the same time challenge, is to integrate the customer in the whole process of R&D / Product development.

Now to recapitalize what is researched I try to answer the research question in a concrete way:

"*What are the differences between present & future customer value and what are the consequences for new product development?"*

When looking at the data, which is generated by coding the interviews in chapter 4, I can say that the difference in between current and future customer value are primary based on expectations of the respondents. In general the expected perceived customer value needs to improve overall. With specific areas like "Usage", "Information need", and "R&D / Product development" were more is expected to improve. These aspects are in general result of the fact that the supplier of ERP software is not engaging enough with the customer. To achieve the future customer value a change needs to be made to the NPD process of integrating the customer in the process of NPD. This is done by changing to innovation model of NPD to a network model (Trott, 2005). According to Saarijärvi (2012) all different ways of engaging with the customer create a better understanding where the supplier can create value for the customer.

Recommendations for Trimergo

For Trimergo I would recommend better integration of customers, in a way that they are seen as a partner, in the product development and R&D process. But stay alert on the fact that Trimergo creates software for the project driven industry and not specific for one customer. Besides this I also found in the interviews that there is a need of customers to get more information from their ERP system (database) in the form of dashboard tools which will give more inside on the current processes.

In order to also give some insides that can be relevant in for the case specific of Trimergo I also created this table to help Trimergo understand in what areas the customer likes to have more attention in order to create value.

	RESPONDENT									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**TOTAL**
Partnership between Trimergo and Customer							+			1
More integration possibilities (Email, Office, Finance, etc)	+	+	+	+		+	+		+	7
More verbal interaction with Trimergo about new developments				+			+	+	+	4
Internationalization - Multiple languages, other than Dutch/English		+				+				2
Internationalization - Logistics and Transport control		+		+	+	+			+	5
Software better equipped for Outsourcing		+				+		+	+	4
Trimergo needs to focus on the International market				+	+	+				3
Mobile devices	+		+	+	+	+				5
Less software errors (bugs)		+	+		+			+	+	5
Improve performance		+			+					2
Extend the Help function within Trimergo		+	+	+				+		4
Create a good dashboard tool for management	+			+						2
More user-friendly software / Improve ergonometric			+		+			+	+	4
Improve the system on the area of quality control (ISO norm)									+	1
Quotation configurator									+	1

Table 6 - Overview of all important points by the respondents that are useful to Trimergo

References

Anderson, J. C., & Narus, J. A. (2004). *Business Market Management: Understanding, Creating, and Delivering Value*: Pearson Prentice Hall.

Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report, 13*(4), 544-559. doi: citeulike-article-id:6670384

Bryman, A. (2012). *Social Research Methods*: OUP Oxford.

Day, G. S. (1990). *Market driven strategy: processes for creating value*: Free Press.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review, 14*(4), 532-550. doi: 10.2307/258557

Flint, D. J. (2002). Compressing new product success-to-success cycle time: Deep customer value understanding and idea generation. *Industrial Marketing Management, 31*(4), 305-315. doi: http://dx.doi.org/10.1016/S0019-8501(01)00165-1

Grönroos, C. (2011). A service perspective on business relationships: The value creation, interaction and marketing interface. *Industrial Marketing Management, 40*(2), 240-247. doi: http://dx.doi.org/10.1016/j.indmarman.2010.06.036

Hamel, G., & Prahalad, C. K. (1994). COMPETING FOR THE FUTURE. *Harvard Business Review, 72*(4), 122-128.

Kahn, K. B., Barczak, G., & Moss, R. (2006). PERSPECTIVE: Establishing an NPD Best Practices Framework. *Journal of Product Innovation Management, 23*(2), 106-116. doi: 10.1111/j.1540-5885.2006.00186.x

McCracken, G. (1988). *The Long Interview*: SAGE Publications.

Nambisan, S. (2003). Information systems as a reference discipline for new product development. *MIS Q., 27*(1), 1-18.

Saarijärvi, H. (2012). The mechanisms of value co-creation. *Journal of Strategic Marketing, 20*(5), 381-391. doi: 10.1080/0965254x.2012.671339

Saren, M. A. (1984). A classification and review of models of the intra-firm innovation process. *R&D Management, 14*(1), 11-24. doi: 10.1111/j.1467-9310.1984.tb00504.x

Stake, R. E. (1995). *The Art of Case Study Research*: SAGE Publications.

Stake, R. E. (2005). Qualitative Case Studies. In N. K. D. Y. S. Lincoln (Ed.), *The Sage handbook of qualitative research (3rd ed.)* (pp. 443-466). Thousand Oaks, CA: Sage Publications Ltd.

Trott, P. (2005). *Innovation Management And New Product Development*: Prentice Hall.

Ulaga, W., & Eggert, A. (2005). Value-Based Differentiation in Business Relationships: Gaining and Sustaining Key Supplier Status. *Journal of Marketing, 70*(1), 119-136. doi: 10.1509/jmkg.2006.70.1.119

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing, 68*(1), 1-17. doi: 10.1509/jmkg.68.1.1.24036

Woodruff, R. (1997). Customer value: The next source for competitive advantage. *Journal of the Academy of Marketing Science, 25*(2), 139-153. doi: 10.1007/bf02894350

Yin, R. K. (2002). *Case Study Research: Design and Methods*: SAGE Publications.

Appendix - General Interview Questions

Positive + Negative, explain difficulties (in the past,) now, and future.

1. About You (General impression about the person)

- Could you describe your personal background? (Education / Previous jobs)
- How did you end up with your company? (Background)
- What if you wouldn't work at your current company? (Interests)

2. About (You and) Your Company (General impression about your company)

- How would you describe your company?
- Can you describe the past, now and future-perspective?
- What do you appreciate in your company?
- What are your goals within your company?
- In what way do you create value for your company?
- What can be improved within your company?

3. About you as customer of Trimergo

- How did you hear about Trimergo?
- Why are you interested in Trimergo?
- What can you tell me about the software of Trimergo?
- How would you describe the service of Trimergo?
- In what way the service of Trimergo can create value for your company?
- What software would you use if Trimergo didn't exist?
- Does Trimergo understand the customer?

4. Trimergo software, strategic vision

- What do you expect in the future from Trimergo?
- What is missing in the software of Trimergo?
- In what way Trimergo software can create value for your company?
- How can Trimergo software improve the value for your company?
- Where should Trimergo put the focus when looking at product development?
- Do you see a trend within the development of ERP software?
- For your company, should Trimergo extent or simplify her software?

Comments or Remarks: