Marjo Tiikkaja

VALUE CREATION IN COLLABORATION BETWEEN SOFTWARE SUPPLIERS AND CUSTOMERS: SUPPLIERS’ PERSPECTIVE
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Abstract

This study is concentrated on value creation in the context of the software business, especially the enterprise system solution business. The purpose of this study is to increase both theoretical and empirical understanding of value creation in this specific context through the integration of economic value creation theories and software development.

The theoretical framework includes the perspectives of both the customers and the suppliers, and their interactions during the value creation process. For this study, the main perspective is that of the supplier. The customer, therefore, is like a mirror from which the requirement for action (on the part of suppliers) originates. The main focus is the understanding that the use period is important, which concretises the made-value offering and determines the future of the collaboration. The empirical material is collected through interviews of four software organisations. The research strategy is the qualitative case study, which is fulfilled with the narrative method. The interviews performed were quite expansive, and allowed interviewees to share examples and real-life stories.

As a result of the empirical analysis, the use period is at the heart of the value-creation process, because the software’s success depends on the use experience. Understanding both the reason and the use purpose is the key to support customer’s use process. Learning from the customer’s use process is extremely important and increases everyday interaction. It is true, that the focus broadens from evaluating basic attributes of the relationship as a whole to include an evaluation of cumulative experiences. Satisfaction is strongly linked to behavioural outcomes. While use experiences have been researched widely, but their connection to economic theories (and value in particular) is not very well known. Theoretically, the challenge is to connect abstract value concepts to the more practical area of software business theories. This study finds connection by explicitly tying user experiences with the types of efforts that suppliers make (and the theories that inform these efforts) to create value.

Keywords: collaboration, customer-perceived value, software business, use experience, value creation
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Tiivistelmä

Tutkimus keskittyy arvontuotantoon ohjelmistoliiketoiminta kontekstissa, erityisesti ratkaisuliketoimintaan. Tutkimuksen tarkoitus on lisätä sekä teoreettista että empiirista ymmärrystä arvontuotannosta integroimalla taloustieteen arvontuotantoteorioita sekä ohjelmistoratkaisujen kehitystä ja käyttöä. Ohjelmistojen käyttöä syntynyttä taloudellista arvoa on tutkittu todella vähän, vaikka käyttäjäkokemukset ovat keskeinen osa ohjelmistojen suunnittelua. Taloustieteen, erityisesti markkinoinnin, näkökulmasta arvoa on tutkittu laajasti, mutta tutkimukset keskittyvät asiakkaan ostospainoksiin ja myyntiprosesseihin eivätkä tuotteen palvelun käytöstä saatavaan hyötyn.

Teoreettinen viitekehys sisältää sekä asiakkaiden että toimittajien näkökulman vuorovaikutuksen aikana arvontuotantoprosessissa. Päänäkökulma on toimittajan, joten asiakas on kuin peili josta vaatimukset saavat alkunsa ja jonka kautta tehdyt ratkaisut tulevat näkyviksi. Empirinen materiaali on kerätty tekemällä haastatteluja neljässä ohjelmistoalan yrityksessä. Tutkimusstrategia on laadullinen tapaustutkimus, jota on täydennetty narratiivisella menetelmällä.


Tutkimus yhdistää käyttäjien käyttökokemukset ja toimittajien pyrkimykset vaikuttaa näihin kokemuihin arvonluomiseksi. Käyttäjien kokemalla arvolla on merkitystä sekä ohjelmistoliiketoiminnan kannattavuuden ja kasvuun että käyttäjäkeskeisen suunnittelun kannalta.

Asiasonit: arvontuotanto, asiakkaan nauttimaa arvo, käyttökokemus, ohjelmistoliiketoiminta, yhteistyö
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1 Introduction

Chapter 1 of this thesis describes the context and purpose of the study. The introduction starts with a brief discussion on the background to and motivation for this research. Increasing interest in the dynamic nature of the software business is concretised using terms such as hard competition, short product lifecycles and quick changes in the market. All of these actions require reactions from organisations in the field in order to remain competitive. The environment is strategically challenging and survival is dependent on both long-term relationships and market position. “Know your customer” is often used as a slogan in marketing literature, and nowadays the slogan should be completed with “increase your customer value”. This study examines value creation in the context of the software business.

1.1 Background and motivation

Eggert & Ulaga (2002) define customer value in business markets as the trade-off between the multiple benefits and sacrifices of a supplier’s offering as perceived by key decision-makers in the customer’s organization and taking into consideration the available alternative suppliers’ offerings in specific use situations. The perceived benefits are a combination of physical attributes, service attributes, and the technical support available relative to the particular use of the product as well as to its purchase price and other indicators of perceived quality (Ravald & Grönroos 1996). The concept of customer value also has a strong relationship to customer satisfaction. Both concepts describe the evaluation and judgement of products in use situations. In fact, perceived value may lead directly to the formation of overall satisfaction feelings (Churchill 1982). Customer value has a strong connection not only to a product’s use, but also to the consequences of that use.

As Terry Winograd (1996) indicates in the introduction to "Bringing Design to Software", the design of software "that works —that really works—to be appropriate and effective for the people who use it" requires taking inspiration from other areas of design. From a ‘design’ oriented viewpoint, paying attention to users, making ‘ethnographic’ observation of their practices, and interacting with them will afford the design of complex systems delivering ‘intelligent’ services and transforming users' behaviour, and going beyond the typical outcomes of industrial design.
This paragraph includes several important ideas. Designing the software that really works is a good focus for all development work, but in practice it is more complicated. Taking into account the users, those who really use the software, makes it easier to find ‘the real’ requirements. The delivery of complex systems and intelligent services in tandem provides a solution to these requirements. Getting closer to the users makes it possible to influence their needs and also allows the users to have influence. From a supplier’s perspective, being too customer-oriented is not a good alternative, especially if a customer is not willing to pay for extra-requirements. Staying close to the customer while remaining independent appears to be good advice. From the perspective of economics, it is much cheaper to do what customers want, but it is not a very innovative way to work.

In the case of using software products, customers have to take into account high switching costs and also lock-in. Burnham et al. (2003) define switching costs as the onetime costs that customers associate with the process of switching from one provider to another. When customers simplistically state that “it’s just not worth it” to switch providers, they may perceive impediments ranging from “search costs, transaction costs, learning costs, loyal customer discounts, customer habit, emotional costs, and cognitive effort, coupled with financial, social, and psychological risk on the part of the buyer” (Fornell 1992). According to Messerschmitt & Szyperski (2004), customers are aware of lock-in; they are concerned not only with competitive options but also with being stranded with a supplier who abandons maintenance and upgrades or who goes out of business. Presenting a credible roadmap for future product evolution is helpful, especially when the customer perceives there to be considerable switching costs. Because of that, switching is not a desirable option, and it is assumed that relationships are long-lived. Based on that idea, there is the scope to “get stuck” in a relationship for long period of time.

Customer relationships are often compared to marriages, as opposed to “affairs”, which denote short-term exchanges and transactions. However, recently it was proposed that relationships should be compared to different types of “dances” instead of to the dichotomous marriage-affair metaphor. (Wilkinson & Young 1994). A relationship is based on the notion of ties that connect actors together. Relationships in business networks have been studied mainly from a dyadic point of view, i.e. as encompassing two counterparts. However, relationships may also be approached from the viewpoint of three counterparts, i.e. triads. The number of involved partners and relationships may be increased
further to encompass chains of relationships or a network of relationships. (Holmlund & Törnroos 1997). The strong dyadic relationship remains a base for other structures. From the value creation perspective, the value offering includes all three aspects: product, service, and relationship. (Lapierre 2000). The service aspect is becoming more important, because there is a need for technical support, training, upgrades, and bug fixes both before and during use. This means that the connection between a supplier and a customer has more longevity and is more active than in simple transactions.

According to Srivastava et al. (1999), customer value creation at the macro level necessitates the accomplishment of three organisational tasks; (1) the development of new customer solutions and/or the reinvigoration of existing solutions; (2) the continual enhancement of the acquisition of inputs and their transformation into desired customer inputs; and (3) the creation and leverage of linkages and relationships to external marketplace entities, especially to channels and end-users. To execute these tasks, an organisation must design, foster, and leverage three business processes. The first task is accomplished through a product development management process that aims to create solutions that customers need and want. The second task is implemented through a supply chain management process that incorporates the acquisition of all physical (and increasingly informal) inputs, as well as the efficiency and effectiveness with which they are transformed into customer solutions. The third task is executed through a customer relationship management process that addresses all aspects of identifying customers, creating customer knowledge, building customer relationships, and shaping customer perceptions of the organisation and its products. The starting point is how well and quickly the supplier develops new customer solutions, which will make them more attractive than their competitors. The basic aim is to get customers to select the product offered by focusing on how it meets their needs.

What is the net result of the changing role of consumers? Companies can no longer act autonomously in designing products, developing production processes, crafting marketing messages, and controlling sales channels with little or no interference from consumers. Consumers now seek to exercise their influence in every part of the business system. Armed with new tools and dissatisfied with available choices, consumers want to interact with firms and thereby to co-create value. The use of interaction as a basis for co-creation is at the crux of our emerging reality. (Prahalad & Ramaswamy 2004b). This interaction is based on co-operation and is clear in both consumer and business-to-business markets.
In a conventional setting, companies and consumers had distinct roles in production and consumption. Products and services contained value and the markets exchanged this value between producers and consumers. Value creation occurred outside of the market. However, as we move toward value co-creation, this distinction disappears. Increasingly, consumers engage in the processes of both defining and creating value. The co-creation experience of the consumer becomes the very basis of value. (Prahalad & Ramaswamy 2004b). The definition and creation of value are closely related in several pieces of research because the definition of value is so complex.

If development is based on the needs of end-users, a significant meaning for the entire organisation and business is required. Is this really true? Henry Ford said that if we had asked our customers what they wanted, the answer would have been that they just needed a faster horse (instead of a car). This is based on the idea that customers don’t recognise their needs until a solution is offered. This is a problem in cases where the product is innovative, as software often is. It could be easier to ask a customer what they don’t want rather than what they do want, because it is often difficult to identify future needs.

My personal motivation for selecting the topic of this thesis stems from my interest in who (actors) creates value and how (process). I started wondering where the created value goes and who has influences on it. The use of products makes value visible and through that easier to understand, but at the same time it ties suppliers and customers to the relationships for long time. The users make the difference between a product’s success and its failure, because they use the product in the real world. If a product is not satisfying users and working as expected, they simply don’t use it. The user is often very different to the buyer, but typically at least as important, that is why it is a shame how little attention is paid to the role of the user in the value creation literature. The development process for software products is aware of the importance of the feedback from end-users, and especially the utility of using that kind of information as a base for product development. Nowadays, it is not enough to take into account feedback, users has to be involved in the development process in its early phases in order to garner feedback at this stage.

The research efforts in this area are very limited and leave several questions without answers. Firstly, software product development involves both the developer organisation and the buyer organisation. The software has to be developed, offered, and sold before it is in use. To get it to this use stage is often one element of the project. When the software is in use, it still needs support,
updating, and maintenance. The software product’s lifecycle ends when another version replaces it. The relationship usually continues after the version changes because switching costs are high and switching is complicated. Involvement in the relationship is tight. Who makes the decisions? How much power do customers really have or should have?

Secondly, the user’s role changes during the process. The user is the reason why the software product is developed. How does the user influence the process? How do users use the product and extract value from it? What is the role of satisfaction in the process?

Thirdly, who receives or extracts the value? Theoretically, focus involves offering the best possible value to customers. This can’t be working if some players get nothing because all the value accumulates with one actor. The value has to move to others. What is the utility to other actors? What do they get from the customer value? Who plays the game? Which factors influence it?

And finally, what is the utility of knowing the use-value process? How is it exploited in the business? The aim is to increase market share, to create more satisfied customers, and to beat competitors. At present, long-term relationships are more important than ever before, because it is easier (or cheaper) to keep customers than to find new ones. Finding ways to work together and to communicate openly are important targets throughout the process.

1.1.1 The theory base of value creation

The history of value research is interesting. According to Ramirez (1999), both moral and economic value was studied in moral philosophy until the 18th century, when economics became a field of study in its own right. However, ‘value’ took on a measurable connotation during the 13th century, and formed the basis of the modern notion of exchange value that is frequently applied to traded assets. For example, Porter (1985) in his book ‘Competitive Advantage’ defines value in competitive terms; value is the amount that buyers are willing to pay for what a firm provides them. The concept of value is now researched in several ways.

The management literature on value is generally clustered around three categories of value: financial economists advocate shareholder value, marketeers advance customer value, and stakeholder theorists promote stakeholder value. Customer value, however, is the source of all other values. (Khalifa 2004). Several authors link customer value to implementing competitive advantage strategies (e.g. Slater & Narver 2000), customer-oriented management approaches
(e.g. Sinha & DeSarpo 1998), and marketing’s concern for buyer-seller exchanges (e.g. Holbrook 1994). The role of the customer has changed from that of passive target to being a more active, even co-operative, partner (e.g. Normann & Ramirez 1994).

*The strategic literature* clarifies the role of partners and a competitive business environment. According to Ehret (2004), traditional buyer-seller concepts focus narrowly on the value created in a dyadic buyer-seller interaction. Customer portfolios have not only to reflect the lifetime value of the set of relationships a company is engaged in, but also to account for its position in the overall network. Furthermore, as competition is always present within networks, a dominant goal is to reach a formidable value position within the network. As network competition forces companies to focus on activities that they can perform in the most effective and efficient way, the identification and cultivation of core competencies become central tasks of management.

*The marketing literature* was once focused on dyadic relationships, but has evolved to make a network perspective more widely accepted. In buyer-seller relationships, the focus has moved beyond individual firms to value-creating networks formed by key firms in the value chain that deliver value to the end consumer (Kothandaraman & Wilson 2001). The three core building blocks of the theories are superior customer value, core competencies, and relationships. The creation of value depends on the ability to deliver high performance in the benefits that are important to the customer. What gives firms the ability to deliver performance in these important benefits is their competency in technology and in business processes. The drive to create value requires the assembly of core capabilities that go beyond the capabilities within the firm. Putting together a network of firms in order to build a set of capabilities that are necessary for building a market offering that delivers high value to the customer becomes a major strategic thrust for firms. One of the main ways that firms assemble this network is through developing strong relationships with key partners who can add value to the market offering. (Kothadaraman & Wilson 2001).

The model uses the three core concepts of value creation, namely *superior customer value, core capabilities, and relationships*, to propose a reciprocal model that captures the nature of interrelationships between the three core concepts. The model starts with the objective of the value-creating network, namely creating superior customer value. The extent of value creation by the network is influenced by the core capabilities of the member firms. In other words, the combined core capabilities of the member firms create superior customer value.
value. The way the firms in a network combine to create this value is influenced by the nature of the relationships that the firms have between themselves. Thus, the quality of relationships facilitates the creation of value. If the inter-firm relationships are problematic then the core capabilities cannot be combined in an efficient manner. Relationships also hold the network in place and thereby help the firms to continue to invest in order to maintain and improve their core capabilities. The firms in the network also realise that their value to the network is only to the extent they bring in diverse core capabilities that are valued by the network. Firms seek to develop relationships with those firms that have unique capabilities. Therefore, core capabilities can constrain the quality of the relationship between firms in the network. The final value that customers in value-creating networks want determines the nature of the member firms’ core capabilities that will be valued by the network members. If faster delivery of goods is of value to the customer, then the network will look for firms that have superior logistical capabilities. Finally, when customers appreciate the value delivered by a network, the morale of its members is boosted and this reinforces the quality of relationships between the members. Thus, the relationships between the three core building blocks of value-creating networks are modelled as reciprocal paths connecting all three building blocks. (Kothadaraman & Wilson 2001).

*Interest in exchange relationships* is also growing from the perspective of creating and delivering value (Wilson & Jantrania 1994, Grönroos 1997, Anderson & Narus 1999, Payne & Holt 1999, Tzokas & Saren 1999, Christopher *et al.* 2002, Donaldson & O'Toole 2002, and Ballantyne *et al.* 2003). Of course, the co-creation (or co-production) of value through interactions between a customer and supplier (in a service encounter) has long been one of the core tenets of service marketing and the cornerstone for much thinking on relationship marketing (Ballantyne 2004). Rushing into relationships without adequate consideration of how value is to be created and shared is a “lobster pot” marketing approach – one or more parties can get “caught” and then live to regret their decisions over time. Putting this in economic terms, investing in business and industrial relationships creates positive financial returns as well as exit barriers (structural bonds), where exit costs apply. (Wilson & Möller 1995). Investment in these relationships also increases the extent to which all parties are engaged.

*Kaarino *et al.* (2003) introduce the concept of selling value. *The selling of value* is about selling business impacts, rather than products, services, or solutions.
that result in increased profits for the customer. The value of selling has two dimensions. First, selling needs to bring value to the customer during and after the sales process as the business impacts of the renewed operating model start to mobilise. Second, selling needs to bring value to the provider by generating strong and steady cash flows, which compensate for the costs of the resources allocated to developing the customer relationships. Customer relationships need to be viewed as assets, and the role of the sales function is to increase the value of those assets.

An interesting point to note is that Kaario et al. (2003) use both the customer’s and end user’s process for creating value. They assert that by knowing the customer’s customer it is easier to offer the right kind of solution to the customer. That kind of offering supports customer’s actions and makes it easier to offer the right solution to the end-user. According to Kaario et al. (2003), customer process innovation refers to a thorough analysis of the selected business process of the customer in order to identify ways in which to improve it or to replace it with a totally new kind of process. This requires a good understanding of the customer’s customer as well as the ways in which the customer strives to create value for its own customers. The product oriented sales team focuses on enhancing the company’s internal processes to provide more value to the customer. The solution sales mode focuses more on creating solutions from the perspective of the customer’s process. A value sales-orientated organisation needs to focus on finding new ways to improve customers’ business processes and thus to improve customers’ business results. Furthermore, the sales force needs to have an in-depth understanding of its customer’s processes and of their customers’ processes and it must also have an understanding of its own capabilities and those of its partner organisations.

Value theories are interested in customers and how to become closer to them. Taking end users into account is a new situation, because they have different influences on the process. Kaario et al. (2003) see the end-user’s process as a possibility to offer more satisfying solutions to customers and support them to offer better solutions for their customers (end-users). Offering better solutions is an important starting point in the software business too. The next chapter describes the software business from an empirical context and considers how users are taken into account.
1.1.2 Software business from an empirical context

The value network displays a natural positioning of business functions, from software creation to its use. Companies tend to form around individual units of value that enhance internal synergies and exploit common competencies and expertise, so the organisation of the industry itself is partitioned around this value chain. This partitioning displays the desired characteristics of modularity: strong cohesion of function within modules and weak coupling of function among different modules. Of course, there is coupling, which forms natural boundaries for business relationships within the industry. Weak coupling is a more important property of modularity than strong cohesion because a hierarchical decomposition of a module lacking strong cohesion into sub-modules with stronger cohesion is possible. This phenomenon can also be observed in an industrial organisation. For example, while software creation is a natural unit of decomposition, it is also an impractically large activity for any one company to encompass in its entirety, and thus further decomposition of the industry into more specialised areas, such as application, infrastructure, and embedded and component software is observed. Some companies pursue and exploit synergies in two or more of these areas. (Messerschmitt & Szyperski 2003).

The main idea of the value chain is to describe how the product has to be focused on the end-user organisation. The product goes through different actors and it changes during its journey, but all actors try to offer the best possible solution to meet the requirements of the end-user. A system integrator plays a special role in the middle of the process. A system integrator takes responsibility for acquiring the software from application and infrastructure suppliers, makes all the software work together and with the supporting infrastructure equipment, and installs and tests the software. The value added by the system integrator stems from the emergent capabilities that arise from the integration process. (Messerschmitt & Szyperski 2003). In the value chain described above, a value network exists in which all actors influence each other, in both positive and negative ways. The organisation’s position in the network bears significant meaning for its future. In particular, involvements influence who co-operate and share resources.

Regardless of the industry, almost all companies operate on faster evolutionary tracks and face greater risks than at any time in the past. Thus, a company’s real core capability is based on its ability to continually redesign its value chain and to reshuffle its structural, technological, financial, and human
assets in order to achieve maximum competitive advantage. But competitive advantage is, at best, a fleeting commodity that must continually be fought for and won. That is, all players in the value chain – producers, suppliers, employees, retail channels, and customers – also seek their own competitive advantage. This competitiveness makes every value-chain dynamic. (Mascarenhas et al. 2004). In this context, meaningfully involving target customers at every touch-point in the value chain can bring renewed market freshness and competitive vigour to the suppliers, employees, designers and engineers, systems and subsystems, the processes and products, distributors, and to the marketeers that constitute the value chain. Every part or member of the value chain can be affected by (and in turn affect) the changing customer preferences. (Mascarenhas et al. 2004).

According to Boehm (1996), for a few golden moments in the mid-1970s, it appeared that the software field had found a set of common anchor points; a sequence of milestones around which people could plan, organise, monitor, and control their projects. The milestones were those in the waterfall model. They typically included the completion of system and software requirements, preliminary design, detailed design, coding unit testing, software acceptance testing, and system acceptance testing. These milestones let companies, government organisations, and standards groups to establish a set of interlocking regulations, specifications, and standards that covered the full set of software project needs. Several other models have since been developed but the waterfall model remains the most significant.

Creating a successful product requires identifying market needs and translating them into a product vision and scope, which are then executed following sound project management principles. Product management is the role of governing a product from its inception to delivery in order to generate the greatest possible value to the business. Requirements are the basic building blocks gluing together different phases of the product lifecycle—the sum of all activities needed to define, develop, implement, build, operate, service, and phase out a product and its related variants. (Ebert 2006).

Garvin (1984) defines user perceived quality as the combination of product attributes that provide the greatest satisfaction to a specified user. ISO/IEC 9126 (1991)¹ categorises the attributes of software quality as: functionality, efficiency,

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usability, reliability, maintainability, and portability. To the extent that user needs are well defined and common to the intended users, this implies that quality is an inherent attribute of the product. However, if different groups of users have different needs, then they may require different characteristics from a product in order to meet their purposes. An assessment of quality thus becomes dependent on the perception of the user. (Bevan & Azuma 1997).

Hartwick & Barki (1994) highlighted the fact that the terms user participation and user involvement have often been used interchangeably, but that the terms do not have the same meaning and that the two should be clearly distinguished. They define user participation as "a set of operations and activities performed by users" during system development and reserve the term user involvement for a "subjective psychological state", which influences user perceptions of the system and thus affects system success.

According to Cavaye (1995), there is no guarantee that user participation is effective in contributing to the final outcome of a project. It is a process that takes place over time and involves interaction between users and developers. Users contribute to ensure that the system will conform to their needs; system specialists contribute to the process to ensure that good use is made of technological opportunities.

Usability should apply to the development of entire product families and extended projects where several versions of a product are released over time. The term lifecycle is usually defined (IEEE standard 100-1988) as starting when a software product is conceived and ending when the product is no longer available for use. The usability engineering lifecycle extends beyond this period because of the impact of usability decisions on future products and their lifecycles. It has to consider not just how an interface design meets current needs, but also whether it conflicts with the skills users have acquired from previous interfaces and whether it seems flexible enough to be extended for future interfaces. In fact, users are becoming less willing to put up with difficult or uncomfortable interfaces since experience with some current interfaces has shown them that software can indeed be easy to learn and pleasant to use. (Nielsen 1992).

Usability relates to how a system interacts with the user, and it includes five basic attributes: learnability, efficiency, user retention over time, error rate, and
satisfaction (Ferré et al. 2001). According to ISO 9241 Part 11\(^2\), usability is "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use.” This definition ties a system’s usability to specific conditions, needs, and users—it requires establishing certain levels of usability based on the five basic attributes.

According to Nielsen & Faber (1996), the goals of increased usability and decreased development time conflict with traditional usability engineering approaches. The design process always requires several rounds, where interfaces confront users’ needs and capabilities are modified accordingly. This approach is called iterative design. According to Jokela (2001), the prevailing paradigm of developing usable products and systems is user-centred design (UCD): usable products are created through processes of UCD. The existing literature (e.g. Nielsen 1993, Holtzblatt & Beyer 1993) incorporates the same basic principles for developing usable products and system, such as user involvement, iterative design, and multi-disciplinary teamwork.

System usability broadly encompasses those factors that affect how easily a user can use a system, or, how user-friendly it seems from the end-users’ perspective. Usability refers to how people work with the product. Usability means that the people who use the product can do so quickly and easily to accomplish their own tasks. (Dumas & Redish 1994). In particular, communication problems between system developers and users result in the failure of the human factor aspects of the system; that is, the user is unable to effectively use the system (Fisher 1999). It is not sufficient for the system to solely interact with the user, the developer must do so too.

Although usability is obviously a significant source of value, the customer often has a broader agenda. For example, the customer might want to increase productivity, which can reduce the number of users. Moreover, the customer has many costs other than software acquisition—for example, provisioning, deployment (including process changes and training), administration, and management of the software installation.

Systematically reducing recurring operational costs and the costs of business process changes and training offers considerable leverage because these costs often dwarf the cost of software acquisition. Reducing customer costs allows

increased prices (more revenue) and leads to an increased surplus (competitive advantage and more unit sales). (Messerschmitt & Szyperski 2004).

1.2 Purpose of and research questions in the study

The purpose of this study is to define value creation and inspect it in the context of the software business. The focus is on how value is created and exploited in the software business context. It is important to note that understanding the concept of value makes it more concrete and easier to explain why it is important. The software product’s lifecycle is an important aspect, because the software product is not the final version when it is sold, as it is with some industrial products. The software product’s properties change and updates and maintenance influence the software. In practice, the supplier has several opportunities to make changes to the software product during its lifecycle. The supplier makes the development work and based on that also the business. The supplier tries to make the best profit with the resources it has. It needs customer(s) to utilise the developed products/services. Customers don’t make products/services by themselves, they only buy what they need and use it to their own purposes. The value creation process needs both of these actors to be completed.

Customers want to solve a problem and to find a solution. They are not really interested in the software product and how it is developed, not even its highly innovative features. The focus is on their problem and how they can find the best—or cheapest solution to it. In practice, the actual use of the software product really tells how good or bad the solution is. This means that also customers and users can have different targets. From value perspective value is realised through the use. If the product/service is not used, it is not utilised. The value comes visible only if someone makes something with the product/service. This is the main reason why customer-perceived value has an important role in this research.

So, business success is dependent on all three actors. If all goes well, users continue the use the software, customers continue buying it and suppliers continue developing it. What factors influence the software use and the creation of value? How is the software created and what is its utility? Why is it important? Figure 1 describes the starting points in this study.
The supplier’s role is to produce a software product, which is based on customer needs. The supplier has to support the use of the product and take care of updates, training, and maintenance during the product’s lifecycle. The customer’s role has become more active, and customers are now co-producers, or at least part of the development process. The focus is on being co-operative, supportive of each other, and on trying to find the best ways to create value. The relationship between the two actors is interactive, consists of several actions, and is based on trust and involvement. How does it work? What kinds of processes are needed? What is the nature of the interaction? Where is the value created? Who can influence the process or the value? Based on these questions, I have identified both the main research question of this study and several sub questions that support it.

“How is value created in the context of the software business?”

1. What is the concept and content of customer-perceived value?
2. Which factors influence the creation of value perceived by customers?
3. How is the significance of exchanges seen in value creation?
4. What is the use value and how is it made visible?
5. What is the best way to exploit the value creation collaboration in the software business?
1.3 Strategies used to find answers to the research questions

In this section I clarify how I search for the answers to my research questions. I started with theories, looking at what other researchers have done and the answers they found. I found some interesting theories, but not direct answers, so there was a clear need for this new study.

Theoretically, the most important starting point is the value creation literature, which I have read since my master’s thesis started. Value creation theories are quite complex, because they are not focused on whole processes. Every article describes little pieces of the view and even the terminology differs – all sufficient to cause a headache, but fascinating nevertheless. Value creation is a base for any business action, so it plays a significant role. This role is largely researched, but simple answers to its workings are hard to find. Value creation theories are used to describe general value creation, customer value from several views and also relationships. Relationship theories clarify interaction, exchanges, and involvement—all of these common and co-operative aspects describe the connections between a supplier and customer.

Software business is viewed in an empirical context. In this study, the focus is not only on the business aspects, but also on the connection to the development process. Software business is dependent on the development. Especially if product development is not working, the product’s lifecycle will be brief. The product demands development during the lifecycle, because updates and maintenance keep it going. When the product has come to the end of its lifecycle, a new version should replace it. The organisation needs a product portfolio in which products are at different phases in their lifecycles. Software business, software development, and software product lifecycles are all important parts of the theory. The starting point of this study was to concentrate on the software product business, but it is difficult to ignore service. Software products and services are committed, and even software product organisations offer help and support for customers. Products and services combine to solutions.

Recognising a customer’s needs is the starting point in the development process. Getting customers, or more specific users, involved in the development process makes it easier to identify their needs. The user’s role and use of the products are researched in the usability and user-centred design literature. Questions regarding what the product attributes are, what makes a product easy to use, or what makes a good product should be asked and the answers discussed. Theoretically, these topics are familiar in user-centred design and usability.
research, but not from the value perspective. The framework of this study is based on the supplier’s side and the customer’s side, and on the interaction between them. The supplier’s side is connected to the software product’s lifecycle—how is value offered, delivered, and supported? The value proposition consists of the product, service, and the relationship—each of which can be the factor that determines why a customer selects a particular offering. The customer’s side includes the customer value creation process, which identifies how satisfied the customer ultimately is. The most important phase is the actual use of the product. The interaction between customers and suppliers connects the processes, and it is described in terms of the relationship perspective.

1.4 Outline of the study

This study consists of eight chapters. First, an introduction to the research area and the theories used is provided. In the second chapter, consideration is given to the value creation theories already extensively researched. Value creation is complex and is quite an abstract area of research consisting of several viewpoints. A major problem is that the omission of an element makes understanding the topic more difficult. The third chapter focuses on the software business and the characteristics of a software product. The software business is a young and developing business area, which does not have a long history compared to traditional business areas. This makes it an even more interesting area to research. The fourth chapter connects both of the theory chapters and presents the software oriented use value model. This is a preliminary model, which is going to be developed when the empirical material is collected. Chapter five presents the research design. Chapter six presents the empirical part of this study. Chapter seven presents a discussion of the main findings. Finally, chapter eight provides a conclusion to this study.

Chapter 1: Introduction
Chapter 2: Processing customer-perceived value
Chapter 3: Software business
Chapter 4: Software oriented collaboration value model
Chapter 5: Research design
Chapter 6: Empirical study
Chapter 7: Discussion
Chapter 8: Conclusions
2 Processing customer-perceived value

In this chapter the content and concept of customer-perceived value is discussed, together with the factors that influence value. The time frame is before, during, and after the product is bought, and the focus is on the use of the product. Supplier’s role is to develop and offer products, but the value is realised from customers’ viewpoint, when the product is in use. Customer-perceived value has a direct connection to relationship value, which is also a key factor to analyse. Both can be viewed from several perspectives and this makes them easier to understand. Business relationships are so widely researched that it is impossible to go through all of the theories, so the focus is on the buyer-seller relationship and how it develops and changes over time.

2.1 Starting point

One important reference is Woodruff’s article: Customer value: The next source for competitive advantage (1997). In this article, Woodruff addresses the question of “what are the implications for managing organisations in the next decade and beyond?” Further, according to Woodruff (1997), we need a richer customer value theory that delves deeply into the customer’s world of product use in their unique situation. In part, this new theory should help us understand how customers form preferences that reflect desired value. The expanded theory should also explore the linkage between customers’ preferences for desired value, evaluations of received value, and overall satisfaction with the framework, by considering the customer value hierarchy. Such a theory will have an important impact on what organisations will learn about customers in future. The time frame expands from the current to the future by considering the learning aspect.

Equally important, there is a need for a theory to describe how and why customers’ desired value changes over time, from purchase to use or over multiple-use occasions (Flint et al. 1997). A theory for customer value changes could be the cornerstone for developing processes and techniques for predicting that change. Doing so would expand the lead time for sellers, allowing them to determine how to take advantage of opportunities created by that change. Further, because existing customer value theory typically assumes the latter context, new research should focus on building theory to understand how customers perceive the value from long-term relationships. Will the customer value theory for understanding seller-customer relationships be significantly different from the
theory devoted to understanding customer value that drives individual sales transactions? (Woodruff 1997). Furthermore, what is the value from long-term relationships? Why do customers remain in relationships? From the value perspective, it could be assumed that customers continually pursue greater value.

It is perhaps surprising that firms often do not know how to define value, or how to measure it (Anderson & Narus 1998). In fact, there has been only limited research examining what value is, despite its importance to marketing and little research effort has been devoted to examining what this value is, how it is produced, delivered, and consumed and how it is perceived by the customer (Tzokas & Saren 1999). This belief is echoed by Woodruff’s (1997) demand for a richer customer value theory that delves deeply into the customer’s specific world of product use. The concept of value is presented in several researches, as it is in this study, because it is a base for understanding why it is worth aspiring to.

Further, Lindgreen & Wynstra (2005) propose that there are two main avenues or perspectives for future research: one focusing on the value of products and dealing with the value of relationships. Apart from these two avenues, three major themes within value in business markets can be identified: value analysis, value creation, and value delivery (Anderson & Narus 1999). Within value analysis, issues in the area of organisational buying behaviour include: how do customers analyse value? Within value creation, new offering realisation (innovation and product development) is the core process: how can firms use value appraisals and tools like value engineering in (market-oriented) product development? Within value delivery, a core theme is supply or value chain management: which actors in the chain create value, and which delivery process provides the best value for a variety of customers?

Vargo & Lusch (2004) in their article: Evolving to a new dominant logic for marketing, believe that the new perspectives are converging to form a new dominant logic for marketing, one in which service provision rather than goods is fundamental to economic exchange. The authors explore this evolving logic and the corresponding shift in perspective for marketing scholars, marketing practitioners, and marketing educators. Briefly, marketing has moved from a goods-dominant view, in which tangible output and discrete transactions were central, to a service-dominant view, in which intangibility, exchange processes, and relationships are central. Their service-centred dominant logic represents a reoriented philosophy that is applicable to all marketing offerings, including those that involve tangible output (goods) in the process of service provision.
Further, according to Grönroos (2008) in one of their original propositions about a service-dominant logic, Vargo & Lusch (2004, 2008) viewed *customers as co-producers*, but later changed this view into *customers as co-creators of value*. Gradually, the issue of value creation has become a central issue in the discussion of whether service as a perspective or logic can offer marketing something new. The discussion of service logic has been preoccupied with what service does for customers, and conclusions for marketing management have been drawn from this perspective. However, service as a logic is more complicated than this view implies. It has at least two aspects, viz. a logic for consumption and a logic for service provision. These two aspects of service logic are, of course, intertwined with and dependent on each other. Furthermore, the provider logic has to be geared towards the customer logic. (Grönroos 2008).

According to Payne et al. (2008) central to service-dominant logic is the proposition that the customer becomes a co-creator of value. This emphasises the development of customer–supplier relationships through interaction and dialog. However, research to date suggests relatively little is known about how customers engage in the co-creation of value. This new logic is widely discussed and even accepted in value creation research, and it gives an interesting spice to this study’s software context.

The next chapter defines general value creation, which forms the base for customer-perceived value theories. The concept of customer-perceived value is explored by looking at factors influencing it and how it is constructed. The process of how to create value is then focused on. Relationship theories are connected to the process through various interactions and exchanges, which explain the connections and co-operation aspect.

### 2.2 Value creation

As a starting point, what is the big picture in relation to value creation? Walters & Lancaster (1999) offer three basic definitions:

1. Value is determined by the utility combination of benefits delivered to the customer less the total costs of acquiring the delivered benefits. Value then is a preferred combination of benefits (value drivers) compared with acquisition costs.
2. Relative value is the perceived satisfaction obtained (or assumed available) from alternative value offers.
3. A value proposition is a statement of how value is to be delivered to customers. It is important both internally and externally. Internally it identifies the value drivers it is attempting to offer to a target customer group and the activities involved in producing the value together with the cost drivers involved in the value producing activities. Externally, it is the means by which a firm positions itself in the minds of its customers.

Webster (1994) suggests: The value proposition should be the firm's single most important organising principle. Webster (1994) states that the conclusion that market share determined profitability (has) proved to be simplistic - strategy must be based on an analysis of the company, the competition, and the customer, identifying those opportunities for the firm to deliver superior value to customers based on a firm’s distinctive competencies. The firm’s value proposition becomes the primary organising force for the business. Both Webster (1994) and Kotler (1994) compare the traditional transaction process with the increasingly favoured view of marketing being based upon value creation and delivery, and upon developing long-term relationships with suppliers and customers. Webster (1994) suggests: “Our definition of marketing is built around the concept of the value chain. Marketing is the process of defining, developing, and delivering value.”

One basic assumption in the industrial network approach is the existence and significance of business relationships. These relationships with customers, suppliers, and other organisations represent strategic resources in three different ways. Firstly, a company’s relationships are important resources in themselves. Often, a few relationships account for the vast majority of a company’s sales income and procurement expenditures. When it comes to technical development, each individual firm is also increasingly reliant on relationships with other firms. Secondly, direct relationships connect a focal company to the rest of the network of which it is part. Every relationship is not only a bridge between two actors but also a reflector—or a projection—of these connected relationships and their inherent resources. Thirdly, the relationship combines the physical and organisational resources of a company with those of its counterparts. Therefore, a significant part of a company’s total resource base is located beyond its ownership boundary and is controlled bilaterally with other firms. (Gadde et al. 2003). Companies are dependent on both relationships and deep networks. Networks connect companies to positions, where their actions cause reactions. In this study, the focus is on customer-supplier relationships, but it is important to remember that actions have wider influences in a network.
Interacting is the most fundamental activity of a company. This interaction is rooted in the exchange of products and services and concerned with how two companies choose to organise the flows of goods and information between them. These actions cut across the boundaries of several companies and form chains of activities, such as distribution channels and supply chains. The activities constituting a chain are interdependent and related through links, which may be loose or tight. Together, the activities form an organised entity with network properties. By relating its own activities to the activities of its counterparts, a company can utilise the interdependencies that exist among the activities of the different actors. (Gadde et al. 2003).

In interaction/network studies, the traditional use of two aggregation levels of interaction, i.e., short-term episodes and long-term processes, provides only a limited analytical depth when applied to describing the contents of relationships in different levels of aggregation within a particular relationship or to capturing different structures in different types of relationships. In order to offer deeper analytical descriptions of business relationships, an extended number of aggregation levels of interaction need to be constructed. In this way, interactions are categorised into five types of relationship interactions at five different aggregation levels; action episode, sequence, relationship, and partner base. The levels are hierarchical and range from a single individual exchange that takes place within a relationship to the portfolio of relationships of one particular firm. These interaction levels represent different levels of analysis of various relationship interactions. (Holmlund 2004). These levels of analysis are connected to the time cycle and how long actions last. The idea is that longer actions develop into relationships and are deeper than only short-term episodes.

High-quality interactions that enable an individual customer to co-create unique experiences with the company are the key to unlocking new sources of competitive advantage. Value will have to be jointly created by both the firm and the consumer. Co-creation puts the spotlight squarely on consumer-company interaction as the locus of value creation. Because there can be multiple points of interaction anywhere in the system (including the traditional point of exchange), this new framework implies that all the points of consumer-company interaction are critical for creating value. Since no one can predict the experience a consumer will have at any point in time, the task of the firm is one of innovating robust experience environments. (Prahalad & Ramaswamy 2003).

Interaction connects actors together. It is a base for relationships, because relationships can be seen as a consequence of interaction. Relationships are
processes, which start from first contact. The period of contact can be short and may not be directed to relationships. Interaction is important, but what is value and how it is created between actors? The next section, explains the concept of value.

2.2.1 What is value?

Value in business is considered to be the monetary worth of the economic, technical, service, and social benefits a customer firm receives in exchange for the price it pays for a product offering, taking into consideration the prices and products offered by competing suppliers (Anderson & Narus 1998, 1999). Price in business markets is what a customer firm pays to a supplier firm for its product offering. It is not the total cost, because price does not include, for example, acquisition costs or conversion costs. In business markets, the value provided nearly always exceeds the price paid. (Anderson et al. 2000). Anderson & Narus (1998) define this difference between value and price as the customer’s incentive to purchase. Thus, raising or lowering the price of a product offering does not change the value that the offering has in the customer’s application, only the customer’s incentive to purchase that offering. The customer’s incentive to purchase seems to be determined by their freewill to select the most pleasant offering.

Levitt (1983) suggested that the offering could be viewed at four levels: core or generic product, expected product, augmented product, and potential product. The core or generic product consists of the basic physical product, for instance a videocassette recorder. The expected product is the core product together with minimal purchase conditions, for instance a manual and a one-year warranty when buying electronic equipment. The augmented level is where the company has a chance to differentiate itself from its competitors. The aim is to improve the customer-perceived value by adding services and benefits, which are preferred by target customers. At the fourth level is the potential product, namely all the augmentations and transformations the product might ultimately undergo in the future. It refers to the product’s possible evolution over time as the company creatively searches for new ways to satisfy consumers and distinguish its product offering.

Kotler (1994) describes a product as consisting of five different levels which are almost identical to those of Levitt – the only difference is that Kotler distinguishes between the core benefit, e.g. the utility the buyer actually wants (a
hole) and the generic or physical product (a drill). So, the starting point is that an offering includes a product, which a customer wants to buy, and is based on the current or potential benefits minus the price.

This is not the only truth, because Grönroos (1990) sees an augmented service offering as a package of a core services supplemented with supporting and facilitating services and goods. In addition to these elements, the augmented service offering also includes accessibility of the service, customers’ interaction with the organisation and customer participation in the production process. So, the offering can be also be a service and include some interaction.

Komulainen (2010) has researched in her study what kind of value customers perceive from emerging technological service. In addition, value sub-elements have a complex interaction in service value co-creation, since certain sacrifices made by users may increase the benefits they perceive, whereas some benefits can increase the sacrifices and thus reduce the customer perceived net value. Further, learning is needed from the customer to be able to use the new technological service and utilise it effectively, which in turn leads the customer to perceive higher value from the service. Moreover, the temporal dimensions of value are connected to each other through the customer’s learning that varies according to its type and object at different points of time. (Komulainen 2010).

The concept of value, however, is one of the most overused and misused concepts in the social sciences in general and in management literature in particular (Leszinski & Marn 1997). It is used in diverse fields such as finance, economics, management, information systems, ethics, aesthetics, justice, social equity, and fairness (Normann 2001, Wikstrom & Normann 1994). Further, value is discussed in many streams of marketing literature including: relationship marketing, pricing, and consumer behaviour – in total quality management literature, and strategy literature (for example, de Chernatony et al. 2000).

The competence literature (together with the closely related resource-based literature) looks at what constitutes a company’s basis for action. The strength of this literature lies in conceptualising how the actions of a company can be translated into superior business performance. Competencies are complex bundles of skills and resources, which enable the company to achieve superior performance to the extent that they result in superior perceived value in the market and are not accessible to or can be substituted by competing companies. (Prahalad & Hamel 1990).

Parolini (1999) develops a methodology based on the value concept as a tool for competitive strategy. She differentiates between three types of net value: the
net value created by the system, the net value received by the final customers, and the net value acquired by value-creating players. Each type of net value is defined as follows: The net value created by the system is the difference between the gross value that a customer assigns to a product or service (regardless of its purchase price) and the overall costs sustained by the Value Creating System in producing it. The value attributed to a product is directly related to the benefits that consumers expect from it and is inversely related to the costs associated with its use (accessory or complementary goods, maintenance and other post-purchase costs). The total net value created by the system is divided between the final customers and the economic players participating in its creation on the basis of their relative bargaining power. The net value received by the final customers is the difference between the value that customers attribute to a product and the price actually paid for it. The total price paid corresponds to the total revenues received by the players involved in value-creating activities. The net value acquired by value-creating players the difference between the total price that the purchasers have paid to the players carrying out value-creating activities and the total costs that the latter have had to bear. (Parolini 1999).

A supplier creates a product offering, which includes a product or service that benefits the buyer. The product can include different layers, which make it more attractive in the customer’s eyes. These layers are based on expectations, which can be realised immediately or in the future. The question is how customers see the product, and what kind of feelings they have about it. Created expectations are the main reason to buy a product, and they may explain how suppliers can influence expectations. The price is not the same as total costs, but it is generally used in literature. Total costs could be difficult to calculate beforehand. So, the value can be seen as combination of expected benefits and sacrifices. The next section looks at how value is created.

2.2.2 How to create value?

The most traditional way to describe value creation is to use value chain theory. This theory is well known and largely accepted in value creation literature, but its critics and alternative theories have surfaced. A value chain consists of primary activities and support activities.

Porter (1985) explained the sources of cost reduction and differentiation within a firm and first introduced *the concept of a value chain* (which consists of strategically important company functions or activities that create both costs and
A value chain is not a collection of independent activities but a system of interdependent activities (Porter 1985). It is the impact of transactions on value-chain activities that determines the longer-term economic benefits and strategic advantages of firms. Transactions can either optimise the collective actions of the firm or minimise its total costs in comparison to competitors. A value chain consists of both primary activities (such as inbound logistics, operations, outbound logistics, marketing/sales, and service) and secondary support activities (such as purchasing, technology development, human resource management, and firm infrastructure). These secondary support activities typically represent the principal trading interface with external partners in terms of the firms’ managerial, administrative, and legal involvement with each other. Value-chain activities are organised around routine, repetitive processes. (Porter 1985). Porter assumes that processes are linear and always occur in the same order. This theory is general and quite difficult to connect in a complex reality, especially if there are some special customers.

According to Nordberg et al. (2003), contracts with “special” customers (scientific research institutions), require the use of non routine technology, which can cause “disruptions” in a supplier’s value-chain activities. While only exploratory, the findings from their study suggest that even in fixed-term contracts, suppliers can strategically manage customer relationships to enhance their competitive advantages through technological innovation. Acquiring this technological knowledge, however, requires tremendous effort. In a high technology environment where volumes are low and the labour component is high, deviating substantially from routine production requires significant effort in testing and quality control processes. Prahalad & Ramaswamy (2004a) suggest that in a traditional system, as firms decide the products and services they will produce, by implication they decide what is of value to the customer. In practice, consumers may play little or no role in value creation. Ramirez (1999) goes deep into the historical roots of co-operation in value creation.

Normann & Ramirez (1993, 1994) extended the notion of services to cover all activities in which obtaining actual utility value requires customer value creation. They termed the link between the actions of suppliers and customers as ‘offerings.’ The value of offerings is only partially established in terms of the activity, which the supplier has poured into these and which these offerings ‘crystallise’. Two other conditions are also required for the offering to be of value: (a) the labour-saving or ‘relieving’ value which an offering represents for the acquirers, who do not have to carry out the activities ‘crystallised’ in the
acquisition (e.g., do not have to build our own car), and (b) the ‘enabling’ value which the offering represents for the acquirers, which equals the enhanced ease, productivity, safety, elegance, and/or effectiveness in their own value-creating action and interaction that utilising it brings to them (e.g., we can drive our acquired car from A to B, which is easier than walking). (Ramirez 1999).

According to Prahalad & Ramaswamy (2004a), in co-creation, direct interactions with consumers and consumer communities are critical. Consumer shifts are best understood by being there, co-creating with them. Co-creation of value happens through compelling co-creation experiences, as well as the extraction of economic value. Firms must learn as much as possible about the customer through rich dialogue that evolves with the sophistication of consumers. Interactions occur repeatedly, anywhere and at any time within the system, instead of once at the end of the value chain. The market moves from an independent target to a more integrated forum. The market has to be seen as a space for potential co-creation experiences in which individual constraints and choices define the willingness to pay for experiences. In short, the market resembles a forum for co-creation experiences.

The value co-creation process involves the supplier creating superior value propositions, with customers determining value when a good or service is consumed. Superior value propositions, that are relevant to the supplier’s target customers, should result in greater opportunities for co-creation and result in benefits (or value) being received by the supplier by way of revenues, profits, referrals, etc. Traditionally, suppliers produced goods and services, and customers purchased goods and services. Today, customers can engage in dialog with suppliers during each stage of product design and product delivery. Together, supplier and customer have the opportunity to create value through customised, co-produced offerings. (Payne et al. 2008). Customers become a part of the process in its early phases, and have influences on it.

Co-creation of value fundamentally challenges the traditional distinction between supply and demand. When the experience, along with the value inherent in it, is co-created, the firm may still produce a physical product. But the focus shifts to the characteristics of the total experience environment. Demand then becomes contextual. Given that customers cannot predict their experiences, co-creation of value may well imply the death of traditional forecasting. Instead, the focus shifts to capacity planning, the ability of the experience network to scale up and down rapidly, and for the system to reconfigure resources in real time to
accommodate shifting consumer desires and personalisation of co-creation experiences. (Prahalad & Ramaswamy 2004a).

Businesses operate in a networked environment in which it is possible both to learn continuously about what people want and need, and to interact with them in ongoing exchanges of value. But companies need to be much more aware of where these opportunities to interact with consumers exist. (Prahalad & Ramaswamy 2002).

Prahalad & Ramaswamy (2002) suggest there are four building blocks for co-creating value. Dialogue at every stage of the value chain encourages not just knowledge sharing, but, even more importantly, understanding between companies and customers. It also gives consumers more opportunity to interject their view of value into the creation process. In short, access challenges the notion that ownership is the only way for the consumer to experience value. By focusing on access to value at multiple points of exchange, as opposed to simply ownership of products, companies can broaden their view of the business opportunities creating good experiences. Risk reduction assumes that if consumers become co-creators of value with companies, they will demand more information about potential risks of goods and services; but they may also have to bear more responsibility for handling those risks. Transparency of information is required to create the trust between institutions and individuals. (Prahalad & Ramaswamy 2002).

According to Payne et al. (2008) the literature, their own initial research and later field-based research confirmed the need for a practical and robust process-based value co-creation framework consisting of three main components:

- Customer value-creating processes—in a business-to-consumer relationship, the processes, resources and practices which customers use to manage their activities. In a business-to-business relationship, the processes are ones, which the customer organisation uses to manage its business and its relationships with suppliers.
- Supplier value-creating processes—the processes, resources and practices which the supplier uses to manage its business and its relationships with customer and other relevant stakeholders.
- Encounter processes—the processes and practices of interaction and exchange that take place within customer and supplier relationships and which need to be managed in order to develop successful co-creation opportunities.
The arrows between the customer processes and customer learning indicate that the customer engages in a learning process based on the experience that the customer has during the relationship. This customer learning, in turn, has an impact on how the customer will engage in future value co-creation activities with the supplier. Similarly, the arrows between supplier processes and organisational learning indicate that as the supplier learns more about the customer, more opportunities become available for the supplier to further improve the design of the relationship experience and enhance co-creation with customers. (Payne et al. 2008)

Based on this co-creation aspect, the supplier and customer have to work together for their mutual benefit. The customer’s role should be a more active one; becoming a co-creator rather than waiting and using the products. Relationships are described as a set of interactions and transactions focused on a series of co-creation experiences. The locus of interaction is repeated, and can occur anywhere and at anytime in the system. In this study, the customer’s active role becomes clearer when the software product development and customer’s involvement in the process are explained. Next we identify who creates the value.

2.2.3 Who creates value?

In its early days, suppliers had to create value for customers. This is based on the simple idea that suppliers make products and customers use them and destroy the value. In industrial value creation, customers were seen as destroying the value that producers had created for them. Accounting systems emerging at that time thus ‘wrote down’ the value of what was acquired to zero over a shorter or longer ‘depreciation’ period. The end user in this scheme equals the ‘final’ customer. For producers, industrial value was ‘realised’ in the transaction, which joined and separated them from customers. (Porter 1985). From this point of view, value is seen as being something concrete and tightly connected to the product. When the product is used, the value is used.

According to Ramirez (1999), one of the main differences between the alternative school of value co-production and the industrial school of value creation concerns the role of the customer. In the industrial view, customers destroy the value created by producers; in the value school, customers create value, or more exactly, co-create and even co-invent it both with their suppliers and their own customers. What is the result of the changing role of consumers? Companies can no longer act autonomously, designing products, designing
production processes, crafting marketing messages, and controlling sales channels with little or no interference from consumers. Consumers now seek to exercise their influence in every part of the business system. Armed with new tools and dissatisfied with the available choices, consumers want to interact with firms and thereby co-create value. The use of interaction as a basis for co-creation is at the crux of the emerging reality (Prahalad & Ramaswamy 2004a), not only between consumers and companies, but also between larger networks.

The future of competition, however, lies in an altogether new approach to value creation, one that is based on the individual-centred co-creation of value between consumers and companies. Armed with new connective tools, consumers want to interact and co-create value, not just with one firm but with whole communities of professionals, service providers, and other consumers. The co-creation experience depends on individuals. Each person’s uniqueness affects the co-creation process as well as the co-creation experience. A firm cannot create anything of value without the engagement of individuals. Co-creation supplants the exchange process. (Prahalad & Ramaswamy 2004a). When individuals are engaged, there is some kind of relationship to explain the engagement.

According to Naumann (1995), relationships with customers and suppliers alike have become more important. Designing good customer information systems that allow data mining will help in the design and delivery of a value proposition. Increased outsourcing has resulted in firms being more reliant on suppliers. Firms need to form partnerships and alliances with key suppliers so that value-creating processes can be coordinated and harmonised. The ultimate success of a business is dependent upon the ability to align both internal and external processes to deliver good value to the customer. Coordination demands good planning and focusing both internal and external processes on the same goal.

Further, understanding value mandates that a firm capture the voice of the customer. A customer satisfaction programme is an important part of this effort; providing the customers’ evaluation of a firm’s performance. The customer is truly the ultimate judge of quality. But a customer satisfaction programme alone is often insufficient. Relationships have to be proactively developed with key customers in order to learn their future needs and where they will be in one or two years. Since few organisations are perfect, customer complaint handling systems have to be developed to transform disgruntled customers into satisfied, loyal customers. For those cases when a firm loses a customer, it has to be able to pinpoint exactly why the customer departed and use the situation as a learning
experience. (Naumann 1995). Negative experiences have to be reviewed and the reasons clarified, before it is possible to learn from them.

According to the value-in-use concept customers create value for themselves, when using resources provided by a supplier. The customer is the main and only value creator (of value-in-use) and does much of the value creation as sole value creator with resources acquired, without interactions with the supplier. Basically, the role of the supplier is to facilitate this process by providing value-supporting resources for the customer’s use (Grönroos 2008). During value facilitation no value (as value-in-use) is created. However, interactions of a variety of kinds (negotiations, planning, advice, repair, maintenance, etc.) between the two parties occur and may be extensive. In such situations, the supplier’s and customer’s processes proceed simultaneously and interactions occur. During such interactions the supplier can get opportunities to directly and actively influence its customer’s value-creating process, both the flow of the process and its outcome. (Grönroos & Helle 2010).

Customers increasingly are being encouraged to take on more active roles in producing goods and services. Furthermore, perceived expertise may affect the customer’s psychological responses to co-production. A customer who believes he or she has the expertise and chooses to co-produce may be more likely to make self-attributions for success and failure than a customer who lacks the expertise. A customer who lacks the expertise but feels forced to co-produce (e.g. a customer who enters a department store seeking help from store personnel but is forced to make decisions on his or her own because of the scarcity of store personnel) may make more negative attributions about co-production. (Bendapudi & Leone 2003).

Interactions provide value co-creation opportunities for the supplier, because the supplier’s and its customer’s processes do not run in parallel only, but merge into one interactive process. The customer takes actions as co-producer inside the supplier’s practice or process, and simultaneously the supplier takes actions inside the customer’s corresponding process, and hence, is also directly engaged in the customer’s value-creating process, and can perform actively as part of that process. This is the only way a supplier can be a value creator, and then in the form of co-creator only. (Grönroos & Helle 2010).

Production of resources (e.g. goods, service activities, information) is not value creation; it is part of value facilitation. During interactions customers get engaged in the supplier’s productions processes, such as the production of goods and service activities and become co-producers. (Grönroos & Helle 2010). According to Gummesson & Mele (2010) service-dominant logic dissolves many
of the differences of the dichotomies from the midrange theories and elevates the concepts to a higher level of abstraction. Services versus goods become service, a term that includes all components that constitute service and value. Offered in the market it is labelled value proposition. The customer-supplier roles have been redefined and their commonality is that both are operant resources that co-create value. Value-in-exchange and value-in-use become components of value-in-context.

The customer and supplier or buyer and seller are basic roles, which are changing to become more like co-creators of value. To be more active, a customer has to take part in the process rather than waiting. The supplier cannot develop products quietly, because customer’s opinion has to be taken into consideration. This demands communication and interaction and the key is recognising how a customer driven supplier should behave in order to create a successful business. The customer is the ultimate judge and this power can’t be ignored. In co-operation, the information flow from customers is more point-of-time and is more focused than information collected from the general market.

2.2.4 Towards service-dominant logic

Service science is the study of service systems, which are dynamic value co-creation configurations of resources (people, technology, organisations, and shared information). These four categories of resources are significant because they include resources with rights (people and organisations), resources as property (technology and shared information), physical entities (people and technology), and socially constructed entities (organisations and shared information). (Maglio & Spohrer 2008). Specifically, Maglio et al. (2009) suggest that there is an emerging revolution in business and economic thinking for the twenty-first century based on a new worldview, service-dominant logic (S-D logic), and on a new basic abstraction, service system. A key behaviour is that service systems interact to co-create value. For example, viewed as service systems, a package delivery company transports objects from other companies or individuals; value is co-created in that results depend on both transportation contributed by the delivery service and objects and locations contributed by the clients. (Maglio et al. 2009).

Lusch & Vargo (2006) believe that it is important to recognise that there are two components of value co-creation. The most encompassing of these is the co-creation of value. This concept represents a rather drastic departure from goods-
dominant logic, which views value as something that is added to products in the production process and at point of exchange is captured in value-in-exchange (i.e. price). Service-dominant logic, however, argues that value can only be created with and determined by the user in the consumption process and through use or what is referred to as value-in-use. Thus, it occurs at the intersection of the offerer and the customer over time: either in a direct interaction or mediated by a good, as indicated in FP3 (goods are distribution mechanisms for service provision).

The second component of co-creation is what might more correctly be called co-production. It involves the participation in the creation of the core offering itself. It can occur through shared inventiveness, co-design, or shared production of related goods, and can occur with customers and any other partners in the value network. (Lusch & Vargo 2006). Because both ‘co-creation of value’ and ‘co-production’ make the consumer endogenous, they are both different from the production concepts associated with goods-dominant logic. Clearly, they are also nested concepts with the former super-ordinate to the latter in the same way, and with similar implications, as the relationship between service and goods in service-dominant logic. (Lusch & Vargo 2006).

Service-dominant logic suggests the following transitional shifts to move from a product focus to a service focus.

- From thinking about the purpose of firm activity as making something (goods or services) to a process of assisting customers in their own value-creation processes
- From thinking about value as something produced and sold to thinking about value as something co-created with the customer and other value-creation partners
- From thinking of customers as isolated entities to understanding them in the context of their own networks
- From thinking of firm resources primarily as operand — tangible resources such as natural resources — to operant — usually intangible resources such as knowledge and skills
- From thinking of customers as targets to thinking of customers as resources
- From making efficiency primary to increasing efficiency through effectiveness. (Vargo & Lusch 2008).

Collectively, these shifts imply much more than just a move from goods to services. They imply a reframing of the whole purpose of the enterprise and its collaborative role in value creation, for both the actors involved in exchange and
for society. (Vargo & Lusch 2008). Although S-D logic and service systems focus on value derived and determined through use or context, value determined by exchange remains an important component in the co-creation of value. Co-creation of value inherently requires participation of more than one service system, and it is through integration and application of resources made available through exchange that value is created. The process of co-creating value is driven by value-in-use, but mediated and monitored by value-in-exchange. (Vargo et al. 2008).

The S-D logic of marketing seems to be largely about the marketer’s role in helping customers to create valuable experiences at all stages of the ‘consumption’ process including planning, selection, purchase, consumption, and disposal. The key concept is servicing an experience. As customers become dissatisfied with current products and services, sometimes due to poor performance but at other times due to changes in what they value, simple variety seeking, changes in attitudes, or changes in use situations, they seek out alternatives. This dynamic, maybe product-transient, nature of the customer is simply the natural complexity of customers as phenomena. (Flint 2006).

Zhang & Chen (2008) bring together the key constructs of a co-creation system and presents a collective logic of interacting mechanism among the constructs. It is governed by two primary principles. The first principle relates to the integration of customers for value co-creation through interactive co-creation activities. The second principle relates to the relationship between the co-creation activities and new system capabilities. The emphasis of co-creation with customers may not only positively impact on service capability, but also directly impact on customerisation capability, which significantly differs from the traditional capabilities. This means the focus on the co-creation with customers may gain new competence, thus obtaining more competitive advantages.

Assisting firms to manage the industrial service part of their business better may, of course, help them create a new earnings logic for their service activities and generate new and more effective ways of finding growth and revenue-generation opportunities. However, only developing the logic for managing the entire business from a service perspective as an integrated business, including the traditional manufacturing and the service activities parts, makes it possible for the firm to make such a quantum leap. (Grönroos & Helle 2010).

Service-dominant logic also recognises that customers as well as suppliers are resource integrators, consistent with the concept of co-creation of value. Service-dominant logic not only brings the customer into the process of co-creation of
value, but organisation's partners throughout the value network as well. Consequently, service-dominant logic recognises that each entity should collaborate with other entities and integrate resources with them. (Cova & Salle 2008). According to Rouvinen (2010) value and business model concepts are seen as the fundamentals of business management and tools for opportunity identification. Service business literature offers new business perspectives to value co-creation with customers.

Depending on whether a firm adopts a service logic or not, its role in the value-creating process varies. Suppliers have to provide customers with the necessary resources for their value-generating processes. Suppliers can be said to facilitate customer value creation by providing the value foundation required. Hence, basically the supplier’s role is to facilitate value creation, and consequently they take part in the value-creating process as value facilitators. Further, adopting a service logic and creating interactions with customers provide the supplier with an extended role in value creation. Instead of being restricted to acting as a value facilitator only, the firm can actively take a role in the customers’ value-generating processes and directly influence them. The supplier becomes a co-creator of value with its customers. (Grönroos 2008).

The goods versus services debate was about the supposed differences between goods and services; S-D logic considers the relationship between service and a good – that is, a good is an appliance used in service provision. In S-D logic service is the common denominator of exchange and thus is hypernymic to goods. There is no good-versus-service winner or loser in S-D logic. (Lusch and Vargo 2006).

2.2.5 How to assess and measure value

The literature review suggested that value is a multi-dimensional construct. These dimensions can be described as “benefits” or “sacrifices”. Therefore, the measurement technique must identify these benefits and sacrifices. The criteria were grouped into “quality-related” aspects as an expression of the perceived benefits and the “price-related” aspects representing the perceived sacrifices. Most of the definitions of value in the marketing literature stress that value is created as a trade-off between quality and price. Extensive research has been conducted to study whether quality and price may or may not be positively related. The results of both experimental studies and studies based on secondary market data are equivocal: some studies show a positive correlation, whereas others show
an inverse relationship or no relationship at all. In their study, customers could easily obtain information about the quality characteristics of the products through product documentation and testing. They therefore adopted an approach based on a positive correlation between quality and price. Researchers have suggested that value perceptions depend on specific-use situations. (Woodruff & Gardial 1996).

Different customer segments perceive different values within the same product. Hence, Woodruff & Gardial’s study needed to identify distinct customer segments and probe for differences across segments regarding (1) the types of criteria needed to assess customer perceptions, (2) the relative importance of each criterion, and (3) the competitors to be compared. The literature review suggested that the business-to-business purchasing process typically involves different members of a buying organisation. As a consequence, the approach had to ensure that we captured the value perceptions of the key informants involved in the purchasing process. Their measurement technique had to compare performance measurements across competitors. This is one of the central aspects that distinguish customer value measurement from customer satisfaction measurement (Gale 1997, Ulaga & Chacour 2001).

Ulaga & Chacour (2001) summarise the key elements addressed in the customer value measurement process:

- Identification of benefits and sacrifices;
- Value creation as a trade-off between quality and price;
- Distinction between customer segments and use situations;
- Preference for a multiple-informant approach;
- Comparison with alternative supplier offerings.

Value measurement is based on the idea that a customer can recognise the benefits and sacrifices in every product or service. The customer is seen as a subjective actor, who is capable of objectively comparing different offerings and selecting the best alternative. The value can be seen as trade-off between quality and price. The quality of a product is one main benefit, and it has an important role in software product development, as explained in more detail later in this study. The customer’s role as value creator is increasing. Customer-perceived value is described more detail in the next section.
2.3 Concept of customer-perceived value

This section is focused on customer-perceived value. Theoretically, customer-perceived value is closely linked to theories of *customer satisfaction, customer loyalty, and competitive advantage* as a consequence of increased value. This chapter concentrates on different views and what they offer to the value concept.

Values, whether personal or organisational, are very closely related to the goals customers have. The desired end-states for individuals (e.g., honesty, sense of accomplishment) or organisations (e.g., make a profit, provide employment, continuous innovation) can be viewed as higher order goals. Values are defined as being centrally held and enduring core beliefs, desired end-states, or higher order goals of the individual customer or customer organisation that serve to guide behaviour. (Flint *et al.* 1997).

Ulaga & Chacour (2001) state that customer-perceived value is often used in relation to two other constructs: ‘customer-perceived quality’ and ‘customer satisfaction’. They define customer-perceived value in industrial markets as the trade-off between the multiple benefits and sacrifices of a supplier’s offering as perceived by key decision makers in the customer’s organisation and taking into consideration the available alternative suppliers’ offerings in a specific-use situation.

Recently, customer value has been defined and a psychometrically sound scale for measuring the concept in business-to-business markets has been developed (Eggert & Ulaga 2002). Four customer-value components emerged from their study: *product-related benefits, strategic benefits, personal benefits, and relationship sacrifices*. These were aggregated into the higher-order construct of customer value. As has been stressed earlier, the literature contains a variety of definitions of customer-perceived value. In these definitions, Eggert & Ulaga (2002) identified three common elements:

1. Multiple components of value: customer-perceived value is presented as a trade-off between the benefits and sacrifices perceived by the customer in a supplier’s offering;
2. The impact of roles and perception: customers are not homogeneous and, therefore, different customer segments perceive different values within the same product.
3. The importance of competition: value is relative to competition. Offering better value than the competition will help a company to create sustainable
competitive advantage. Customer value measurement is a strategic marketing tool used to clarify a company’s proposition to its customers, thus creating a differential superior offering compared with the competition.

Customer value is a customer’s perceived preference for and evaluation of *product attributes, attribute performances, and the consequences arising from use* that facilitate (or block) achieving the customer’s goals and purposes in use situations (Woodruff 1997). Customer value is the customer’s perception of what they want to happen (i.e. the consequences) in a specific use situation, with the help of a product or service offering in order to accomplish a desired purpose or goal. This definition helps one understand that products or services are a means to accomplishing customer goals. (Stahl *et al.* 1999). Key variables in the customer's mind influence the perceived value of service and the quality of the service. These numerous variables collectively influence: *The perceived quality of service delivery, expectations about characteristics of service; ex ante perceptions of need, or desire for service.* (Groth & Dye 1999). Value is related to some specific offering (technical value dimension), is created in a wanted way (functional value dimension), and is perceived as relevant in a specific time (temporal value dimension) and location (spatial value dimension) (Heinonen 2004). In Table 1 is presented benefits and sacrifices in customer value.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs or sacrifices</th>
<th>Researcher(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximise rewards</td>
<td>Minimise costs</td>
<td>Bagozzi 1974</td>
</tr>
<tr>
<td>What is received</td>
<td>What is given</td>
<td>Zeithaml 1988</td>
</tr>
<tr>
<td>Quality and benefits</td>
<td>Relative to sacrifices</td>
<td>Monroe 1991</td>
</tr>
<tr>
<td>functional, social, emotional, epistemic, and conditional value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worth of a set of economic, technical, service, and social benefits</td>
<td>Exchanged for price of product</td>
<td>Anderson, Jain and Chintagunta 1993</td>
</tr>
<tr>
<td>Product value, value-in-use, possession value, and overall value</td>
<td></td>
<td>Burns 1993</td>
</tr>
<tr>
<td>Perceived quality</td>
<td>Relative prices</td>
<td>Gale 1994</td>
</tr>
<tr>
<td>More than quality</td>
<td>More than price</td>
<td>Holbrook 1994</td>
</tr>
<tr>
<td>Emotional bond between customer and producer</td>
<td></td>
<td>Butz and Goodstein 1996</td>
</tr>
</tbody>
</table>

Table 1. Benefits and sacrifices in customer value.
The definitions have similarities and differences. Consensus is seen in the linking of customer value to some product and/or service. Further, at the core of customer value is the perspective of the customer and not that of the seller. Finally, the perception of customer value involves a trade-off between what the customer receives (e.g., quality, benefits, worth, utilities) and what they give up (prices, sacrifices) to acquire the product. Divergence is seen in the reliance on other terms—utility, worth, benefits, and quality—to construct the definitions, but these terms are not all well developed or defined. Hence, it becomes difficult to compare concepts: Is customer value as quality the same as customer value as utility? (Spiteri & Dion 2004). It is easier to define sacrifices, which quite often are related to simple price. More complex is defining costs, because they can include costs other than the price of a product or service. For example, Butz & Goodstein (1996) define customer value as the emotional bond established between a customer and a producer after the customer has used a salient product or service produced by that supplier and found the product to provide an added value.

### 2.3.1 Basic elements of customer-perceived value

In the next sections, the focus is on finding out which elements determine customer value. Detailed consideration is also given to which elements influence customer value. This aspect is also important for the supplier, because it provides the tools to work with, and perhaps even ways in which to manipulate customer value. Several authors have addressed the multifaceted nature of benefits and sacrifices as elements of value (for a review, see Ulaga 2003). As a result, various types of categorisations of value criteria (Lapierre 1997), value functions (Walter et al. 2001), value drivers (Ulaga 2003), and aspects of value (Anderson & Narus 1999), have been proposed.

Naumann (1995) in his book: Creating customer value and Customer satisfaction measurement and management, defines the components of customer value in the shape of simple model, which uses product quality, service quality, price and image. Once a customer has made a purchase decision, a fifth component of value emerges. That component is the relationship between the customer and the vendor. Over time the relationship component can develop into an extremely important element. Unfortunately, firms often have explicit strategies to develop the other four components of value but simply expect the relationship to happen naturally and spontaneously. Such an expectation can be
unrealistic. Further, each of these components can and should be broken down into much more detail for them to be managerially useful. The categories of product, service, price, image, and relationship will shape the customers’ perceptions of value in any business. What make for change are the specific attributes within each category. The components of service would be quite different for a department store versus an auto repair shop. Managers are often surprised at the number of different attributes that customers use to evaluate a firm’s value proposition. (Naumann 1995). For example Woodal (2003) implies the factors that are likely to exert influence over the valuation process. According to Woodal (2003), customer factors include demographics, personal circumstances, personal value systems, and experience. Consumption factors include situation, stage within the consumption cycle, and the rate/extent of the release of intrinsic qualities. Product factors include perceived risk and recognised product attributes. Market factors entail availability, competition, and perceived equity.

Customer value dimensions

According to Kothandaraman & Wilson (2001), the total market offering of the firm encompasses the technology that supports the product or service, the benefits of the product, the company’s reputation, and the benefits delivered by people representing the organisation. The customer weighs up the complex bundle of benefits or market offering relative to competitive market offerings, with relative price being the item that relates the two market offerings. Value is the relationship between a firm’s market offering and the price charged, as evaluated by the consumer against the market offering and price charged by competitors. For a customer to perceive value, it is necessary to make a choice between the available market offerings in the context of price. Value is also assessed within the context of a market segment. What follows must be taken within the context of price and the market segments. Anderson et al. (1993) defined value as:

“The perceived worth in monetary units of the set of economic, technical, service, and social benefits received by the customer firm in exchange for the price paid for a product offering, taking into consideration the available suppliers’ offerings and prices.”

Lapierre (2000) identified the IT sector as one in which products and services do not adequately define the range of resources and activities that appear to create
customer value. She defines the content validity of the proposed customer value dimensions (benefit and sacrifice) and concludes that they may be justified by comparing them with models proposed in the literature. Total value proposition has special meaning when customers evaluate the offering and consider how well it fulfils their needs. Every offering consists of several aspects, all of which influence the evaluation outcome. A customer’s selection can be based on a better product, service, or relationship, or on different combination of these.

According to Lapierre (2000), product-related benefits include alternative solutions, product quality, and product customisation and the sacrifice is price. Service-related benefits are responsiveness, flexibility, reliability, and technical competence and again, the sacrifice is price. Relationship-related benefits are image, trust, and solidarity. Relationship-related sacrifices are time, effort, energy, and conflict. All of these areas form the total value proposition.

More specifically, Lapierre’s (2000) study reveals that a value proposition associated with IT solutions is about more than just a product, service, or relationship. The findings suggest that IT solutions consist of product, service, and relationship at many different levels (Ravald & Grönroos 1996, Bolton & Drew 1991, Zeithaml 1988). The most striking result is that price, a value driver that is both product and service related, is not significant when it is associated with service and its significance varies when it is associated with product.

The relational aspect as a constituent of the offering is not taken into account. The value of having a relationship, e.g. the value of commitment from both parties, in our opinion also needs to be taken into account when analysing the offering provided and the manner in which it influences the customer’s perception of the value. A suggestion is that the relationship itself might have a major effect on the total value perceived. In a close relationship, the customer probably shifts the focus from evaluating separate offerings to evaluating the relationship as a whole. The core of the business, i.e. what the company is producing, is of course fundamental, but it may not be the ultimate reason for purchasing from a given supplier. The reason for purchasing may be simply because the customer has a relationship with this supplier and even though the offering is not exactly the one sought, the parties involved try to come to an agreement where the objectives of both parties can be met. In this situation the central point of discussion is changed. The issue is not what kind of offering the company provides – rather it is what kind of relationship the company is capable of maintaining. (Ravald & Grönroos 1996).
It is quite impossible to buy a product without any kind of service or relationship. Especially, service has become more significant, even decisive when customers select what to buy, at least for the first time. Later, the significance of the relationship becomes more obvious. The basic value offering consists, at least, of product-related, service-related and relationship-related benefits and sacrifices, which can be monetary or non-monetary in nature. In the real world, the customer has to select a suitable combination of benefits and sacrifices based on their knowledge at that moment. For example, the entire gamut of sacrifices may be difficult to know beforehand, and that creates uncertainty.

**Forms of value**

Woodruff & Gardial (1996) define customer value as:

"The customer perception of what they want to happen (i.e., consequences) in a specific kind of use situation, with the help of a product or service offering, in order to accomplish a desired purpose or goal."

This definition implies that the value is created by products and services when the benefits they deliver (i.e., positive consequences) help customers achieve their goals in various situations. Desired value can take on two aspects; value in use or value in possession. Value in use reflects the use of the product or service in a situation to achieve a certain goal or set of goals. Value in possession reflects the inherent meaning of the product or service to the customer. Desired value changes are changes that the customer wants to happen. Basically, value judgements reflect an assessment of the value that has been received from a specific product/service supplier. Value judgements are dependent on customers’ perceptions of product and service performance within specific use situations in light of their values and goals.

Woodruff & Gardial (1996) state that: 1) products are a means to accomplishing a goal (achieving value in use or possession value), 2) value is created through the delivery or consequences, and 3) consequences occur in use situations. Their model draws a distinction between customer beliefs, what the customer wants to happen, and what has happened. The customer has expectations and is capable of evaluating how well these expectations have been fulfilled. Interestingly, this view makes customers goal-oriented, as they take into account the use situation and a clear time frame both before and after use.
2.3.2 Customer value creation

In this section, the focus is on identification of the phases that build customer value. How is it possible to move from desired value to expected value and finally to received value? Exchange plays a decisive role because it changes the ownership from supplier to buyer. From a buyer’s perspective it is more interesting to find out what happens when the product is in-use, because it solves the issue of how satisfied the customer is. Theoretically, this is like searching for the right pieces to a puzzle, since there is no right kind of model or picture that answers all of these questions. The models used are difficult to compare and connect, but they do offer little pieces of the puzzle.

Customer value hierarchy model

Woodruff’s (1997) customer value hierarchy suggests that customers conceive desired value in a means-end way. Means-end models are based on the assumption that customers acquire and use products to accomplish favourable ends. This view is prevalent in consumer behaviour literature in particular, where value is defined in terms of personal values, mental images, or cognitive representations underlying customers’ needs and goals (Wilkie 1994, de Chernatony et al. 2000).

Starting at the bottom of the hierarchy, customers learn to think about products as bundles of specific attributes and attribute performances. The next level of the hierarchy focuses on purchasing and using a product, when customers form desires or preferences for attributes based on their ability to facilitate the achievement of the desired consequence experiences that are reflected in value in use and possession. Customers also learn to desire certain consequences according to their ability to help them achieve their goal and purposes (i.e. the highest level). (Woodruff 1997). Customers learn to desire certain levels and evaluate products based on earlier experiences.

Either prior to purchase or constructed at the time of use (Oliver 1997), customers may imagine what value they want (i.e., desired value). Customers learn to think concretely about value in the form of preferred attributes, attribute performances, and the consequences of using a product in a use situation. In addition, they form opinions or feelings about the actual value experience of using a product (i.e., received value). During the choice task, customers may predict received value, but they actually experience received value during use.
Operationally, value frequently is measured as attribute-based desires (or preferences) that influence a purchase. This is transactions based view and is concentrated on the purchase. (Woodruff 1997).

Looking down the hierarchy, customers use goals and purposes to attach importance to consequences (Clemons and Woodruff 1992). Similarly, important consequences guide customers when importance is attached to attributes and attribute performance. The customer value hierarchy describes received value equally well. Customers evaluate products using the same desired attribute, consequence, and goal structure that they have in mind at that time (Gardial et al. 1994, Zeithaml 1988). Further, the customer use situation plays a critical role in evaluation as well as in desires. If the use situation changes, the linkages between product attributes, consequences, and goals and purposes also change. For example, a customer’s value hierarchy for Internet services used at work may look quite different than the value hierarchy for those services used at home for entertainment. (Woodruff 1997).

Value exchange model

Looking into value from the exchange point of view, a model is built based on Huber et al. (2001), Parolini (1999), Grönroos (1997), Groth (1994), and Zeithaml (1988) among others. The value exchange model is basically a give-and-take model or a benefits-costs model. The customer is willing to sacrifice a certain amount of time, effort, and money, and to take certain risks in exchange for the expected benefits that outweigh the total sacrifices. This difference between total benefits and total sacrifices results in net customer value and leads to a purchasing decision only if it is zero or above. The total benefits consist of utility value and psychical value. The total customer sacrifice, or the total customer cost, consists of financial and non-financial customer costs, i.e. the total customer ownership cost (pre-use, at-use, and post-use costs). The importance of this model is that it incorporates a number of components that are usually discussed separately, such as: total customer ownership costs, net customer value, utility value, and psychic value. (Khalifa 2004).

The importance of the value exchange model comes from incorporating a number of components that are usually discussed separately in the literature. It is basically a benefits-costs model. The total benefits, or the total customer value, consist of utility value and psychic value, while the total customer sacrifices
consist of financial and non-financial customer costs; i.e. the total customer ownership cost (pre-use, at-use, and post-use costs). (Khalifa 2004).

The value exchange model depicts both kinds of supplier/buyer relationships: the end result of the transaction-based relationships (selling) and the beginning or continuation of interaction-based relationships (interactive generation of value). The model summarises all of the business activities that create value up to the point of exchange. To be able to offer customers superior value for exchange, a firm should understand how to generate and accumulate value for customers, what forms customer value may take, and what factors influence the accumulation of value. Hence, the value build-up model is needed to help bring about that understanding.

**Customer value build-up model**

Focusing on the benefits side of the value equation and implicitly assuming that total customer benefits exceed total customer costs, gives rise to the customer value build-up model. This model is an integration and extension of the work of McKean (2002), Smith & Wheeler (2002), Horovitz (2000), Schneider & Bowen (1999), Groth (1994), and Lovelock (1983) among others. The total customer value is influenced by four factors. The first two factors are concerned with whether the customer is treated merely as a consumer or respectfully as a person and whether the relationship with the customer is looked at by both parties (supplier and customer) as a simple transaction or as a genuine interaction that considers the intensity and longevity of the relationship between the supplier and the customer. These two factors are very closely related to the remaining two factors: the customer needs that the supplier intends to satisfy and the corresponding customer benefits he/she intends to offer. Customer needs range from pure utility needs to pure psychic needs or any combination of the two. The corresponding customer benefits range from the pure tangible or tangible dominated to the pure intangible or intangible dominated benefits.

A customer’s value builds up as he/she feels treated more as a person than as a consumer, i.e. whether the supplier satisfies only the utility needs of the customer or, in addition to that, satisfies also his/her psychic needs. The customer uses a rich set of valuation criteria, which can be either objective or subjective or a combination of both. This depends mainly on the perceived type of relationship with the supplier (a mere transaction or a genuine interaction), the type of needs he/she intends to satisfy (utility or psychic), and the way he/she is treated by the
supplier (as a consumer or as a person). For example, a customer who stops by a gas station to fill his car’s fuel tank intends mainly to satisfy a utility need. The relationship between the supplier and the customer is no more than a transaction. The supplier, most likely, considers the customer to be a consumer and deals with him as such. The benefits are mainly tangible and the customer evaluates the service mainly on that basis. Compare this situation with a student who wants to choose a university for his/her graduate studies. What is important for the student in this case is not just the degree programme, which is the core product of the university. The student most likely also considers, among other things, the image of the university and its professors, and his/her expected or desired experience when he/she enrols in the programme, including in-class, off-class, extracurricular, and other services provided by the university. The relationship between the university and the student is definitely not transaction-based, rather it is long-term, intensive, and interactive. The student would like to be treated more as a person and not just as the consumer of a service. The student’s needs go beyond the graduate degree to include psychic needs like feelings of pride, achievement, and superiority. (Khalifa 2004).

The customer value accumulates as the satisfied needs advance from utility to psychic, as the customer benefits offered transcend tangibles to intangibles, as the nature of the relationship between the customer and the supplier develops from transaction to interaction, and as the customer treatment shifts from being a consumer to being a person. This accumulation of value may take one of four distinct forms that can be arranged from low to high as follows: functionality; solution; experience; and meaning. The first three forms are well articulated in the literature (for example, Horovitz 2000).

- **Functionality** means an outcome that the customer obtains from basic (and facilitating) product features.
- **Solution** is obtained by extending the offering to include support features that cover some of the activities the customer usually performs to, for example, acquire, install, use, and maintain the product.
- **Experience** involves adding intangibles to the tangible offering of the firm. The customer becomes part of the transformation process rather than a mere recipient of its end result. Experience takes into account the rational expectations of the customer concerning the functional attributes of a product or service but also more importantly, the emotional elements derived by the total experience (Smith & Wheeler 2002). McKean (2002) reports that
research reveals that up to 70 percent of a customer’s decision to buy is based on interactions and only 30 percent is based on product attributes.

- Meaning magnifies the value of the experience. It links the immediateness of the experience to the durability of a strongly held personal philosophy. It takes the experience to new heights of self-actualisation. The difference between experience and meaning is that the former can be understood as “living through” something; while the latter can be thought of as “living for” some purpose.

The value build-up model is a detailed picture of the gross or total customer value. The customer value is affected by four major factors arranged as continuums as described above. Customer value accumulates through four distinct forms: functionality, solution, experience, and meaning. This upward accumulation of value may fade if the supplier violates certain core needs of customers. (Khalifa 2004).

A longitudinal perspective on value

Woodal (2003) summarises value creation theories in his article: Conceptualising value for customers: an attributional, structural and dispositional analysis. Amongst the 90 sources of literature explored many such properties, or sub-forms of value creation, were suggested. These fell broadly into one of two categories; there were those that described the nature of value creation in its derived form, and those that attempted to identify how, when, or under what circumstances value creation might be experienced (collectively termed contingent value creation).

Nature of delivered value creation: This relates to one specific primary form, derived value creation, and emanates primarily from two sources. In both cases, authors had developed taxonomies that represent the full range and variety of their particular vision of this specific value creation form. Holbrook (1999) under the guise of consumer value proposes efficiency, play, excellence, aesthetic, status, ethical and spiritual value-types, whilst Sheth et al. (1991) suggest that functional, social, emotional, epistemic, and conditional value are appropriate derivatives of what they called consumption value. The contributions from De Ruyter et al. (1997), considers emotional, practical, and logical value and Richins (1994a) looks at how material and (1994b) possession value serve to reinforce the extensive and complex nature of derived value creation. Some rationalisation here
might well usefully contribute to greater understanding, but because of the differing perspectives of the authors concerned, this could prove both difficult and contentious. (Woodal 2003).

*Contingent value creation*: Desired value (Albrecht 1994a, Woodruff 1997) and expected value (Albrecht 1994, Huber *et al.* 1997) relates to an ex ante/pre-purchase position and implies that customers have preconceptions regarding value creation whenever they contemplate a purchase. Transaction value and acquisition value (Grewal *et al.* 1998, Parasuraman & Grewal 2000b) plus exchange value (Lapierre & Deneault 1997) imply a sense of value creation experienced at the point of trade in real-time, whilst delivered value (Walters 1999), received value (Woodruff 1997), use value (Lapierre & Deneault 1997, Woodruff & Gardial 1996, Parasuraman & Grewal 2000b), and ‘post-purchase/performance value (Patterson & Spreng 1997) are suggestive of an ex post condition. Finally, there is redemption value (Parasuraman & Grewal 2000b), or value after use/experience or at the point of disposal/sale. *Collectively, these imply that there are both temporal and, consequently, cumulative, aspects to value creation.* Figure 2, below, identifies four distinct temporal positions for the value creation construct, which are based on the above analysis. (Note: ex ante and ex post categorisations are derived from Huber, *et al.* 1997). (Woodal 2003).

![Fig. 2. Temporal and cumulative aspects of value (modified from Woodal 2003).](image)

This model describes the longitudinal perspective, which takes into account time and suggests that value has a dynamic nature. Value develops and may be developed, and it concretises expectations. The transaction phase divides the pre- and post-exchange phases and this is the point where ownership changes hands.
Quality-value-loyalty chain

Panasuraman & Grewal (2000a) have drawn on their own previous research, as well as relevant research reported as outlined above to synthesise key insights pertaining to the quality-value-loyalty chain and the role of technology in this chain. They see a strong connection between the service/product quality and customer loyalty. A product’s quality is easier to copy than its service quality, and that make the service quality a more important part of the chain.

According to Panasuraman & Grewal (2000a), service quality is a logical driver of perceived value. In instances where the core of what the seller offers to the buyer is a service (e.g., insurance, financial advice, consulting), there is no tangible product and, as such, product quality and service quality overlap. Even in instances where the buyer-seller exchange involves a physical product, a superior presale and post-sale service rendered by the seller can add to the benefits received (the ‘get’ component) and also reduce the buyer’s nonmonetary costs such as time, effort, and mental stress (the ‘give’ component). Parasuraman et al. (1988) and Parasuraman et al. (1991) identified five generic dimensions that customers use as criteria for judging service quality:

- Reliability: Ability to perform the promised service dependably and accurately;
- Responsiveness: Willingness to help customers and provide prompt service;
- Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence;
- Empathy: Caring, and the individualised attention the firm provides to its customers;
- Tangibles: Appearance of physical facilities, equipment, personnel, and communication materials.

Of the five service quality dimensions, reliability has generally surfaced as the most critical dimension, based on both direct measures of relative importance (Zeithaml et al. 1990) and the importance weights derived from regression analyses (Parasuraman et al. 1988, 1991). The perceived value component includes four different types of value that have been identified in the literature (e.g. Grewal et al. 1999, Woodruff 1997):

- Acquisition value; the benefits (relative to the monetary costs) buyers believe they are acquiring by purchasing a product/service;
- Transaction value; the pleasure of getting a good deal;
– In-use value; utility derived from using the product/service;
– Redemption value; residual benefit at the time of trade-in or end-of-life (for products) or termination (for services).

As implied by these definitions, perceived value is a dynamic construct in that the relative emphasis on each component may change over time. For instance, while acquisition and transaction value may dominate during and immediately following purchase, in-use and redemption value may become salient only during the later stages of product/service usage. The notion that perceived value is dynamic is also consistent with earlier work suggesting that the nature and determinants of value assessment may change during various stages of a customer’s association with a company (Parasuraman 1997, Slater & Narver 1994, Vantrappen 1992, and Woodruff 1997).

Customer satisfaction research is mainly influenced by the disconfirmation paradigm (Parasuraman et al. 1988). This paradigm states that the customer’s feeling of satisfaction is a result of a comparison process between perceived performance and one or more comparison standards, such as expectations. The customer is satisfied when he/she feels that the product’s performance is equal to what was expected (confirming). If the product’s performance exceeds expectations, the customer is very satisfied (positively disconfirming), if it remains below expectations, the customer will be dissatisfied (negatively disconfirming). Although most scholars agree on the disconfirmation paradigm, the nature of satisfaction remains ambiguous. On the one hand, satisfaction clearly arises from a cognitive process comparing perceived performance against some comparison standards. On the other hand, the feeling of satisfaction essentially represents an affective state of mind. Consequently, some satisfaction scales tap the cognitive dimension of satisfaction, while others capture its affective nature. The extent to which a satisfaction scale focuses on the cognitive or the affective dimension, however, should have an impact in terms of both the antecedents that affect satisfaction and the consequences fostered by satisfaction. (Eggert & Ulaga 2002).

According to Eggert & Ulaga (2002), most satisfaction models are rooted in the disconfirmation paradigm. Hence, satisfaction must be considered to be a post-purchase construct. Customer-perceived value, in turn, is independent of the timing of the use of a market offering (Woodruff & Gardial 1996), and can be considered as a pre- or post-purchase construct. Customer satisfaction measures how well a supplier is doing with his/her present market offering, as perceived by
existing customers. Such a tactical orientation provides guidelines of action for improving current products and services. The customer value construct, in turn, points at future directions. Its strategic orientation aims at assessing how value can be created for customers and by which means a supplier’s market offering can best meet customers’ requirements. As a consequence, the assessment of customer-perceived value is directed toward former, present, and potential clients, whereas satisfaction research is mainly geared toward the supplier’s current customer base. Finally, satisfaction research is predominantly oriented toward the assessment of the supplier’s market offering, but does not necessarily integrate information pertaining to competitor’s product offerings. Customer-perceived value measurement, on the other hand, explicitly benchmarks the supplier’s offering relative to the competition.

According to the mediated impact model, customer-perceived value leads to satisfaction, which, in turn, leads to positive behavioural intentions. The model has a significantly better fit than the rival model, which poses a direct relationship between customer-perceived value and behavioural outcomes. It can be concluded that satisfaction remains a strong predictor for behavioural outcomes. Customer-perceived value is a complement to and not a substitute for customer satisfaction. However, more research is required before a particular view concerning the homological relationship between customer-perceived value, customer satisfaction, and behavioural outcomes is to be accepted. (Eggert & Ulaga 2002).

**Customer value model**

The customer value model, presented in Figure 3, shows the business development process as it moves from vague idea to market offering, both from the company’s and the customer’s perspective. At the start of the business development process, the company may have only vague ideas about the value it intends to offer to its customers. This value depends on the company’s perceptions of what the customer wants and is based on its strategy, capabilities, and resources. (Day & Wensley 1988). In the model, this is called the intended value map of the company. Through market research, the company will try to match its intended value map with the preferences and desires of future users of its product to create a product that fulfils the customer needs. In the customer value model, these vague ideas are clustered at the second-order abstraction level as the desired value map of the customer. The term value map is used here, since the customer value of a product or service can best be described as a bundle of
values, which are the aggregation of benefits and sacrifices. A gap may occur between these two maps. This information gap reflects a situation in which the company has insufficient information about what the customer desires. Because of constraints in the company’s strategy and/or marketing capabilities, the company may focus on the “wrong” customer needs. This can create a huge loss during the development process.

After the business development process, a product is created and introduced to the marketplace. The value of the product as designed by the company is known as the designed value map in the model. The designed value may differ from the intended value because of technical restraints and/or miscommunication between marketing and product development. This will result in the design gap. When the product is “on-the-shelf,” it represents some kind of first-order value to the customer. Customers base their expectations of the product’s performance on their perception. This expectation is called the expected value map in the model. This map may differ from the desired value map because there might not be a product on the market that may exactly match the customers’ desires. Therefore, customers have to choose the product or service that best matches their expectations. In other words, they have to make a compromise between the value they perceive in the marketplace and the value they would desire. The smaller this compromise gap is, the greater the chance that the company is successful in winning customers. The perception gap reflects the potential mismatch between the value designed by the company, and the customers’ perception of this value. How potentially advantageous a product offer might be for customers—if they do not recognise this during the purchasing decision—is of no use to the company. A company can try to reduce this gap by making certain intangibles more tangible via corporate communication. (van der Haar et al. 2001).

After the purchase and usage stages, customers will evaluate the value they have received. In this model, the outcome of this evaluation is called the received value map. The satisfaction gap reflects the gap between the expected and the received value, as extensively described by Zeithaml et al. (1990).
This customer value model, Figure 3, describes the situation in which the company’s offers and the customer’s needs differ during the process. Both have influences on the process, and gaps describe why value changes. At the end, use makes a difference between a customer’s expectations and their satisfaction. From the company’s perspective, intended value is not the same as designed value; it is dependent on both internal and external reasons.

2.3.3 Summary

The following is a brief summary of what is known at this point. First, the definition of value is quite complex. This study focuses on the use situation, pre-, in-, and after-use experiences. A good definition of customer value is provided by Woodruff (1997): “Customer value is a customer’s perceived preference for and evaluation of product attributes, attribute performance, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations.” This definition suggests that a customer has a reason to buy and that he carefully evaluates what to use and how well the product fits a purpose.

At the operational level customer value is a trade off between what the customer receives (e.g., quality, benefits, worth, utilities) and what they give up (prices, sacrifices) to acquire the product. For example, Naumann (1995) describes five components of customer value; product quality, service quality, price, image, and relationship. Value is seen as a combination of quality attributes and price. Woodal (2003) identifies four main factors—customer factor, consumption factor, product factor, and market factor—influencing the customer’s valuation process. It is worth noting that all factors are not dependent on a customer’s experience, since market factors are also influential. Market factors include availability, competition, and perceived equity. The basic idea is
that a customer is willing to sacrifice a certain amount of time, effort, and money and to take certain risks in exchange for expected benefits that should outweigh total sacrifices.

Woodruff’s (1997) customer value hierarchy model shows how a customer learns to think about products as bundles of specific attributes and attribute performances. Collectively, these imply that there are both temporal and, consequently, cumulative aspects to value creation. In practice, the customer uses a rich set of valuation criteria, which can be either objective or subjective or a combination of both. A customer’s feeling of satisfaction is a result of a comparison process between perceived performance and one or more comparison standard, such as expectations.

Porter (1985) explained the sources of cost reduction and differentiation within a firm, and first introduced the concept of a value chain (consisting of strategically important company functions or activities that create both costs and customer value). According to Prahalad & Ramaswamy (2004b), in co-creation, direct interactions with consumers and consumer communities are critical. Also the existence and significance of the relationships is a central point in this study. In the next section, the interactions and exchanges are presented in detail.

2.4 Interactions and exchanges

This section concentrates on the relationship between buyer and seller organisations. Relationships are one of the main resources that influence value, because they involve customers and suppliers working together. All actions influence the development of a relationship and that ultimately influences future business. A relationship can be both a precondition and a consequence of the interactions between actors. At the same time, relationships are part of each value offering. An understanding of the different meanings and consequences of the relationships makes it easier to make decisions. The assumption made is that a relationship is long-lived and that both parties receive several benefits from it.

According to Storbacka et al. (1999), there are three levels in customer relationships: the contact level, the relationship level, and the overall level. The contact level refers to the purchasing situation in which representatives of both parties interact on a personal level. At the relationship level, the customer evaluates how well the chosen product or service supports the customer’s own value creation process, whereas at the overall level, the customer is also interested in understanding how well the supplier relationship supports the accomplishment
of the customer's overall goals and mission. Customer satisfaction is essentially a response to an evaluation of the performance of a perceived product or service. Satisfaction is based on customers' judgments of the value that has been created for them and impacts outcome behaviours such as word-of-mouth, complaining, repurchase intentions, and loyalty. (Woodruff & Gardial 1996).

In Lindblom’s model (2003) it was emphasised that exchange relationships develop as interplay between interaction processes and structural elements of the relationship. Furthermore, the development of exchange relationship was seen in the model initiated by the individual’s cognitive interpretation about the events taking place in the surrounding context. In sum, the model underlined that the development of exchange relationship must be seen ultimately as the result of cognitive processes at the individual manager level.

A company’s interaction with other parties leads to the activation and integration of its resources. A company’s control over these resources, its use of them in activities, its adding to and changing of its resource base is a response to various interactions and anticipated interactions. The interaction with others is, in this way, the force that unifies the company and gives it a capability to perform its activities. All companies are continuously involved in a wide range of interactions, for example in the acquisition of production inputs or finance, the sale of products or services, joint product development activities, system selling or co-operation within a trade association. This is called an interacted environment. (Ford et al. 1986).

Anderson et al. (1993) define value in business markets as follows:

“As the perceived worth in monetary units of the set of economic, technical, service, and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers’ offerings and prices.”

This exchange-centric definition is insufficient, because it assumes that exchange happens only once and that the only sacrifice is price. As mentioned earlier, exchange is only one step in a process that continues as long as both actors are satisfied. It depends on the strength of the relationship and how many negative impacts it can tolerate before a conflict arises.

In Blomqvist’s study (2002) a shared vision was found to be a pre-condition for individual-based fast trust leading to intuitive decision-making and experimentation. The relationships were tentative and they were continuously re-
evaluated through the key actors’ sense making of the technology content, asymmetry and the dynamic environment.

In co-creation, direct interactions with consumers and consumer communities are critical. Consumer shifts are best understood by being there, co-creating with them. Firms must endeavour to learn as much as possible about the customer through rich dialogue that evolves with the sophistication of consumers. The information infrastructure must be centred on the consumer and must encourage active participation in all aspects of the co-creation experience, including information search, configuration of products and services, fulfilment, and consumption. Co-creation is more than co-marketing or engaging consumers as co-sales agents. It is about developing methods to attain a visceral understanding of co-creation experiences so that companies can co-shape consumer expectations and experiences along with their customers. (Prahalad & Ramaswamy 2004a, 2004b).

2.4.1 Types of exchange

Ford (1997) talks about the different types of exchange: product/service exchange, information exchange, financial exchange, and social exchange. Product or service exchange usually forms the core of the exchange. The characteristics of the product or service have, in most cases, a significant effect on the relationship. The exchange process as a whole will be quite different depending on whether or not the product or service is able to fulfil the needs of the buyer.

Product or service exchange. The exchange of a product or service is often the core of the exchange. As a result, the characteristics of the product or service involved are likely to have a significant effect on the relationship as a whole. The exchange process will be quite different depending on whether or not the product is able to fulfil a buyer’s need that is easy to identify, and for which the characteristics of an appropriate product are easy to specify. It will also be important whether either the buyer or seller is uncertain as to the requirements or resources of their opposite number. (Ford 1997). Technical bonds stem from the characteristics of the products and services exchanged. Firms adjust products and processes to their partner’s requirements, subject to the constraints of technology and economics. They also require technical knowledge and some of this may be specific to one relationship. (Easton 1992).

Information exchange. The content of information is the most important aspect of information exchange. This can be characterised by the degree to which
technical, economic, or organisational questions dominate the exchange. Also, the depth and breadth of the information should be an important consideration. The way the information is exchanged depends on the value of the information. Impersonal communication is often used to transfer basic technical or commercial data. Personal channels are more likely to be used for the transfer of “soft data” concerning, for example, the use of a product, the conditions of an agreement between parties, or supportive or general information about either party. The degree of formality is dependent on the nature of the interaction process and the relationship between the companies as a whole. (Ford 1997). The collection of information is one of the primary uncertainty activities that firms adopt and to which networks provide a necessary vector. The relative ease of exchange and transmission means that information can flow around a network very quickly when the communication nodes are in place and connected. In this sense, there is a great difference from the slower responses that characterise the social and technical dimensions. (Easton 1992).

Informed, connected, empowered, and active consumers are increasingly learning that they too can extract value at the traditional point of exchange. Consumers are now subjecting the industry’s value creation process to scrutiny, analysis, and evaluation. Consumer-to-consumer communication and dialogue provides consumers with an alternative source of information and perspective. They are not totally dependent on communication flows from the firm. Consumers can choose the firms they want to have a relationship with based on their own views of how value should be created for them. (Prahalad & Ramaswamy 2004b).

Financial exchange. The quantity of money exchange is an indicator of the economic importance of the relationship. Another important aspect is connected with the need to exchange money from one currency to another and the uncertainties in these exchanges over time. (Ford 1997). Investments are processes in which resources are committed in order to create, build, or acquire assets for use in the future (Johanson & Mattsson 1986).

For the manager, all relationships are valuable in that they generate sales or product/service supplies, but some are more valuable than others. It is common to find that a relatively small number of counterparts account for a large proportion of sales or purchases. But financial dependence alone may not mean that the company values one relationship more highly than others. Relationships of low financial significance may be highly valued for their knowledge transfer, or for their reputational or network-access characteristics. The important consideration
for companies is to know what elements of a relationship confer its value and the extent of that value. (Ford & McDowell 1999).

**Social exchange.** Social exchange is also very important to take into account, especially given that all business relationships have some uncertainties. Instances of social exchange have an important role in reducing these. In cases where geographical or cultural differences exist between the parties and where the experience of the parties is limited, social exchange plays an important role. Many relationships are based on mutual trust between all parties involved. The building of trust is a social process, which takes time and must be based on personal experience. This process also requires successfully carrying out the other three aspects of exchange. (Ford 1997). Social relations between firms result from the relationships between the individuals involved. There is no guarantee that relations will be uniform although social pressures within the firm may induce conformity. It is also possible that social bonds will transcend and even replace economic bonds as the raison d’être for the relationship to continue. Social relationships extend beyond individual firms. (Easton 1992).

**Adaptation processes are related to exchange processes.** The more intensive the exchange process among firms the stronger will be reasons to make adaptations. The type of adaptations made is also related to the characteristics of the exchange, including frequency, complexity, and regularity. Similarly, exchange processes are intimately connected to relationships. Relational elements strongly influence the process of exchange, for example a firm will not order a product from a partner firm that it knows the firm finds difficult to produce. (Easton 1992).

According to Day (2000), central to every market relationship is an exchange process where value is given and received. Even in the most tenuous and short-lived relationships, each side of the deal gives something in return for a benefit or payoff of greater value. These exchanges line up along a continuum, with a single transaction at one end and a long-run, two-way collaboration at the other. Transactional exchanges include the kind of anonymous encounters a visitor to a city has in the taxi or bus from the airport, as well as a series of ongoing transactions in a business-to-business market where the customer and supplier focus only on the timely exchange of standard products at competitive prices. Both partners view the exchange as a zero-sum game where one side wins at the other’s expense so everything rides on the negotiation of terms and conditions. At the other end of the spectrum collaborative exchanges feature very close information, social networks, process linkages, and mutual commitments made in
expectation of long-run benefits. Between these two extremes are value-adding exchanges, where the focus of the selling firm shifts from getting customers to keeping customers. At the level of collaborative exchanges, there are multilevel contacts, the extensive sharing of information and shared incentives and goals are central. The firm pursues this objective by developing a deep understanding of their needs and changing requirements, and then by tailoring their offering to these needs as closely as possible, and by giving continuing incentives to the customer to encourage them to concentrate most of their purchases with them. (Day 2000).

Several sequences form the relationship. The sequences may follow one another directly, may overlap, or may follow with longer or shorter intervals depending, for example, on the type of business. This way of dividing the interaction process in several layers and on different levels of aggregation gives the marketer and the researcher a sufficiently detailed instrument to use in the analysis of the interactions between a supplier or service provider and customers. In the formation of a relationship over time many different elements in the interaction process, including goods and service outcomes, service processes, information, social contacts, and financial activities can be identified and put into their correct perspective. (Grönroos 2004).

2.4.2 Relationship features and development

Relationships are typically characterised in the business marketing literature as having core features: mutuality, long-term character, process nature, and context dependence.

Mutuality: Relationships may continue despite a low degree of mutuality because of the different kinds of bonds—technical, economic, planning, social, knowledge, and legal—between business actors. Mutuality between partners may be expressed with concepts such as trust and commitment. Counterparts within a relationship may be relatively balanced in their ability to influence the relationship; alternatively, one of the partners may dominate a relationship. None of the partners is assumed to have absolute control over the relationships, although their roles may differ. Firms develop some resources internally but most resources are gained through relationships with others in a business network. The resources might constitute financial, human, and/or technological assets. The combination of complementary skills and heterogeneous resources may be a major strength of business networks. (Holmlund & Törnroos 1997).
**Long-term character.** Relationships evolve over time and temporality is therefore a vital component of relationships. It takes some time before a sequence of interactions can be labelled an effective relationship. Both the *past and future expectations related to business relationships influence the present state.* Continuation reflects the strength of using learning effects and built-in skills for mutual benefits. Continuation might also be a competitive tool where the manifestation of relationships forms a specific asset and creates entry barriers for competitors. Strength refers to a firm’s resistance to disruption in a relationship. Strength is usually assumed to increase over time as the partners learn to work with each other and create bonds. The strength of business relationships is related to necessary investments, which make it costly to switch to other counterparts. The frequent lack of alternative partners also adds to switching costs, if the ties are sticky and customers have unique needs. The strength of the relationship is enhanced through commitment among interacting actors. (Holmlund & Törnroos 1997).

**Process nature.** Relationships are comprised of different interactions. The interaction process consists of a multitude of exchanges and adaptations between the firms involved. The content of exchange may include products, money, social contacts, or information. Relationships are characterised by change because of their dynamic nature. Processes and events within a relationship as well as in the surrounding network produce change and the dynamics in relationships. Critical incidents in interactions are important in this respect, as well as cyclical patterns within long-term change processes. Relationships are valuable to firms as they provide a form of access to resources. It has also been recognised that relationships may represent a possibility structure. (Holmlund & Törnroos 1997).

**Context dependence.** Embeddedness relates to the fact that economic action and outcomes, like all social action and outcomes, are affected by the actors’ dyadic relations and by the overall structure of network relations. Relationships are embedded in a network and are connected to other relationships in that particular network. Relationships are therefore highly context bound, i.e. their features are highly dependent on their particular setting. (Holmlund & Törnroos 1997).

Ford *et al.* (1998) examine the process of relationship change and development, and highlight the management tasks involved, by considering the different “stages” that a relationship can be in and how it moves between these stages. Managing business relationships is not a linear process of moving them in one direction towards some ideal state. Instead, it is much more about coping with
different circumstances at different times and with varying aims and expectations and with ways of dealing with many companies. Some of these interactions will be constructive and some will only damage the relationship. The stages are the pre-relationship stage, exploratory stage, developing stage, and the stable stage.

Every new relationship starts out from some pre-existing situation, where two actors meet and try to clear out possibilities in order to conduct business with each other. At this stage, several questions exist but there is very little in the way of trust, investment, or adaptation. Both parties will assess how well the demands match and the relationship will then start to develop, because it is assumed that both parties will seek long-term commitment. After several episodes and several interactions, the relationship becomes more serious, and this is called the exploratory stage. During this stage, the amount of learning that is required and that actually takes place in the two companies is probably at its greatest (Ford et al. 1998). Commitment becomes important at this stage and is based on the trust that starts to develop between the actors. The developing stage is the stage where the business is growing and mutual learning is more intensive. Trust is realised at the level of actions and not only in promises. During the stable stage companies have reached stability in their learning about each other and in their investments and commitment to the relationship. (Ford et al. 1998). The level of uncertainty in the relationship is low and the relationship becomes more like a routine. According to Ford et al. (1998), there is no certainty that adaptations and commitment will increase smoothly in any relationship, or that the distance between the companies will reduce or that trust will increase. This is partially because the individuals in each company are likely to have different ideas of how important the relationship is, what they want from it, and how open they wish to be when talking to their counterparts. If the relationship is to develop in the direction that a company wants then considerable management skills will be necessary, particularly in the case of important or complex relationships.

The decline into institutionalisation or the lack of apparent commitment by one party can mean that it no longer satisfies the changing requirements of the other. This can trigger the company to enter the pre-relationship stage with another company. Other relationship can switch into the development stage if either party is able and willing to respond to new or different requirements. Alternatively, a company’s experience in other relationships can highlight the value of an existing one and this can also move it back into the development stage. Most well established relationships will probably have gone through several periods of development and several periods of stability. But it is also important to
note that not all relationships will reach stability. Some will not develop, either because one party has insufficient resources or because one company has only a transitory need. Others will not develop, or will wither or die because one of the parties simply does not appreciate the value of what it is getting from the other and will then allow the relationship to fail. Even when companies realise the importance of their partner, they may allow the relationship to fade away through a simple lack of skill or inattention. Other relationships will cease to develop because of the efforts of other companies. (Ford et al. 1998).

Common suggestions that partnership is a “close” relationship are vague and do not offer much help. Ford et al. (1998) argue that in order to give meaning to “closeness” one has to consider the degree of integration between the buying and selling company. Focusing on integration is an important step toward a better understanding of the critical dimensions of supplier relationships. Consideration must be paid to the actual behaviour in relationships, rather than relying on a notion of partnerships as a matter of vaguely defined positive attitudes. We need to elaborate further on the extent of integration in relationships, and so we propose “involvement” as a relevant concept. We have found it useful to distinguish three dimensions of involvement that affect outcomes in supplier relationships: coordination of activities, adaptations of resources, and interaction among individuals. We refer to the degree of involvement in the three dimensions as activity links, resource ties, and actor bonds. (Håkansson & Snehota 1995).

First, the activities carried out at the supplier and customer companies can be more or less tightly coordinated. Examples of tight activity coordination are integrated delivery systems developed to reduce the costs of capital equipment investments and of material flow. Second, the resources of the companies can be more or less specifically adapted to the requirements of the counterpart. Joint development of customer specific products and dedicated processes, common in many supplier relationships, exemplify the case of extensive resource adaptations. Third, the individuals in the companies may interact more or less intensely. Close interaction among individuals in the two organisations make their choices more interdependent and affect both commitment and trust in the relationship, which in turn impacts on coordination and adaptations. (Gadde & Snehota 2000).

According to Dwyer et al. (1987), relationships evolve through five general phases identified as (1) awareness, (2) exploration, (3) expansion, (4) commitment, and (5) dissolution. At the first stage, the seller or buyer is supposed to search for a number of feasible exchange partners. A number of information sources may be used in the identification of potential partners, including the focal
firm’s network (Andersen & Buvik 2002). Exploration refers to the search and trial phase in relational exchange (Dwyer et al. 1987). The exploration phase is likely to be very brief, if at least one of the potential exchange partners perceives that he/she will be better off by turning to an alternative partner. If both parties plan to engage in a long-term relationship that involves a high degree of commitment through transaction-specific investments in products, processes, or people, the exploration phase is likely to include an extended period of testing and evaluation. (Andersen & Buvik 2002). The choice phase includes the selection of exchange partner(s) based on goal compatibility, trust, and performance. Commitment means involvement in the relationship. Dissolution entails the ending of the relationship.

2.4.3 Concept of relationship value

Normann & Ramirez (1994) posed that value is created as a result of a reciprocal interactive relationship between an organisation and its stakeholders. Slater & Narver (1994) connected value with a market-oriented culture and stated that marketers should aim to create superior customer value continuously. Gummesson (1999) and Ravald & Grönroos (1996) brought the relational perspective to value creation and argued that in a relational context, value for the customer is not embedded in a transactional exchange of a product for money. Instead, customer-perceived value is created, co-produced, and delivered over time as the long-term win–win relationship develops. Recent research findings show that the outcome of successful communication is the customer-perceived value that results from the increased connectedness between the buyer and the seller in their relationship with one another (Lindberg-Repo 2001).

According to Lindberg-Repo & Grönroos (2004), from a relational perspective, broadening the view of value requires an understanding that simply creating a contact between the buyer and seller is not enough to generate a relationship and thus potential value. A relational perspective on service communications emphasises that the relationship between buyer and seller can be strengthened even after the service encounter is over. The establishment of a deeper connectedness that enables a continued dialogue between the parties is required to strengthen the relationship. (Grönroos 1997, 2000). This deeper connectedness is created only if the communication system between the parties is sufficiently effective to transfer the sharing of meaning between the participants in a way that creates a dialogue through which the goals of both participants can...
be communicated in a reciprocal way (Lindberg-Repo 2001). A dialogue enables more than simple relationship maintenance; it facilitates relationship enhancement, one of the most important goals of relationship management. For example, Ballantyne and Varey (2006) see dialogue as an essential basis for the authentic pursuit of innovation and creativity in markets, within firms, and between firms. The test for dialogical authenticity is whether interaction brings opportunities for learning together. Such a test might focus on creating common rules of engagement including acceptable processes for disrupting strongly held but unexamined assumptions.

In Forsström’s study (2008) the general objective was to explore the development of a buyer-seller relationship from what was believed to be a traditional buying-selling –type of business relationship to a partnership. The focus was on why and how the relationship was developed into a partnership and how value was co-created by the parties through business interaction. The overall purpose is to explore the phenomenon of value co-creation - how value was co-created in a buyer-seller partnership, how such a partnership had emerged, and what the prerequisites for value co-creation were. As a conclusion of the development she argued that the partnership is a result of successful business interaction over time, technological dependence, possession of mutually complementary heterogeneous resources, a positive trade-off between benefits and sacrifices of involvement, personal relationships, and individuals with a strong vision in the partnership. The path towards a partnership has not been problem free; there have been conflicts between the parties along the way. However, the conflicts can be seen to have had positive effects on the development of the partnership when analyzing them in retrospect.

Ulaga’s (2003) summary of the emerging body of research on relationship value is modified and presented in Table 2. A careful review of these conceptualisations raises three important issues. First, although some common dimensions emerge, the proposed constituents of relationship value vary considerably among the definitions. Second, most dimensions are only described in very broad terms and do not provide a clear understanding of their underlying facets (i.e., ‘strategic benefits’ or ‘relationship costs’). Finally, no guidelines are provided as to how these dimensions could be combined to form an overall measure of relationship value.
Table 2. Concept of relationship value (modified from Ulaga 2003).

<table>
<thead>
<tr>
<th>Authors</th>
<th>Benefit dimensions</th>
<th>Sacrifice dimensions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson et al. 1993</td>
<td>economic benefits, technical benefits, service</td>
<td>price</td>
<td>theory-based</td>
</tr>
<tr>
<td>Anderson &amp; Narus 1998, 1999</td>
<td>benefits, social benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ravald &amp; Grönroos 1996</td>
<td>episode benefits, relationship benefits</td>
<td>episode sacrifices, relationship sacrifices</td>
<td>theory-based</td>
</tr>
<tr>
<td>Grönroos 1997</td>
<td>core solution, additional services</td>
<td>price, relationship costs</td>
<td>theory-based</td>
</tr>
<tr>
<td>Gadde &amp; Snehota 2000</td>
<td>cost benefits, revenue benefits</td>
<td>direct procurement costs, direct transactions costs, relationship handling costs, supply handling costs</td>
<td>theory-based</td>
</tr>
<tr>
<td>Lapierre 2000</td>
<td>product-related benefits, service-related-benefits, relationship-related benefits</td>
<td>price, relationship-related sacrifices</td>
<td>survey</td>
</tr>
<tr>
<td>Möller &amp; Törrönen 2003</td>
<td>efficiency function, effectiveness function, network function</td>
<td></td>
<td>theory-based</td>
</tr>
<tr>
<td>Walter et al. 2003</td>
<td>direct functions: quality, volume, safeguard indirect functions: market function, scout function, innovation function, social support function</td>
<td>direct function cost reduction</td>
<td>survey</td>
</tr>
</tbody>
</table>

Wilson & Jantrania (1994) were the first researchers to explicitly describe the dimensions of ‘relationship value’; these include economic dimensions (investment quality, value engineering, concurrent engineering, and cost reduction), strategic dimensions (core competencies, strategic fit, time to market and goals), and behavioural dimensions (social bonding, trust, and culture). They make the fundamental point that any relationship creates some value for both partners and how this value is shared is likely to be a major issue in the life of the relationship.
Further work by Gummesson (1999) proposes a number of fundamental values in relationship marketing, the core value being the emphasis on inter-party collaboration and the creation of mutual value. This derives from other work on relationship value and on the value constellation. Gummesson’s concept of ‘total relationship marketing’ emphasises the long-term win-win relationships with customers, which transcend boundaries and disciplines. Here, value is co-produced through the interaction of a number of additional stakeholders including suppliers, customers, competitors, and other players.

A satisfied customer creates a strong relationship with the provider and this leads to relationship longevity (or customer retention—customer loyalty). Retention again generates steady revenues and by adding revenues over time customer profitability is improved. Thus the firm can utilise potential customer relationship economic opportunities in a favourable way. (Storbacka et al. 1994). The basic sequence is: service quality leads to customer satisfaction, which leads to relationship strength, which leads to relationship longevity, which leads to customer relationship profitability. However, new perspectives are added to the sequence. According to Wagner et al. (2010) the higher the relational satisfaction of the buying firm, the more value it extracted from the sourcing relationship in the past. In line with the basic premise of equity theory, buying firms claim their share of the value pie less aggressively when they enjoy a high level of relational satisfaction. In contrast with the competition depicted in previous analyses, embedding a project in ongoing relationships leads to cooperative elements between suppliers and customer firms.

Firms that manage customer relationships in such a way as to leave little room for customers to have a voice, inject their view of how they want to (individually and collectively) interact with firms and consumer communities, and co-create value that customers are, by design, “willing to pay for” (Prahalad & Ramaswamy 2004a). But co-creation demands that both managers and consumers make the necessary adjustments. For example, both must recognise that the interaction between the two—the locus of value creation—must be built on critical building blocks. It must start from access and transparency. Firms have traditionally opposed transparency. The fight against product labelling is well known. Releasing information regarding the likely risks is often mandated. It must become voluntary. Further, transparency and access are of little value if the firms do not create the infrastructure for dialogue. This requires investment in technology but more important, investment in socialising managers and changing managerial practices. How does a firm engage in a dialogue? How do you
understand the underlying expectations of millions of consumers and their utility functions? (Prahalad & Ramaswamy 2004b).

2.4.4 Summary

Ford (1997) describes product and service exchange as the core of exchange. This exchange is based on customer’s needs, and how well a product or service fits to these needs. Technical information is an important part of the exchange. Information exchange is dependent on the value of information. Personal channels are used in a relationship. Financial exchange includes both the quantity of money and investments. Social exchange is important for building trust and it is also the base for social relations. In a relationship, trust and social relations become deeper, and their role becomes more significant. Interaction is not a simple mechanism regulating the life of the company, but a major part of its life. It is through interaction that a company exists and develops. Hence, interaction is a fundamental aspect of development. (Håkansson & Ford 2002)

According to Easton (1992), adaptation processes are related to exchange processes. The more intensive the exchange process among firms the stronger will be reasons to make adaptations. The type of adaptation is also related to the characteristics of the exchange, including its frequency, complexity, and regularity. Relationship features include mutuality, long-term character, process nature, and context dependence (Holmlund & Törnroos 1997). Mutuality includes the different kinds of bonds between actors. Long-term character evolves over time and past and future experiences are an important part of it. An interaction process consists of several exchanges and adaptations. Relationships are context dependent and they are an integral part of networks. Gummesson (1999) has argued that the creation of mutual value will become the core focus of both customers and suppliers and other stakeholders in the relationship, so that value is jointly created by all the parties involved in a relationship.

Relationship development is described as being in stages, in which closeness and involvement change the relationship from one stage to another. Relationships become stronger and deeper in each stage. It is possible that disappointments can return the relationship to an earlier stage. Several disappointments can cause a break-up and can end the relationship. A relationship orientation pervades all parts of organisation’s mind-set, values, and norms and thus influences all interactions with the customer, before, during and, after the sale. (Day 2000).
Relationship value consists of many benefits and sacrifices. Wilson & Jantrania (1994) describe the dimensions of relationship value; economic dimensions (investment quality, value engineering, concurrent engineering and cost reduction), strategic dimensions (core competencies, strategic fit, time to market, and goals), and behavioural dimensions (social bonding, trust, and culture). Further, Storbacka et al. (1994) use a relationship profitability model to connect quality, satisfaction, relationship strength and longevity, and profitability.

The impact of IT upon marketing practice has been seen in the development of the ability to both individualise offers and to develop two-way communication between customers and firms. These developments have led to an increase in the information intensity of the firm, and to an increase in the importance of the activities taking place outside the immediate boundaries of the customer/firm relationship. In particular, this relates to activities in legal and ethical environments and in the arena of strategic co-operation between firms. Problems encountered by firms in developing customer relationships include goal incompatibility in the acquisition and use of customer information, the need to focus on economies of scope rather than simply those of scale when developing individualised customer offerings, and the importance of cooperative interdependence both within and between firms. (Peters 1997).
3 Software business

This chapter concentrates on the special characteristics of software business. Several forces are driving customers and their suppliers to intensified levels of collaboration, which eventually leads to a vertical partnership. In general, the high level of coordination implied by modern and intense competitive markets has induced industrial customers to reduce their supplier base. As a consequence, collaboration between buyers and sellers becomes more intensive and contains new elements and processes that are subject to cooperation such as joint research and development projects or business development. (Ploetner & Ehret 2006). In a software business context, collaboration is explained by some software development theories. For example according to Rönkkö et al. 2009 software business is business of selling software (including systems software, application software, and games) either as licenses or as services and services related to development and deployment activities of this software. This definition does not include operating of software produced by third parties (e.g. operating a server firm), business and operations consulting related to software systems, and deployment projects of third-party software. Not all revenue of firms operating in the software industry is necessarily software business.

3.1 Types of software business

According to Messerschmitt & Szyperski (2003), in the real world, software touches the personal and professional lives of most individuals. Of course, for most people this is in the sense of being a user and beneficiary of software. For a smaller (but still very significant) number of people, their professional lives are directly involved in facilitating the creation and use of software, or understanding its effects on individuals, organisations, or society.

Currently the software industry is going through several transitions. First, we can see the proliferation of computing devices due to the explosive growth of smart phone software, the emergence of tablet computers, and the application enabled television sets that have been announced during the summer 2010. Second, the functionality of the software is moving from the end-user terminal to the servers run by the software provider. Third, the growth of the software markets is predicted to move more toward the developing markets rather than U.S. and Europe that are currently the two largest software markets. Finally, recession has typically strengthened these kinds of changes. While the software industry is
predicted to grow for the foreseeable future, some of these trends are cannibalistic: It is currently more difficult to make money with packaged software for many companies than it was just a couple of years ago. Moreover, the proliferation of computing platforms can potentially cannibalize the sales of low-end computers and hence affect software sales in the near future. (Rönkkö 2011).

Software business and technology are not separated. They support each other. Software is valued for what it does, but it requires a computer processor to realise its intentions. Software most closely resembles a service in the industrial economy: a service is immaterial, but it requires a provider (mechanical or human) to convey its intent (Messerschmitt & Szyperski 2000). In this study, software product and its service are closely related. In practice, a software product always demands some service. This service part can entail installation, updates, or support in varying combinations.

According to Hoch et al. (1999), two main business types are software (professional) services and software products, with the products divided into two segments: enterprise solutions and mass-market packaged software. What differentiates enterprise solutions from packaged software is that it takes substantial time and effort to get enterprise solution software up and running. Each piece must be customised. Software product and service firms clearly depend on each other, especially in enterprise solution installation. They also share common business dynamics, such as low entry barriers, fast innovation, and the threat from new entrants. But a structured analysis of the importance of key success factors in their global survey also shows that the differences between software product and professional services business are quite substantial. Despite the substantial differences between product and services business, they share some similarities. Their leaders, for instance, are similar in that they not only have to accept uncertainty, but they have to thrive on it. In fact, leadership is one of the most important ingredients in software success (Hoch et al. 1999).

Further, Tähtinen (2001) presents a comparison of the two types of business, project and product business. A third type of business could be added: enterprise solutions. Although enterprise solutions are classified as products, Tähtinen places them closer to project business than to product business. This is because of the need for tailoring that enterprise solutions entail. In project business, the object of exchange is the unique software that is designed and developed in cooperation with the customer for a specific platform. It can include training and maintenance. Service content is high. In product business, the object of exchange is standardised and/or modular product designed for several different platforms.
The service content is low and the customer base in project business is narrow, well-known, and with fairly large customers. In product business, the customer base is broad, faceless end-customers. Production in project business consists of; activities within projects; products which are sold before they are produced; connections with all functions of the vendor; deadlines according to project plans; and almost constant and high marginal costs, which makes the capacity utilisation rate important. In product business, production is; duplication; version control; sold after being produced; independent from other vendor functions; and has low marginal costs. (Tähtinen 2001).

Alajoutsijärvi et al. (2000) see project business and product business as extreme polar opposites along a continuum highlighting changing business logic when moving from tailored systems towards increased productisation. Larger players in the international market for packaged software already act in accordance with the transactional logic-labelled product business. On the other hand, small and locally operating companies typically follow the relational logic that is connected to more or less unique project deliveries and to the project business. The objective of many small companies to enter the more transactional product business can be seen as paradoxical from the marketing theory point of view that currently emphasises the development of intensive, long-term customer relationships. From an entrepreneurial viewpoint, however, this desire is not surprising. Bill Gates did not get rich through selling tailor-made, labour-intensive systems; he productised his expertise in operating systems and eventually achieved worldwide mass-marketing success.

According to Alajoutsijärvi et al. (2000), through positioning themselves in accordance with their dominance business logic on the one hand and their primary marketing approaches on the other, companies can identify their managerial challenges during their growth and internationalisation processes. The matrix describes four different situations that companies may face. Cell (1) depicts the typical situation, in which the company operates in project business within established customer relationships with a relational marketing approach. On the other hand, cell (4) depicts the objective of many software companies in internationalisation: following the marketing mix approach. Cell (2) depicts some kind of intermediate form between ‘pure’ relational project and international mass-product business. It is questionable whether cell (3), project business in accordance with the marketing mix approach, will ever be a feasible alternative.

While moving from cell (1) to cells (2) and (4), an important issue is managing the risk perceived by small software companies’ foreign partners and
customers. Risks related to the acquisition of software can generally be divided into the following components: those related to an unfamiliar product and those related to an unknown supplier. Productisation reduces the risk related to the product, since the buyer can test its functionality before the purchase decision is made; this is not possible when buying tailored systems. On the other hand, small software companies must establish credibility as reliable suppliers when entering foreign markets. This cannot be done without developing mutually oriented relationships with cooperative partners in target markets. The internationalisation process essentially involves the incremental creation of personal relationships with foreign customers, that is, building a basis of trust. This is directly connected to the reduction of uncertainty and risk perceived by customers and development of the long-term relationships can be seen as an important element in building customer loyalty. (Alajoutsijärvi et al. 2000).

In business-to-business marketing, product and service offerings and solutions are often customised. Customisation requires idiosyncratic knowledge of critical customers and often customer segments with only one constituent. It even requires intimate knowledge of the different value desires of many individuals within a customer organisation. Customised products and services ought to address more than what these customers (companies and individuals) currently value; they should also consider what these customers will value in the near future. (Flint & Woodruff 2001). The customer’s role becomes more interactive during this period of “closeness”. The supplier wants customers to be capable not only of conveying their needs, but also of being part of the development process and even sharing the development costs. Customisation is expensive and takes time.

Sallinen (2002) finds five supplier types in her study. First, the resource firm is a rather small software subcontractor when measured by both its number of personnel and turnover. Second, a resource firm with supporting projects and products bases a majority of its business on hiring out human resources at an hourly rate. The rest of its operations consist of management of software (sub)projects and/or production of software products or modules. Third, a software product firm bases its business entirely on the independent production and selling of software products. Fourth, a software product firm with supporting projects. Fifth, the system house has no single, principal way of operating; rather, its operations consist of essentially equal proportions of the production of its own software products/modules, managing (sub)projects and hiring human resources.
According to Rönkkö & Peltonen (2011) software industry is also a small but a part of all professional software development. They classify these activities into four categories; in-house systems and customer tailored software (lower degree of standardisation), and embedded software and software products (higher degree of standardisation). The traditional categorisation of software business has into software products and custom-made software is reflected on the horizontal axis of our classification. The vertical axis “visibility of software in the offering” refers to how apparent it is for the customer that part of the product or service being purchased has software as a central component or is produced by software. This is related to trend that software is becoming more and more ubiquitous and software development a central part of product development and service design. Again, on the lower half of the figure the degree of standardisation refers to the replicability of software. In the lower left quadrant, the software is often unique and exists only on one server or server system while in the lower right quadrant the same software is copied on several devices that are sold to different customers.

In principle, software built on open standards allowed customers to source from any supplier that could supply software in accordance with open standards (for example, Java- and XML-based systems). Open standards meant that prices dropped and functionality was enhanced, which resulted in a mass market for many software application types. (Damsgaard & Karlsbjerg 2010).

According to Cusumano (2004) there are clearly some positive implications of open-source and free software for people interested in software’s commercial aspects. First, and perhaps most important, open-source types of activities have promoted behavioural norms that enable many programmers around the world – numbering in the hundreds and perhaps thousands for Linux – to participate in a widely distributed and loosely coordinated innovation process. Users can contribute more than ideas: they can take the source code for a software product and make it do something better than it did before or make it do something entirely new. Second, the open source phenomenon has increased the availability of important software products or technologies – for free. Some of these have made major contributions to society as well as to the evolution of software and information technology. Third, there have been some new business opportunities. A number of commercial (“for profit”) firms have attempted to exploit the open-source movement and the interest in programs such as Linux, although the record here is not good. There were also several cases of software products or solutions companies that explored different ways to take advantage of the open-source movement to enhance their platforms or generate complementary products.
3.1.1 Growth in the software business

Growth is often measured by the number of customers served so that selling products to the mass market is the easiest way to reach a large customer group. This is a contradiction, when thinking about the development process, which is based on customers’ needs. Customers in mass market are interested in generalised products. They want products which are largely tested and used, and which have been on the market for longer. Products are not even close to this stage when they are new and innovative. It is important to note that customers are not the same throughout the product’s entire lifecycle, and that they change from one group to another as the demands of development work alter. This kind of development helps to reach different customer groups and the change driven offerings then fulfil their needs.

In fact, successful software product companies spend massive amounts of money on marketing and sales; typically more than twice their R&D costs. The reason for that is simple, for software companies it is not enough to be one of the top players in a particular product segment, it is crucial to be the top player. Behind this is the idea of increasing returns; the more customers you have, the more sales you will get. (Hoch et al. 1999)

- First, interaction standards start the cycle. Whenever one person uses a particular kind of software, the chances are heightened that others working with that person will also use the same software.
- Second, personal switching costs increase over time. Once users learn how to use a certain product, they become less inclined to switch to a competitor’s product.
- Third, trust in market leaders facilitates buying decisions. Corporate IT decision makers tend to buy into prevailing front-runners when they make their purchasing decisions (Hoch et al. 1999).

Rogers’ (1995) technology adoption life cycle model describes the number of customers added per unit of time. The first group is innovators, who are able to cope with a high degree of uncertainty about an innovation at the time of adoption. They need the ability to understand and apply complex technical knowledge. Innovators must also be willing to accept an occasional setback when a new idea proves unsuccessful, as inevitably happens. They have an important role as a gatekeeper. Early adopters are a more integrated part of the local social system than innovators. This adopter category, more than any other, has the greatest
degree of opinion leadership in most systems. The early adopter decreases uncertainty about a new idea by adopting it, and then conveying a subjective evaluation of the innovation to near-peers through interpersonal networks. The early majority adopt new ideas just before the average member of a system. The early majority’s unique position between the very early to adopt and the relatively late to adopt makes them an important link in the diffusion process. The late majority adopt new ideas just after the average member of a system. Like the early majority, the late majority make up one-third of the members of the system. Adoption may be both an economic necessity for the late majority, and the result of increasing network pressures from peers. Innovators are approached with a sceptical and cautious air, and the late majority do not adopt until most others in their system have done so. Laggards are the last in a social system to adopt an innovation. The point of reference for the laggards is the past. Decisions are often made in terms of what has been done previously, and these individuals interact primarily with others who also have relatively traditional values. The laggards’ precarious economic position forces the individual to be extremely cautious in adopting innovations. (Rogers 1995).

Moore (1991) found gaps between innovators and the early majority and between the early majority and the late majority. These gaps are relatively minor “cracks in the bell curve”. The first gap occurs when a hot technology product cannot be readily translated into a new major benefit. By the second point on the curve, the market is already well developed and the technology product has been absorbed into the mainstream. The key issue is how technology competent the end users are and should be. Simply put, the early majority is willing and able to become technologically competent, where necessary; the late majority, much less so. When a product reaches this point in the market development, it must be made increasingly easier to adopt in order to continue being successful. If this does not occur, the transition to the late majority may well stall or never happen. More important than these two cracks in the bell curve is the deep and dividing chasm that separates the early adopters from the early majority. According to Moore (1991), this is by far the most formidable and unforgiving transition in the technology adoption life cycle, and it is all the more dangerous because it typically goes unrecognised. The reason the transition can go unnoticed is that with both groups, the customer list and the size of the order can look the same. The problem is that if the bigger user groups don’t hear of the product, it can’t be a big success.
According to Wind (2005), a focus on growth requires an integrated approach, cutting across organisational functions and activities. In general, organisations have several different options for growth. All of these options depend upon marketing insights into the unmet needs of current customers or the needs of other market segments that could be met with the company’s current set of products and services or new product and service offerings. These strategies for growth also require the involvement of many different disciplines. New product development engages R&D, operations, finance, and other areas, in addition to marketing. Moving into new market segments involves gathering information, operations, finance, and other areas in addition to marketing. (Wind 2005). The same offering will not fit the needs of all customers and the real needs of customers must be identified so that more information must be gathered.

As the business environment changes, existing markets may be eroded and new opportunities for growth may emerge. If the organisation is trapped in the current mental model of the industry and business, it may be hard for managers to see emerging competitive attacks or market possibilities. And if the organisation is not able to think and act across disciplinary lines—with a market-driven approach—it may be very difficult to act upon these new insights and turn them into strategies for growth. According to Wind (2005), among the strategies for the marketing perspectives used to drive growth are the following:

- Creating a market-driven vision and value proposition;
- Using market insights to drive innovation;
- Leveraging technology and marketing to create convergence;
- Rethinking the customer experience and relationships.

The findings of Perks (2004), suggest that the ability to specify partner activities and assess partner capabilities can influence the timing and nature of partner involvement. A two-way capability display, along with organisational flexibility and adaptability can enhance partner activity specification over time. Her study shows that an attention to pacing and synchronisation of partner activities can also add value to the development process.

Success in business can be measured in at least two ways: market share and the number of customers. The firms that succeed insist on communicating a clear value proposition to customers, and that seems to make all the difference. Rather than advertising a product’s features, successful firms advertise company brands. They cannibalise their current products by introducing new products up to twice a year, often before the current version even reaches the cash cow phase. They
apply creative software entry-pricing techniques to build their customer base. They also take innovative approaches to PR, often letting their partners pick up the check for extravagant promotions. Firms frequently establish and communicate completely new platforms, build marketing alliances and preinstall software with the aim of reaching, sustaining, or taking over the pole position and becoming “category killers”. (Hoch et al. 1999).

Increasing market share requires taking customers away from competitors or attracting a disproportionate share of new sales; the latter is especially effective in rapidly growing markets. Economic theory suggests that, assuming equally effective marketing and sales efforts, customers gravitate toward products with the largest consumer surplus—the difference between value (willingness to pay) and total cost of ownership, including recurring operational and acquisition costs. Software design should, therefore, focus on both increasing value and reducing the customer’s total cost. In all cases, the focus should be on paying customers (often an organisation), and not just on the software’s users. (Messerschmitt & Szyperski 2004).

To maximise revenue, value pricing implies price discrimination (basing unit price on something other than the marginal unit costs incurred on a customer’s behalf). Approaches include segmenting customers into groups and charging different prices (for example, student discounts) or negotiating prices directly (for outsourced development or large site licenses). A common approach with strong design implications entails creating different product variants, all available for sale at the same time, and letting customers self-select on the basis of their willingness to pay. To support this, the design must explicitly allow different combinations of feature and performance sets that are not user configurable. (Messerschmitt & Szyperski 2004).

Companies are capable of providing an innovative response to the needs expressed by their customers thanks to the use of their technological, marketing, and organisational skills; and it is precisely the adoption of a customer perspective that allows the identification of customer needs and the obstacles preventing their satisfaction (Parolini 1999). Further, precise analysis should be based on the careful segmentation of the market to identify those segments that require different types of actions or products.
3.1.2 Software products

Software products and services are a basic item in the exchange. In this study, the focus is on organisations in product and enterprise systems business, and this is explained carefully in this section. The costs of developing the first version of a software product are high, but after that, copying costs are very low. Copying is easier if products are constructed on a platform. From a pure business perspective, selling the same product to the mass market could be best alternative. Unfortunately, in reality customers are more demanding, and want products that fit their specialised needs. The right answer could be some kind of compromise between economical and customer-based starting points, within the limits of resources.

According to Nejmeh & Thomas (2002), the goal of software product planning should be to maximise the product’s value within the available resources. Any software distribution defines the scope of potential customers by targeting an infrastructure platform (a set of capabilities assumed to be available and static) and complementary software that is assumed to be available. Porting and maintaining software for more platforms can increase revenues but can also increase development, maintenance, testing, and support costs.

According to Ulrich & Eppinger (2000), software products could be divided into four categories:

- Process-intensive products; product design tightly linked with production process design (chemicals, foods);
- Customised products; setting values for design variables (carefully defined, detailed development process);
- Platform products; incorporating pre-existing technological platforms (already useful in the marketplace) into several different products;
- Technology-push products; starting with pre-assumptions about a particular technology and looking for an appropriate market in which to apply this technology.

Platforms are particularly important in high-tech companies, which have several products based on the same technology. Some of the positive aspects include the structure of costs, possibilities for making different variations, and time saving opportunities. A product platform is more than just a product. It is a collection of common elements, especially the underlying defining technology, implemented across a range of products. In general, a platform is the lowest common
denominator of relevant technology in a set of products or a product line. (McGrath 2001).

Meyer & Utterback (1993) added core capability as a key driver for successful product platform development. They claim that core capabilities cannot be separated from the products the company produces. A robust product platform is the heart of a successful product family where generic core capabilities in any product family exist in product technology, market understanding and so on. A product family is defined as products that share a common platform, but that have specific features and functionality. This approach enables companies to create products for different market segments by using a common product platform. Successful product family development requires a solid understanding of customer requirements and of their technical infrastructure. Management must identify the importance of the product platform development and its impact on long-term product development productivity, as product platform development has a longer lifecycle than individual products. The platform enables companies to create product variations more effectively than creating each product from the beginning.

According to Cusumano (2003), software product business is mainly about volume selling or licensing the most copies possible of a standardised product. The basic growth strategies here are scaling or duplicating what has been done in similar markets. Microsoft has set the model for such firms, which ensure volume sales by setting de facto technical standards that “lock-in” customers, whose software applications and databases only work on a particular operating system or hardware platform. The development organisation needs to focus on creating a stream of new products and upgrades at regular intervals (à la Windows 95, 98, and 2000) with standardised features sufficient for the largest possible set of users. Mass marketing and distribution skills are critical. Part of the strategy for a products company might also include trying to become a platform leader, although most software companies create complements—products that work with and add value to a platform, such as a Windows PC or Unix workstation, or a handheld device powered by the Palm operating system.

Cusumano (2004) proposed a simple model suggesting that at least some software product companies, as they mature, become service (and maintenance) companies over time. This model suggests that firms may start out focusing on products and intending to remain as product companies. Eventually, however, services revenues may increase to the point where, for an interim time period, companies are really “hybrid solutions” providers of products and services. At
some later point, the revenue streams “criss-cross” and services become larger than product revenues. It is very difficult to differentiate between a software product and service, because almost always products need some kind of service – installation, support, training, or at least updating in order to work properly. Combinations of products and services force suppliers and buyers to work together and to maintain relationships.

According to Valtakoski (2011) significance of the services has increased during recent decades. His findings present that services have an important position also in software business. Although organisations’ get over half of their incomes from product sales, they see knowledge-intensive services as remarkable part of their business. They keep up the customer relationships, develop their knowledge of customer line of business and make sure of software products utility for customer organisations by service help. Offering services have direct connection to organisation’s success, especially growth of incomes.

In a software market the whole product contains typically a core software product provided by a software product company and complementary integration services provided by, for example, an IT consulting company. For example, in the early phases of ERP technology evolution the product licenses of SAP accounted for about 20% of the sales price of a customer delivery (Hoch et al. 1999) while services of IBM, Accenture and other IT integrators accounted for about 80% of the delivery. The price erodes along with the volume of services, until in the late phases of the lifecycle the product vendors try to increase their sales volume by increasing service revenues. (Tyrväinen & Frank 2008).

3.1.3 Software product’s quality and price

According to Zeithaml (1988), the value is determined by the quality received relative to the price paid. This definition is based on an old assumption, that with a low price the quality is low and vice versa. In software business, quality plays a special role as part of product development. Quality is also one of the main attributes, which could be defined as a benefit of the software product. In this chapter, quality is defined from several perspectives, since this will make it easier to understand its dimensions and significance in software business. Zeithaml (1988) proffers that value is determined by whatever is actually wanted from a product. Price is seen as a main sacrifice, which has to be paid before there are any benefits or value. Quality and its sub characters can be defined as product
attributes, which are a base for customer evaluation and also tools for a supplier’s value offerings.

By the early 1980s, “quality” became a popular theme in industry. Software development and testers started to get together to talk about software engineering and testing. Groups were formed to eventually create the many standards we have today. International standards are currently becoming too weighty to digest in their full-published form for everyday practical purposes. However, they include important guidelines and baselines for contracts and also provide invaluable references. In 1981, Browne and Shaw stated that the software engineering is a technical activity for which we have developed a large set of ad hoc engineering techniques without a corresponding scientific foundation. (Mantere & Alander 2005).

According to Pfleeger (1998), quality has to be considered in at least three ways:

- Quality of the product;
- Quality of the process that results in the product;
- Quality of the product in the context of the business environment in which the product will be used.

Quality can be defined broadly as superiority or excellence. By extension, perceived quality can be defined as a consumer’s judgment about a product’s overall excellence or superiority. Perceived quality is (1) different from objective or actual quality, (2) a higher level abstraction rather than a specific attribute of a product, (3) a global assessment that in some cases resembles attitude, and (4) a judgment usually made within a consumer’s evoked set. (Zeithaml 1988). Total quality broadens prior notions of quality in that it includes consideration of business processes (e.g., changes in people, materials, equipment, methods, and environment) for providing complete customer satisfaction on the full range of product and service needs (Mohr-Jackson 1998).

According to Glinz (2008), the advantages of quantifying quality requirements are obvious: we get unambiguous, verifiable requirements and thus reduce the risk of delivering systems that don’t satisfy stakeholders’ desires and needs. So it is tempting to state: “You shall quantify all quality requirements” as the first commandment of quality requirements engineering.
ISO/IEC 9126 is the classic international standard for software product quality, both external and internal. The factors involved here are:

- Functionality: suitability, accuracy, interoperability, security, and functionality compliance;
- Reliability: maturity, fault tolerance, recoverability, and reliability compliance;
- Usability: understandability, learnability, operability, attractiveness, and usability compliance;
- Efficiency: time behaviour, resource utilisation, and efficiency compliance;
- Maintainability: analysability, changeability, stability, testability, and maintainability compliance;
- Portability: adaptability, installability, co-existence, replaceability, and portability compliance. (Bevan and Azuma 1997)

The disadvantage of quantifying quality requirements is equally obvious: it can be time consuming and expensive. At this point, we should remember that requirements are a means, not an end. We want requirements that deliver value, defined here as the benefit of reducing development risk (developing a system that doesn’t satisfy stakeholders’ desires and needs) minus the cost of specifying the requirements. Consequently, we should replace the rule “You shall quantify all quality requirements” with “A quality requirement should be represented such that it delivers optimum value”. (Glinz 2008).

The particular metrics used will depend on the business priorities for the product and the needs of the evaluator. According to Bevan & Azuma (1997) the ISO/IEC 9126 model supports a variety of evaluation requirements, for example:

- A user or a user’s business unit could evaluate the suitability of a software product using metrics for quality in use;
- An acquirer could evaluate a software product against criterion values of external measures of functionality, reliability, usability, and efficiency;
- A maintainer could evaluate a software product using metrics for maintainability;
- A person responsible for implementing the software in different environments could evaluate a software product using metrics for portability;

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A developer could evaluate a software product against criterion values using internal measures of any of the quality characteristics.

Quality in use is the user’s view of the quality of a system containing software, and is measured in terms of the result of using the software, rather than the properties of the software itself. Quality in use is the combined effect of the software quality characteristics for the end user. It can be measured by the extent to which the specified users can achieve their goals with effectiveness, task efficiency, and satisfaction. Effectiveness can be measured by the accuracy and completeness with which users achieve specified goals, task efficiency by the resources expended in relation to task effectiveness, and satisfaction by attitudes to the use of the product. (Bevan & Azuma 1997).

Open source software can appear unattractive and risky to some because there is no central point of control from which advice about the software package and its future development can be sought. Others view these properties as strengths since they protect the standard package from the opportunistic actions of profit maximizing software producers. (Damsgaard & Karlsbjerg 2010).

Garvin (1988) provides a detailed overview of the literature on the relationship between quality and price. The author distinguishes between two bodies of literature: economics and marketing. Both approaches generally agree that quality and price should be positively correlated. However, they show some differences. Economists assume that customers possess sufficient information to evaluate product quality and that higher product quality can be produced only at higher cost, because additional labour, materials, or capital are required. As long as costs and prices are positively related, quality and price will move together as well.

Marketing researchers, on the other hand, have addressed the problem of asymmetric information (the seller is better informed about quality than the buyer). In such a context, cues, such as packaging, advertising, word-of-mouth, or branding, become important for evaluating product quality. Price potentially conveys two opposite functions: on the one hand, it may be perceived as a sacrifice and on the other hand as a symbol of extra quality, value, or prestige. (Garvin 1988).
3.1.4 Summary

According to Hoch et al. (1999), two main types of software business are software services and software products. Products can be divided into two segments; enterprise solutions and mass-market packaged software. Product and service firms support and are dependent on each other in the enterprise solution business. Tähtinen (2001) divides project and product business, where project is tailored software and product is packaged software. A third element is enterprise solutions, which is closer to project than product business. Based on the productisation level, software product business offerings are highest degree of productisation, and software service business is lowest degree. Enterprise solutions are in the middle.

Growth in a software business can be described by the number of customers and the firm’s market share. The law of increasing returns supports the idea of selling the same product to several customers. Increasing market share means taking customers away from competitors. The third way to grow is to maximise revenues: generate more profits and reduce the sacrifices made and the resources used.

Software products can be divided into four groups; process-intensive products, customised products, platform products, technology-push products (Ulrich & Eppinger 2000) Cusumano (2004) proposed a simple model suggesting that at least some software product companies, as they mature, become service (and maintenance) companies.

Increasing quality—assuming it is done at all—can simply raise expectation levels; the net result may be no change in satisfaction levels. And, of course, satisfaction is not only based on perceived quality even if we define that as widely as possible; it is influenced by other factors, especially price. Value can be defined simply as the ratio of perceived benefit to perceived cost. (Evans 2002). Quality is also time-consuming and expensive, this makes it impossible to select and produce the highest quality all of the time.

The quality approach offers product attributes, which are important for at least two reasons. They are important to the supplier, who can use them to satisfy customer’s needs. They are important to the customer, because they are a base for a cost-benefits analysis. The quality of a software system is primarily determined by the quality of the software process that produced it. Likewise, the quality and effectiveness of the software testing process are mainly determined by the quality of the test processes used. More than half of all errors are usually introduced in
the requirements phase. The cost of errors is reduced the earlier they are detected. An effective test programme prevents the migration of errors between the development phases. (Mantere & Alander 2005).

### 3.2 Software product creation

This section is focused on software product creation, not development, because development does not provide a sufficient explanation of the process. Basic software products can be developed, but when the software product is created, service is a fundamental part of the process. It is more customised and tailored than a developed product. Software product creation includes structuring the offering.

The creation of a new software product often involves large teams of specialists applying complementary skills with a high overhead for coordination. Especially with application software, achieving a successful product requires close cooperation with users and eventual customers (including managers and operators) and the effective management of large teams of programmers. Effective software creation is thus an organisational and management challenge as much as it is a technical challenge. (Messerschmitt & Szyperski 2003).

The aspect of creating software that is most closely associated with technology is software development, which refers to the range of activities (including design, implementation, testing, maintenance, and upgrade) surrounding the creation of working software programmes (Pressman 2000). Software product development is an iterative process, which consists of activities and resources needed to produce the software. In the same way, the process also needs actors to maintain these activities and to make decisions during different phases. The product must be maintained and supported after being produced and delivered to buyers. The last phase is closedown, when the product is no longer in production or when another version replaces it. The market is a changing environment, which makes difficult to predict customer’s requirements and the product’s ultimate success.

Ulrich & Eppinger (2000) list some of the characteristics that make product development challenging: one of the most difficult aspects of product development is recognising, understanding, and managing the trade-offs in a way that maximises the success of the product (trade-offs). Technologies improve, customer preferences evolve, competitors introduce new products, and the macroeconomic environment shifts. Decision-making in an environment of
constant change is a formidable task (dynamics). The choice between using screws or snap-fits on a computer enclosure can have economic implications of millions of dollars (details). Any one of these difficulties would be easily manageable on its own and given plenty of time, but product development decisions must usually be made quickly and without complete information (time pressure). Developing, producing, and marketing a new product requires a large investment. To earn a reasonable return on this investment, the resulting product must be both appealing to customers and relatively inexpensive to produce (economics).

In software development, an important issue is whether process improvement pays off in terms of higher quality, reduced cycle time, and lower costs. Under the conventional paradigm, higher quality can be achieved only at the expense of increased development expenditures and longer cycle times. From this perspective, effort expended to improve software development processes varies with the quality level attained. A typical view of software managers operating with this paradigm is: “I’d rather have it wrong than have it late. We can always fix it later”. (Paulk et al. 1995).

### 3.2.1 A generic product development process

Several researchers have noticed that effective co-operation between research and development (R&D) and marketing increases the success rate of new product development (Atuahene-Gima & Evangelista 2000 and Cooper & Kleinschmidt 1987). According to Lu & Yang (2004), there are two main reasons for that; first, product life-cycles are so short that the companies deliver new products before they have any market value and second, the rapid changes in technology and the marketplace force R&D and marketing departments to cooperate closely in order to react to sudden changes. Product development is an interdisciplinary activity requiring contributions from nearly all the functions of the firm; however, three functions are almost always central to a product development project: the marketing function mediates the interactions between the firm and customers; the design function plays the lead role in defining the physical form of the product to best meet customer needs; and the manufacturing function is primarily responsible for designing and operating the production system in order to produce the product (Ulrich & Eppinger 2000). Product development, including joint work with marketing, manufacturing, and management activities (Ulrich & Eppinger
is a highly interactive process involving individuals with different objectives and capabilities.

According to Ghingold & Johnson (1997), knowledge, and technical knowledge in particular, is a valuable and strategic resource for virtually any business. A study examining the relationship between technical knowledge and technology-related decision making by manufacturing/operations managers indicated a strong linkage between technical knowledge and managers' utilisation of more desirable decision styles and the achievement of better outcomes in their decisions. The findings confirm the proposition that technical knowledge is a valuable resource that yields positive results for firms with manufacturing and process operations. The extent to which this resource (technical knowledge) is acquired, stored, disseminated, and used will, in part, determine a firm’s long-term competitiveness. Purchasing and marketing management have important responsibilities in this context. Proactive, strategic purchasing adds new priorities such as developing knowledge sources and managing knowledge procurement.

Customers' perceptions of the value added by a vendor's technical knowledge and capabilities have a number of important implications for marketing management. The first is literal, that is, technical knowledge and technological leadership are important competitive considerations and should not be neglected. Too often, marketing is disconnected from engineering and R&D. (Wilson & Ghingold 1987). To the extent that strengths in technical capabilities, expertise and leadership foster marketing and competitive advantage, they can become marketing concerns. Marketing has a vested interest in ensuring that the organisation is able to offer this "service" to customers. Rather than dealing with technical personnel as support staff, these personnel should be viewed as major players in developing and maintaining profitable long-term relationships with customers. A supplier’s skill in utilising and adapting technology is not simply the means for producing better or cheaper end-products: it is an important competitive tool that contributes to value leadership and competitive advantage. Marketing must determine how to best leverage and communicate this skill. (Simons 1994). Situation-specific tactics, such as message strategies in marketing communications, team selling approaches, and a general shift from a product focus to a more robust value added focus all come into play.

Creating a successful product requires identifying market needs and translating them into a product vision and scope, which are executed by following sound project management principles. Product management is the role of governing a product from its inception to delivery to generate the greatest
possible value to the business. Requirements are the basic building blocks gluing together different phases of the product life cycle—the sum of all activities needed to define, develop, implement, build, operate, service, and phase out a product and its related variants (Ebert 2006). Before the development stage it is reasonable to assess customer needs and other information on other vague ideas must to be collected and analysed. Some of the development processes start from a clear customer need, others start because there is a need to develop an updated version of a product.

### 3.2.2 Software product lifecycle models

According to Hoch et al. (1999), 84 percent of all software development projects do not finish as planned, and more than 30 percent are cancelled before completion. Software companies that have excellent processes, such as very clear team structures, extensive stakeholder involvement, “daily builds”, and software reuse, largely reduce the frustration felt by programmers. These processes make the work more enjoyable as boring reworks and bug detection are reduced. At the same time, the product quality increases and the time to market shrinks. Software development processes are largely researched and they could be divided into the following processes: sequential development (waterfall), iterative development (spiral model, win-win spiral model), community-based development (open source), and agile development.

According to Salo (2006) agile software development has challenged the traditional ways of delivering software as it provides a very different approach to software development. In recent decades, software process improvement (SPI) has been widely studied in the context of traditional software development, and its strengths and weaknesses have been recognised. As organisations increasingly adopt agile software development methodologies to be used alongside traditional methodologies, new challenges and opportunities for SPI are also emerging. One challenge is that traditional SPI methods often emphasise the continuous improvement of organisational software development processes, whereas the principles of agile software development focus on iterative adaptation and improvement of the activities of individual software development teams to increase effectiveness.

Process models for software development describe the framework for the different activities needed to produce software. A formal description of the generic life cycle processes for software can be found in the ISO/IEC 12207 standard.
This is a common framework for creating and managing software from the conceptualisation of ideas and definition of requirements to the software’s retirement. In addition to development, this standard also contains the activities involved in the operation and maintenance of a software product. The standard groups the life cycle activities into primary processes, supporting processes, and organisational processes.

There are five primary processes: acquisition, supply, development, operation, and maintenance. The development process defines the activities of the organisation that defines and develops the software. These are the core activities needed to produce new software. The five primary processes are supported by documentation, configuration management, quality assurance, verification, validation, joint review, audit, and problem resolution processes. Of these, quality assurance is particularly important, since it defines the activities for assuring that the software is in conformance with the specified requirements and plans. Verification, validation, joint reviews, and audits may be used as techniques in this process. Outside the development project there are four organisational processes. The management process defines the activities of the management, including project management of the development project.

The infrastructure process defines the activities for establishing an underlying structure for the other processes. The improvement process defines the activities for establishing, measuring, controlling, and improving the other processes. Finally, the training process defines the activities for providing adequately trained personnel. (ISO/IEC 12207)4.

Software projects utilise a process to enable execution of the engineering tasks to achieve the goal of delivering a software product that satisfies the user requirements. Processes utilised so frequently conform to a process model—a general process structure for the life cycle of software development. A process model generally specifies the set of stages in which a project should be divided, the order in which the stages should be executed, and any other constraints and conditions on the execution of stages. (Jalote et al. 2004).

The Waterfall Model is one of the most influential and commonly used processes. In it the different phases of requirements specification, design, coding, and testing are performed in sequence. The waterfall model as a linear sequence of stages became the most influential process model—it is conceptually simple and

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s contractually somewhat easy to administer (e.g. each stages can be defined as a milestone at which some output is obtained and some payment is made). (Jalote et al. 2004).

The biggest drawback with the waterfall model is that it assumes that requirements are stable and known at the start of the project. Unchanging requirements, unfortunately, do not exist in reality, and requirements do change and evolve. Another key limitation is that it follows the “big bang” approach – the finished software is released in one shot at the end and no operating system is delivered until this occurs. This clearly entails heavy risks as users do not know what they are getting until the very end. (Jalote et al. 2004).

The waterfall model has been complemented by the ideas of more iterative and incremental development (Boehm 1988, Jacobson et al. 1999), which still contain the waterfall model as a similar sequence of steps in each of the possible development cycles. However, the traditional software life cycle processes have been complemented by a new, user-centred approach called ISO 13407\(^5\), the standard for human-centred design processes for interactive systems that focus on systems usability. Wallin et al. (2002) use the life-cycle phases defined in Microsoft’s Synch-and-Stabilise Life-Cycle, the Unified Software Development Process, and Extreme Programming as examples.

These models are commonly known, and their lifecycle phases cannot be confused with software development activities such as analysis, design, implementation, verification, and validation, as described in the traditional waterfall model. Moreover, the names of these three phase approaches indicate the product’s maturity rather than the development activities performed.

Another classic approach is The Spiral Model presented by Boehm (1988), which is a situation-dependent, risk-driven approach to software development. Software is developed iteratively in cycles with the same sequence of steps but with differing emphasis. The spiral is initiated by a hypothesis concerning the new software, and the whole spiral process is a kind of test of this hypothesis.

At any time, if the hypothesis fails the test (for example, if delays cause a software product to miss its market window, or if a superior commercial product becomes available), the spiral is terminated. (Boehm 1988).

Boehm’s Spiral Model of software development begins each cycle of the spiral by performing the next level of elaboration required to meet the prospective

system’s objectives, constraints, and alternatives. A primary difficulty in applying the spiral model has been the lack of explicit process guidance in determining these objectives, constraints, and alternatives. (Boehm & Bose 1994).

The Win-Win Spiral Model is based on the spiral model and has been extended using Theory W (win-win), a management theory and approach, with an emphasis on making the key stakeholders “winners”. (Boehm et al. 1998)

The collaborative nature of the Win-Win Spiral Model makes it successful in situations with rapidly changing technology, many candidate approaches, little user or developer experience with similar systems, and the need for rapid completion. The model has three main strengths; 1) Flexibility. The model allows the teams to adapt to accompanying risks and uncertainties, such as a rapid project schedule and changing team composition; 2) Discipline. The model’s framework was sufficiently formal to maintain focus on achieving three main, or “anchor-point”, milestones: the life-cycle objectives, the life-cycle architecture, and the initial operational capability; and 3) Trust enhancement. The model provided a means for building trust among the project stakeholders, enabling them to evolve from adversarial, contract-oriented system development approaches toward methods that were mutually supportive and cooperative. (Boehm et al.1998).

The Win-Win Spiral Model adds three front-end activities to each cycle: identify the system or subsystem’s key stakeholders, identify the stakeholders’ win conditions for the system or subsystem, and negotiate win-win reconciliations for the stakeholders’ win conditions. The purpose of these activities is to allow the model to determine the mutually satisfactory key objectives, alternatives, and constraints. The original spiral model uses a cyclical approach to the development of increasingly detailed elaborations of a software system’s definition, culminating in incremental releases of the system’s operational capability. Each cycle involves four main activities:

- Elaborate the system or subsystem’s product and process objectives, constraints, and alternatives;
- Evaluate the alternatives with respect to the objectives and constraints. Identify and resolve major sources of product and process risk;
- Elaborate the definition of the product and process;
- Plan the next cycle, and update the life-cycle plan, including partition of the system into subsystems to be addressed in parallel cycles. This can include a
According to Rajlich & Bennett (2000), software engineers have traditionally considered any work carried out after initial delivery as simply software maintenance. Some researchers have divided this work into various tasks, including making changes to functionality (perfective), changing the environment (adaptive), correcting errors (corrective), and making improvements to avoid future problems (preventive). However, most software engineers have considered maintenance to be uniform over time. They describe a new view of the software life cycle in which maintenance is actually a series of distinct stages, each with different activities, tools, and business consequences. The software life cycle consists of five distinct stages:

- **Initial development.** Engineers develop the system’s first functioning version;
- **Evolution.** Engineers extend the capabilities and functionality of the system to meet user needs, possibly in major ways;
- **Servicing.** Engineers make minor defect repairs and simple functional changes;
- **Phase-out.** The company decides not to undertake any more servicing, seeking to generate revenue from the system for as long as possible;
- **Closedown.** The company withdraws the system from the market and directs users to a replacement system, if one exists;
- The versioned staged model for the software life cycle emphasises the evolutionary nature of software development (Rajlich & Bennett 2000).

During initial development, engineers build the software to satisfy the initial requirements. This stage is well-documented in the literature using tools and methods. If initial development is successful, the software enters the evolution stage, when iterative changes, modifications, and deletions to functionality occur. Evolution partly results from the learning process. Customer demands for additional functionality and competitive pressures also cause evolution. In some domains, evolution may respond to legislative action or to changes in business practice or the operating environment. Sometimes companies release software immediately after initial development, but most often the software is released during evolution and certainly after the software has gone through several internal iterations to address glaring deficiencies and to ensure a stable fault rate. To evolve easily, software must have both an appropriate architecture and a skilled
development team. When these are lacking, the software enters the servicing or saturation stage when it is considered to be ageing, decayed, or legacy. During this stage, changes are both difficult and expensive, so developers minimise them or offer them as wrappers, which are simply modifications to inputs and outputs, leaving the old software untouched. During the phase out or decline stage, the company undertakes no additional servicing and tries to generate revenue, or other benefits, from the unchanged for as long as possible. People may still use the software, but with no changes made, it becomes increasingly outdated, and users must work around its deficiencies. It becomes difficult to return to the previous servicing stage because of the growing backlog of change requests. During the final closedown stage, the company shuts down the software and directs users towards a replacement system, if one exists. Still, the company may have residual responsibilities, such as source code retention and legal liability, which are particularly important in areas such as outsourced software, where there are contractual obligations. In some companies, management of key organisational data is crucial and dominates software decisions. As a system moves from phase out to close down, managers must carefully plan and organise migration of data to a new system. (Rajlich & Bennett 2000).

Transitions from one stage to another can result from deliberate business decisions that are made by default or mistake. Managers must be conscious of the enormous business consequences of unintentional transitions and be aware of their symptoms so they can halt or reverse them while there is still time. Managers should also understand that attempts to return to previous stages or to deal with software as if it is in a previous stage could be both expensive and risky. Customers should know what stage software is in and should explicitly ask for this information before buying it. They should avoid any software in the advanced servicing stage because the software is unlikely to evolve with the user’s needs, and closedown is probably near. (Rajlich & Bennett 2000).

Software development continues throughout its lifecycle and by taking different actions it is possible to lengthen the lifecycle. At the some point, the company needs to shift its emphasis and resources away from building a current platform toward developing a new platform. The timing on this shift is an element of strategic balance. If a company shifts too soon, it fails to get as much as it should from its current platform. (McGrath 2001).

According to Hoch et al. (1999), user involvement is the most important success factor in a software development process. Lack of end-users’ buy-in can lead to total project failure. Furthermore, during the project customers have to
make many decisions that impact schedule, costs, or functionality. Customers who are closely involved better understand the implications of their decisions, and they usually make faster and better decisions: they have more realistic expectations and understand trade-offs between additional features, costs, and time. Therefore, it is crucial to evaluate all results during the product development process, which ultimately leads to an iterative development process. A pure waterfall approach to software development makes introducing usability techniques fairly impossible. (Ferre et al. 2001).

Agile software development methods, “officially” started with the publication of the agile manifesto, make an attempt to bring about a paradigm shift in the field of software engineering. Agile methods claim to place more emphasis on people, interaction, working software, customer collaboration, and change, rather than on processes, tools, contracts, and plans. The software development is agile, if it is incremental (small software releases, with rapid cycles), cooperative (customer and developers working constantly together with close communication), straightforward (the method itself is easy to learn and to modify, well documented), and adaptive (able to make last moment changes). (Abrahamsson et al. 2002).

Further, Dyba & Dingsour (2008) have done systematic review to evaluate, synthesize, and present the empirical findings on agile software development. According to them many of the suggestions for improvement have come from experienced practitioners, who have labelled their methods agile software development. This movement has had a huge impact on how software is developed worldwide. However, though there are many agile methods, little is known about how these methods are carried out in practice and what their effects are.

3.2.3 Focus on users and usability

In this study, rather than just focusing on the process, usability is considered because theories define the user’s role as being that of an active partner. The development process is iterative and it takes into account the attributes of the product, especially from the user’s perspective. The idea is close to value creation, in which both actors reach common benefits. According to Karat (1997), user centred design is an iterative process whose goal is the development of usable systems, achieved through the involvement if potential users of a system in system design.
Further, according to ISO 9241\(^6\) Part 11, usability is

“The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use.”

The main reason for applying usability techniques when developing a software system is to increase user efficiency and satisfaction and, consequently, productivity. Usability techniques, therefore, can help any software system reach its goal by helping the users perform their tasks. Furthermore, good usability is gaining importance in a world in which users are less computer literate and can’t afford to spend a long time learning how a system works. Usability is critical for user system acceptance: If users don’t think the system will help them perform their tasks, they are less likely to accept it. It’s possible they won’t use the system at all or will use it inefficiently after deployment. If we don’t properly support the user task, we are not meeting user needs and are missing the main objective of building a software system. (Ferre et al. 2001).

For a software development organisation operating in a competitive market, failure to address usability can lead to a loss of market share should a competitor release a product with higher usability. Also, a software product with better usability will result in reduced support costs (in terms of hotlines, customer support service, and so forth). Even if a system is being used, it does not necessarily mean it has a high level of usability. There are other aspects of a software product that condition its usage, such as price, possibility of choice, or previous training. (Ferre et al. 2001).

According to Damodaran (1996), a variety of studies show that effective user involvement in system design yields the following expected benefits:

- Improved quality of the system arising from accurate user requirements;
- Avoidance of costly system features that the user did not want or cannot use;
- Improved levels of acceptance of the system;
- Greater understanding of the system by the user resulting in more effective use;
- Increased participation in decision-making within the organisation.

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According to Kujala (2003), the list is somewhat participatory design-focused, it aptly illustrates the underlying assumptions regarding the benefits of user-centred design and usability engineering. For example, Gould et al. (1987) report their findings on the benefits of user-centred design as: extra effort in the early stages leads to much less effort later on and a good system at the end. Also Nielsen (1993) states: users often raise questions that the development team has not even dreamed of asking. This is especially true with respect to potential mismatches between the users’ actual task and the developers’ model of the task.

The principles presented by Gould & Lewis (1985) are generally well accepted. The principles are: early focus on users and tasks, empirical measurement, and iterative design. Gould & Lewis recommend bringing the design team into direct contact with potential users, as opposed to hearing and reading about them through human intermediaries. The second principle implies that, early in the development process, intended users should use simulations and prototypes to carry out real work, and their performance and reactions should be observed, recorded, and analysed.

Early involvement of users appears to be promising, on the condition that user involvement methods are developed further and the roles of users and designers are carefully considered. Designers should take an active role in user involvement. Users are experts in their own field, but they do not need to be experts on design. Field studies are a particularly promising approach for understanding users’ implicit and non-verbal needs. Users are not only asked about their needs, but the analysts try to understand their behaviour and the future context of use. Users may not be able to communicate their precise requirements, but they are able to explain their goals and how they approach their tasks. Using this kind of information a designer can work out, on behalf of the users, the solution they need. Contextual inquiry and ethnographic methods seem promising, but challenges exist in the use and analysis of the huge amount of raw data collected. (Kujala 2003).

Large product development organisations have consciously insulated developers from customers, delegating customer contact to marketing, customer support, field service, training, and other specialists. This policy may be beneficial when developing products with little or no human-computer interface, but those benefits become obstacles to carrying out structural or procedural changes to promote user involvement in interactive system development. Also, some people fear that by exposing features and functionality that are under development, user involvement can discourage customers from buying the current
product version, create false expectations if the features are not implemented, risk legal rights to software patents, and give competitors information about product plans. Obtaining access to users can require the need to overcome these concerns. (Poltrock & Grudin 1994).

Iterative design faces unique problems due to the visibility of the interface—changes are very evident to many people—and due to the dependence of the integrity of the interface design on a range of people involved in hardware, software, documentation, training development, marketing, and other professions. Software interfaces are the foci of training, user documentation, and marketing campaigns, so changes impact other people. While user feedback should insure that iterations will lead to improvements, the very concept is not easily accepted in engineering environments conditioned to stress the importance of thorough up-front design. Prototyping and user testing are integral parts of interface design and development practices. Interfaces and their prototypes are constructed using tools built into the product that permit changes to the appearance and to some behaviours of the interface. (Poltrock & Grudin 1994).

Nielsen (1992) presents the Usability Engineering Model, which is a modified and extended version of Gould & Lewis’s (1985) “golden rules” that include: an early focus on users, user participation in the design, coordination of different parts of the user interface, empirical user testing, and iterative revision of designs based on test results. Further inspiration and modifications came from work on usability engineering. The most basic elements in the model are empirical user testing and prototyping combined with iterative design.

Nielsen (1992) divides usability activities for three main phases of a software project: before, during, and after product design and implementation. The constraints of the print medium necessitate a sequential presentation of these usability activities, even though they should really be applied iteratively in the manner of Boehm’s spiral model of the software process. Usability should apply to the development of entire product families and extended projects where products are released in several versions over time.

The first stage of the usability life cycle aims at understanding the target user population and user tasks. There is no need to rush into design. The least expensive way for usability activities to influence a product is to do as much as possible before the design starts. Doing so reduces the necessity to change the design to comply with the usability recommendations, and it may be possible to avoid developing unnecessary features. The main objective of the design phase is to arrive at a usable implementation that can be released. For this to happen, it has
to meet two further objectives: getting a concrete embodiment of the design in a prototype that follows established usability principles, and empirically verifying the design with real users to ensure that it meets their needs. *The main objective of usability work after a product release is to gather data for the next version and for new products in the future.* In the same way that existing and competing products were the best prototypes for the product in the initial competitive analysis phase, a newly released product can be viewed as a prototype of future products, and in most cases it is certainly becomes the prototype of its own next release. (Nielsen 1992).

### 3.2.3 Summary

Software product creation is based on the work of large teams of specialists. This kind of work demands open communication and co-operation between teams. Market knowledge has to be translated into a product vision and scope. Process models for software development describe the framework for the different activities needed to produce software.

Software projects utilise a process to enable execution of the engineering tasks to achieve the goal of delivering a software product that satisfies the user requirements. Processes so frequently utilised conform to a process model—a general process structure for the life cycle of software development. A process model generally specifies the set of stages in which a project should be divided, the order in which the stages should be executed, and any other constraints and conditions on the execution of stages. (Jalote *et al.* 2004).

With iterative development, the release cycle becomes shorter, which reduces some of the risks associated with the “big bang” approach. Requirements need not be completely understood and specified at the start of the project—they can evolve over time and can be incorporated in the system in any iteration. Incorporating change requests is also easy as any new requirements or change requests can be simply passed on to a future iteration. Overall, iterative development is able to handle some of the key shortcomings of the waterfall model, and is well suited for the rapidly changing business world, despite having some of its own drawbacks (e.g. it is difficult to preserve the simplicity and integrity of the architecture and the design). (Jalote *et al.* 2004). The development can “stock” iterations and the process can become more complex than it is meant to be.
The commonly used iterative development approach is organised as a sequence of iterations, with each of the iterations delivering parts of the functionality. Though the overall delivered functionality is delivered in parts, the total development time is not reduced. (In fact, it can be argued that if the requirements are known then for the same amount of functionality, iterative development takes more time than a waterfall model). If we wish to reduce the total development time, a natural approach would be to employ parallelism between the different iterations. That is, a new iteration would commence before the system produced by the current iteration is released, and hence the development of a new release occurs in parallel with the development of the current release. (Jalote et al. 2004). A software product can be in use before it is even completed.

When the issue is early user involvement and the user’s role in testing products, it is also worth noting that product use starts long before any contract is made. The product can be installed in a customer’s organisation and be used before product purchase decision has been made. In this kind of situation, the period of product use is extended. This period is important, especially when evaluations are made, because they are based on cumulative experiences. This gives customers knowledge of the development process of the product, and entrenches customers in co-operation. This also means that the period in which the use value is created is longer than normal, and the customer plays a part in constructing the value offering. The value offering becomes more focused on common benefits and mutual understanding.

### 3.3 Users and use

In this section, the focus is on the software product’s users and the period of software use. Software product development is dependent on the early user contacts. This supports the idea of co-operation and the actors’ role as value co-creators. This also means that relationships become deeper far sooner than in traditional cases. Trust and involvement in the development process are demanded, and that is why suppliers are willing to involve customers in the use of the product.

No-one has answered the question ‘why does the firm exist?’ more clearly or succinctly than Peter Drucker (1973): to satisfy the customer is the mission and purpose of any business. Customer satisfaction is achieved when superior customer value is delivered by the business. Firms do not exist to reduce
transaction costs or maximise profits. Firms exist to provide a product or service because it is neither efficient nor effective for buyers to attempt to satisfy all their needs themselves. (Slater 1997).

The following subsections are focused on how to get a software product in to use. The value offering is based on the best available knowledge at a moment in time. If customers are capable of stating exactly what they need, it becomes easier to provide a focused product that meets their needs. Using software is a dynamic process, because the product’s attributes are easy to change. When needs change, the offered attributes also change. A software product is dependent on service, because software products require installation, training, and updates if they are to work properly. The strength of relationships helps support the actions taken and the subsequent reactions. As mentioned earlier, a customer buys a value offering, not simply a product.

3.3.1 Supplier’s value offerings

Customers are very demanding and generally demand ever-increasing levels of quality and service with lower costs. More specially, markets have fragmented into numerous segments, each with its own value equation (Day 1994). One way to estimate the number of customers or the amount of segments is to use a technology adoption life cycle model (Rogers 1995) as a tool. Understanding the needs of customers requires knowledge, which is based on making early connections with customers and on the capabilities to analyse that knowledge. This kind of knowledge should be a base for the offerings made. Every customer segment needs its own offering, but in practice, every customer needs their own. How can a perfect offering be created? At the very least, it has to be based on knowledge.

A market orientation is manifested by the development of firm skills for acquiring knowledge about customers and other market participants, sharing that knowledge widely throughout the organisation, achieving consensus on its meaning, and taking action to deliver superior customer value (Day 1994, Kohli & Jaworski 1990, Slater & Narver 1995). An important distinction is that the objective is to learn about customers, not just learn from customers. Although maintaining a constant formal and informal dialogue with customers is important, there are other ways to learn about customers and their needs. For example, the firm can learn by conducting market experiments and by carefully evaluating the result of those experiments. It can learn from others, including consultants,
universities, alliance partners, or suppliers that have an insight into latent customer needs and technologies for satisfying those needs. Finally, a firm can learn from experience, continuously making improvements in the way it does repetitive tasks. Slater & Narver (1996) suggest that each of these learning styles make a unique contribution to organisational effectiveness.

A firm's value offerings are those that customers assess and utilise to achieve their consumption goals (e.g. Woodruff 1997). Specifically, customers perceive value based on their judgment of the trade-off between “what they get” (perceived benefits, quality, or performance) and “what they give”. Through the eyes of customers, value can include product utility (Zeithaml 1988), perceived benefits over the costs (Christopher 1996), market-perceived quality adjusted for the relative price (Gale 1994), and perceived benefits over sacrifices (Eggert & Ulaga 2002). As such, the substantive differences regarding the customer value concept may lead to limited application of the concept in the practice of managing firms toward superior value-creation processes (Woodruff 1997). Value built into the product means that customers’ own value expectations are noticed and the value offering is based on them. Suppliers learn from experiences and their customers and also use other information sources.

3.3.2 The role of users

“Knowing customers makes it easier to understand their needs.” Developers then build software to meet those requirements. After seeing the software, the users often say, “That’s not quite it … change this to that.” The developers then often respond: “You’re changing your requirements. That’s going to delay the project.” Although asking users what they want might seem like a good thing, in the end, we only understand their guesses regarding the tool they need built. We still don’t understand much about them or how they intend to use the tool to solve problems or achieve goals. (Patton 2007).

Patton (2007) discussed how a development organisation, which had always directly involved its users, found that users didn’t actually like the applications they had described. The organisation then realised it had to change how it involved users—to treat them as experts in what they knew and the organisation’s software developers as experts in software design and development. This meant the developers had to watch their users work with the software and ask them about how they worked and what their goals were. The development organisation then prototyped the software that their users could test to see if it met their
objectives. The result was software with higher adoption rates. Experience also shows that it is not advisable to involve the users in the design process by showing them abstract specifications documents; they do not understand documents nearly as well as concrete prototypes. (Nielsen 1992).

Building useful software relies on understanding users, their goals, and their problems, and on determining the software that will help them reach those goals and solve those problems. User centricity isn’t just about caring about users or asking them what they want. It is about understanding them and collaborating effectively with them to help them make informed choices about what software to build. (Patton 2007). This kind of understanding demands involvement in the common goals and requires fitting processes to work together; both are possible in a close relationship. Informing customers about choices means that customers are not always very aware of that they really want, so informing them provides the scope to instruct them in the desired direction. Engler (1996) provides a step-by-step approach to how user involvement can be obtained:

- Identify the correct user; clearly identify the user base. Structure a plan for gaining customer feedback and customer input.
- Involve the user early and often; get the user to commit to the ownership of the project for its entire life cycle, including development, implementation, and maintenance. Motivate and educate the user. Negotiate with the user regarding the roles and responsibilities of ownership. Listen to the user’s expectations. Assign a facilitator or liaison.
- Create and maintain a quality relationship; lay the ground rules for effective teamwork. Make an effort to understand the user’s business. Define a method for managing mutual expectations. Hold regular progress meetings and publish quality metrics.
- Make improvements easy; learn user language. Proactively solicit the users’ opinions and show that they make a difference. Make sure there is a demonstrated benefit for user involvement.

From a customer value perspective, a commitment to generating intelligence from experience may uncover opportunities for improving the quality of customer relationships. For example, the most painful but potentially most enlightening experience is that of losing a customer or even losing a portion of a customer’s business. Long-time customers tend to produce more revenue for the business and are more profitable because of lower selling expenses. The value of a loyal customer base is well accepted, so it is very important that customer defections
are recognised and the reasons for them understood. This experiential process enables the organisation to take appropriate corrective action to prevent additional customer defections. In this way, a continuous improvement philosophy can pay off in building strong customer relationships as well as improving production processes. In a turbulent environment with short product life cycles, experience is likely to have a greater influence on customer relationships than on product cost. (Moore 1995). The challenge is to continuously generate new intelligence about customer needs and how to satisfy them (Slater & Narver 2000).

3.3.3 The role of relationships during use

Dwyer et al. (1987) present a framework for relationship development, which characterises the process moving through four interrelated phases: awareness, exploration, expansion, and commitment. Researchers argue that these relationship phases explain relationship processes, behaviours, and orientations, with various aspects of exchange producing systematically different effects over time (Dwyer et al. 1987, Wilson 1995)

- In the awareness phase, buyers unilaterally recognise a set of potential suppliers with whom they may conduct business.
- In the exploration phase, buyers begin to test suppliers by negotiating contract terms, setting product specifications, and placing small orders to determine if further relationship development is worthwhile.
- In the expansion phase, buying firms make multiple purchases from suppliers or negotiate long-term contracts, and decide to seek benefits from current exchange partners rather than from alternate suppliers.
- In the commitment phase, both buyers and sellers implicitly or explicitly pledge to establish stable relationships. They express a willingness to make sacrifices to maintain their relationships and a confidence in the continuity of the relationships. (Dwyer et al. 1987).

Importantly, relationship development occurs as an ongoing process, and no distinct hurdles specifically identify movement from one phase to another; however, the theory of relationship development offers a model that explains how firms establish, develop, and maintain relationships (Claycomb & Frankwick 2008). Interdependencies between firms increase when both the buyer and seller approach the relationship with a strategy of cooperation—both are willing to establish a long-term relationship, to exchange information openly, and to trust
each other (Campbell 1985), because they see the relationship itself as having value that extends beyond the products exchanged (Grönroos 2004).

In fact, a vital item of information that a supplier must know about its customers is not just the core need that a customer expects the offered product or service to fulfil but, in addition, how that customer perceives the purchase will contribute to the generation of value for it. A supplier must guard against developing a product offering on the presumption that what it thinks denotes value is a view shared by the customer. (Blois 2004).

### 3.3.4 Exchanges

_A product is a bundle of attributes_ made up of the total package of benefits, which includes the functional utility of the goods, the product service that the manufacturer provides, the technical service given to customers, and the assurance that the product will be delivered when and where it is needed and in the desired quantities (Corey 1975). Exchange is another central marketing concept. The concept emphasises the fact that there are at least two parties to a transaction and that all parties have to believe that, over time, they are benefiting from the exchange. There are two important points; first, all parties considering entering into an exchange will have a “wants list”. These lists will be different for each party and will reflect the fact that exchanges are “multiplex” (Aldrich & Whetton 1981), because organisational actors, at a given point in time, transact for a variety of reasons and exchange different contents (Sydow 1998).

In much of the marketing literature, the dominant concern is the supplier’s offering. Yet the exchange concept stresses that the customer’s offering is also critically important and thus all parties to an exchange are consumers. For example, customers do not just offer to pay for an item – they can offer to do so in different ways, each of which has different degrees of attraction to the seller. Thus a customer may offer to pay in full within 30 days of delivery, or a deposit when placing the order and the remainder in a series of instalments over a period of months; such alternatives are not all equally attractive to either the customer or the seller. Individual customers may also offer a potential supplier a range of different benefits. Thus, _as well as alternative ways of paying, a customer might offer the supplier elements such as status and technical insights_. The fact that the selection of customers, (which in the case of marketing to organisations can mean the selection of individual customers) is a central marketing concept that emphasises this viewpoint. (Blois 2004). However, any action, which increases a
customer’s perceived value must not decrease the supplier’s perceived value - otherwise the action is not worth pursuing from the supplier’s point of view. There must be a \textit{win/win exchange} of sacrifices and benefits. Sometimes items appear in the same category for both the supplier and customer and this may indicate the possibility of a mutually beneficial transfer of sacrifices or benefits between them. (Blois 2004).

Finding common understanding demands open dialogue and several negotiations. This pre-use phase takes a lot of time, money, and patience. Customers often buy a basic product, which can be supported with service. In any case, the relationship starts before the product is employed. During the relationship it is easier to meet a customer’s requirements, especially if the customer takes part in the development process. Training is required before the product is actively in use. A product in use still requires support and updates and the process stays active until the product is no longer in use and until a form of the new version is available. At the same way, costs increase during the product’s usage and total ownership costs are about more than just price.

Social exchanges become important during the process. Interaction consists of several acts between different levels and different actors. \textit{Adaptive behaviour} in buyer-supplier relationships can be usefully, and simply, conceptualised in terms of the motivation causing one or other party to adapt, the process by which the adaptation is brought about, and the outcomes of the behavioural process (Brennan 1998). Developing buyer-supplier relationships in the right way requires an understanding of the adaptations which two firms engaged in a long-term relationship implement for each other. It is to be expected that the levels of trust and commitment will influence adaptive behaviour, and that adaptations, in turn, will “feedback” into increased trust and commitment. (Brennan & Turnbull 1999).

\textit{From an interaction perspective, time plays a key role in explaining and understanding exchange}. Buyers and sellers actively consider the past to forecast the likely outcomes of future exchanges. (McLoughlin & Horan 2002). For example, during the awareness phase of relationship development, buyer uncertainty with potential supplier selection decisions emerges because of a lack of information about new exchange partners. In the exploration phase, a buyer’s lack of experience with a potential partner should result in increased buyer uncertainty associated with supplier non-performance. Reducing uncertainty is a central goal in the exploration phase. (Jap & Ganesan 2000). In the expansion phase, buyer uncertainty begins to decrease because the relationship has evolved significantly from one that is characterised by probing and testing, to one
characterised by reciprocity and a continual increase in the rewards that partners supply one another. The exchange structure emerging during expansion builds on satisfactory past performance. (Dwyer et al. 1987). Trust grows based on a belief that there is mutual benefit for each partner in cost-benefit exchange tradeoffs (Scanzoni 1979). In the commitment phase, buyers perceive low uncertainty, despite the high level of risk associated with non-performance and the tremendous exposure to opportunism, because past performance induces confidence that suppliers will provide consistent future performance (Larson 1992).

Likewise, the type and level of relationship-specific investments change during the relationship development process, with trading partners gradually increasing their dedication to a relationship through relationship-specific investments in, for example, processes and equipment (Selnes 1998). For example, during the awareness phase, little or no relationship-specific investments occur because this phase takes place prior to relationship formation. In the exploration phase, relationship-specific investments emerge as a buyer makes initial adaptations that are necessary to begin conducting business with a specific seller. In the expansion phase, relationship-specific investments increase and create interdependence in a relationship, and signal dedication to relationship development because of the economic consequences a buyer would incur with the end of a relationship. (Ganesan 1994). In the commitment phase, relationship-specific investments level off because the investments made in the earlier phases are sufficient to instil confidence (Wilson 1995). A buyer's switching costs in this phase are extremely high, and a buyer will change partners with great reluctance. Typically, customers must be unsatisfied for a long period of time before they are driven to change their supplier.

### 3.3.5 Software use

Hoch et al. (1999) identify a number of reasons why users start using software; the ability of programmes to operate together and exchange information is critical; thus people buy software that is the same as the one they usually communicate with. Users enjoy increasing returns from their software as other users also begin to use it. Once users are trained on certain software products, they are less likely to switch to others because this would necessitate retraining. Since software products are often difficult to evaluate objectively, decision makers often buy
whatever is most popular. In practice, customers evaluate a variety of offerings and select the best combination of product attributes, service, and relationship.

Value is the perceived worth of a product or service compared to what was paid and taking into account the lost opportunity cost. The perception of value is formed through all the experiences a customer has throughout a product’s lifecycle. The value experience starts with the initial choice and continues through ordering, installing, learning, using, supporting, and finally disposing of the product. (Goodwin & Ball 1999). The initial decision considers complete solutions that increase productivity and throughput. Ordering includes the availability of a product when it is needed. Installing relates to the out-of-the-box experience. Learning corresponds with easy-to-use documentation and training. The use stage encompasses quality, reliability, and the level of increased throughput. Supporting means that the product can be repaired quickly. Disposing includes the upgradability option.

Within each of these experiences, and depending on the customer’s needs, a few key “moments of truth” (or disproportionately important interactions) drive the customer’s perception of value and subsequent purchase decisions. Customer value management is about understanding the “portfolio value” that appeals to targeted customers, so that the focus can be on critical value drivers. The goal is a short list of manageable items that will significantly impact the bottom line. Through a strong understanding of what customers value, companies will know how to offer better value than the competition at the same cost, or comparable value at a reduced cost. The end result of a strategy centred on delivering superior value will be increased customer loyalty and profitability. (Goodwin & Ball 1999).

Repeat purchases and a willingness to continue the relationship characterise customer loyalty (Goodwin & Ball 1999). While most companies already measure customer satisfaction in some form, that measure doesn’t predict customer loyalty. Customer satisfaction is an attitude. High levels of customer satisfaction do not necessarily translate into repeat purchases or increased sales and profits. Customer loyalty is a measurement that is directly tied to repeat purchase behaviour. (Goodwin & Ball 1999). According to Goodwin & Ball’s (1999) research, loyal customers:

- Stay longer;
- Cost less to service;
- Provide higher margins;
- Purchase across product lines;
- Buy more;
- Demonstrate immunity to the competition;
- Demonstrate less price sensitivity.

Along with directly measuring what drives customer loyalty, a systematic way to collect, collate, and analyse the verbatim responses of customers and non-customers is required. Qualitative listening posts complement the quantitative data to provide an important “word on the street” view about what customers think. These listening posts can include customer call-centre data (pertaining to sales, service, and support), online requests (via email and Internet), sales call reports, customer and non-customer interviews, and focus groups. (Goodwin & Ball 1999).

The inherent interdependencies in buyer-seller relationships naturally result in conflict (Mohr & Spekman 1994). Polarisation and isolation may result from destructive conflict. However, total suppression of conflict can result in a relationship that loses vitality and fails to fully develop (Dwyer et al. 1987, Lam & Chin 2005). In relationships characterised by a desire to establish and maintain long-term, collaborative efforts, managers favour productive conflict resolution mechanisms because of their less volatile nature. Productive mechanisms contribute to a relationship, strengthen each firm's identification with one another, and increase cooperation. Over time, the use of productive strategies results in each firm's programmes, policies, and behaviours becoming more predictable and focused on conducting a relationship in an interdependent rather than independent fashion. (Gundlach & Cadotte 1994). Firms developing long-term, collaborative relationships engage in joint problem solving because integration more fully satisfies the needs and concerns of both parties. Joint problem solving to resolve conflict results in mutually satisfactory solutions, and thereby enhances relationship success. (Mohr & Spekman 1994). Productive strategies bring issues and grievances to the surface, increase interdependence, reduce residual conflict, and foster a win-win solution for both partners in a relationship (Gundlach & Cadotte 1994).

Firms may also use destructive conflict resolution mechanisms such as harsh words, arbitration, domination, smoothing, and avoidance. However, firms generally do not internalise changes brought about by these types of conflict resolution mechanisms. Even though destructive mechanisms can solve short-term difficulties they tend to exacerbate the fundamental issues of a conflict. These techniques undermine a relationship's goal of mutual gain and the proactive
tone of a long-term buyer-seller relationship where the problems of one partner are in effect the problems of both partners. (Mohr & Spekman 1994).

The changes in buyer uncertainty and relationship-specific investments experienced during the course of a developing relationship imply that the associations between relationship characteristics (i.e., relationship-specific investments and buyer uncertainty) and interaction mechanisms (i.e., information exchange and conflict resolution) may vary during the course of a relationship development process. In the awareness phase, there is an absence of personal relationships between individuals involved in a buyer-seller relationship, and little investment in relationship-specific investments (Ford 1980). Because high levels of activity between buyers and sellers generally characterise the exploration and expansion phases, stronger relationships will be found during these phases (Håkansson 1982). By the time a relationship has reached the commitment phase, a pattern of reduced intensity and the withdrawal of key contacts from the relationship becomes apparent. This may be attributable to the stability of the relationship. (Rosson & Ford 1982).

### 3.3.6 Summary

Capabilities are defined as “complex bundles of skills and accumulated knowledge, exercised through organisational processes that enable firms to coordinate activities and make use of their assets” (Day 1994). The supplier’s role is to construct value offerings capable of attracting customers. The easiest way to do this is to use the available knowledge from both internal and external sources. Learning by doing and learning from experiences are important aspects in the process. In practice, this often means that mutual understanding is found as a consequence of made co-operation. A customer’s biggest problem is often that of knowing about and informing the supplier of its real needs. Sometimes customers just don’t have enough technical knowledge to do this. This allows suppliers to guide customers in a desired direction.

Theoretically, the profile of the value offering that encompasses attribute performance, pricing value, relationship building, and co-creation value enables managers to understand what constitutes value and how to assess value in the context of the value-in-offering perspective (Ngo & O’Cass 2009). Relationship building is a consequence of the exchanges between actors. Social relations become a significant asset and they support the relationship’s development. Through the sequence of investments made, changing partners become expensive,
and it is to be avoided if at all possible. The use of a software product and service is an iterative process in which new versions with new attributes are continuously developed. Use of a software product is supported as long as the current version is active but updates stop when it becomes old and obsolete. A new version of the software with new attributes will then become the replacement product.
4 Software oriented collaboration value model

The software oriented collaboration value model is presented in this chapter. Theoretically, this chapter combines all the elements conceptualised in the previous chapters and depicts their relations to each other. The starting point for this model is that the customer and supplier agree to co-operate in order to gain more common benefits and value. From the supplier’s perspective, this means that the focus is on making the period of use as pleasant as possible. In practice, the use period increases as a central part of the value creation process. This chapter starts from the basic elements of the structured model, when it is presented as an a priori model.

4.1 Basic elements

The context of software business is dynamic, technologically innovative, and challenging. Buyer-seller relationships are interactive and the solutions applied are continuously changing, as a result, uncertainty and ambiguity are inescapable. Problems between the supplier and the customer are solved through interactions. Any substantial intervention in a supplier relationship is likely to have a number of rather complicated consequences. Relationships consist of technical, commercial and organisational solutions, and any change in the actual arrangement impacts the costs and benefits for both companies. Some consequences are quite easy to expose, measure, and quantify; others are no less important but are less obvious and are more indirect and difficult to measure. When changes in the degree of involvement are considered, it has to be kept in mind that supplier relationships are two-sided, implying that the input and output of both the customer and supplier determine performance. The interests and resources of both parties must be considered. (Gadde & Snehota 2000). Value can be defined in many ways.

Anderson et al. (1993) have defined value as:

“*The perceived worth in monetary units of the set of economic, technical, service and social benefits received by the customer firm in exchange for the price paid for a product offering, taking into consideration the available suppliers’ offerings and prices.*”
Woodruff & Gardial (1996) define customer value as:

“The customer perception of what they want to happen (i.e., consequences) in a specific kind of use situation, with the help of a product or service offering, in order to accomplish a desired purpose or goal.”

**Focus on use**

Most value creation views recognise, at least implicitly, that customers buy products to satisfy needs in use situations. Typically, these needs are translated into the specific attributes of a product or service and supporting services that targeted customers prefer. Thus, customer value is viewed as the combination of preferred attributes and their performances. This attribute concept of value typically incorporates costs as well. The price of a product can be viewed as an attribute, and most other cost dimensions, such as the complexity of the product operation, can also be incorporated into the attribute value. In this sense, customer value is a trade-off between desirable attributes (desired from the supplier) compared to sacrifice attributes (surrendered to buy and use the product). (Woodruff at al. 1993). This definition is dependent on the product attributes, but it also recognises the benefits of using the product. This sits well in the context of software business because it is still quite technical and service-centric. Software development is ultimately dependent on the information from customers.

New product development needs information about customer needs and preferences, competitors, government regulations and other external factors, in the customers’ industries, and the needs and preferences of the customers’ customers (Biemans & Harmsen 1995). There is a strong need to gather information, which is a base for making decisions. Further, user involvement is the most important success factor in software development processes (Hoch et al. 1999). The main reason for applying usability techniques when developing a software system is to increase user efficiency and satisfaction, and consequently, productivity. Usability techniques can help any software system reach its goal by helping users perform their tasks. (Ferre et al. 2001). The concept of customer value has a strong connection to customer satisfaction, which is based on cumulative use experiences.
Temporal view of value creation

From the customer’s perspective, the important starting point is Woodal’s (2003) longitudinal perspective of value creation. It includes phases such as pre-purchase, at the point of trade or experience, post-purchase (or use), and after use or experience. The goal of the value creation process is to develop customer satisfaction and loyalty. Panasuraman & Grewal (2000a) present the same kind of idea in their four different types of value. In their article, the perceived value component consists of acquisition value, transaction value, in-use value, and redemption value. Figure 4 presents a traditional exchange, where ownership of the product or service changes. The phases in the process are adapted from Woodal’s literature review.

![Fig. 4. Ownership changes at the point of trade or experience.](image)

Joining these two views together forms the basis of the customer value model, which connects the views of suppliers and customer. According to van der Haar et al. (2001), one of the greatest challenges is to incorporate the “voice of the customer” into the design of new products and service. Driven by the realisation that the total solution is what offers value to the customer, technology-based companies are increasingly selling “customer value” instead of products. Customer value is typically a dynamic concept because the perceived value of a product or service may change over time. The drivers that motivate a customer’s initial purchase may differ from the criteria that connote value during use and
right after purchase, which in turn may differ from the determinants of value during long-term use (Woodruff 1997, Day & Wensley 1988, Flint et al. 1997). For instance, as experience with the product increases, the need for service and consulting may decrease. This is different in the software business, because the need for service can increase when the product stays in use. The reason for this being that the product requires updates and maintenance until it is no longer in use, so the service only changes its form. The software is under development during the use period.

According to van der Haar et al. (2001), the customer value model consists of development, purchase, and use phases (Figure 5). The development phase consists of the supplier’s intended and customer’s desired value. The purchase phase is based on the supplier's design and the customer’s expected value. Finally, the use phase consists of received value. Theoretically, the customer’s valuation process continues into a phase called after use or experience. The last phase is a time for the evaluation of what has happened and what the next steps are. This consists of perceived value.

![Fig. 5. Development, purchase, use, and evaluation.](image)

What happens between these phases? How is it possible to move from one phase to another? According to Day (2000), central to every relationship is an exchange process where value is given and received. These exchanges line up along a continuum with, at one end a single transaction and at the other a long-run, two-way collaboration. At the other end of the spectrum, collaborative exchanges feature very close information, social, process linkages, and mutual commitments.
made in expectation of long-run benefits. According to Ford et al. (1997), every new relationship starts from some pre-existing situation, where two actors meet and try to determine the possibilities for doing business with each other. A customer’s perceived value is created, co-produced, and delivered over time as the long-term win-win relationship develops (Gummesson 1999, Ravald & Grönroos 1996).

Interactions, exchanges, and relationships

Product and/or service exchange is usually described as being at the core of exchange (Ford 1997). Prahalad & Ramaswamy (2004a) describe that in co-creation, direct interactions with customers are critical. The attributes of the product and/or service have a significant effect on the relationship. The exchange process as a whole will be quite different, depending on whether or not the product/service is able to fulfil the needs of the buyer. The value offering consists of product-, service-, and relationship-related benefits and sacrifices, or different combinations of these (Lapierre 2000). All these three have an important role in value creation, especially the relationship, because it is also a consequence of interaction.

According to Grönroos (2009) interaction is mutual or reciprocal action where two or more parties have an effect upon one another. The parties involved are in some contact with each other. In a business context supplier-customer interactions mean that two or more parties are in contact with each other for a business reason, and in these contacts they have opportunities to influence one another’s processes. This definition is close the same than in this study. The interaction is a wide process, which includes different kind of exchanges.

Ballantyne & Varey (2006) see that value creation requires interaction. Nevertheless, interaction as a generator of service experience and value-in-use does seem to be treated as a given. They present three linked enablers of exchange and their role in creating value between customers and suppliers, and indeed between any other market actors. First, relationships to give structural support for the creation and application of knowledge resources (relating); second, communicative interaction to develop these relationships (communicating); and third, the knowledge needed to improve the customer service experience, especially when co-created through dialogue and learning together (knowing).

Value exchanges include the flow of information, material, resources, and money. The basic elements of the model are the supplier and customer and the
interaction between them, see Figure 6. During the interaction, a relationship develops and connections become tighter, making co-operation easier.

![Interaction Diagram]

**Fig. 6. Basic elements.**

According to Blois (2002), an exchange occurs between two organisations when resources are transferred from one party to the other in return for the resources controlled by the other party. Further, Blois argues that exchanges should be seen in terms of disaggregation, with the exchange made up of different kinds of attributes, e.g., the physical product, price, payment procedure, and personal contacts, and these attributes are valued differentially by the organising parties. In other words, the organisational parties have their own ‘want lists’ concerning exchanges, and these wants may or may not be fulfilled. Moreover, the want lists of the organisational parties usually vary quite markedly.

In a close relationship, the customer probably shifts the focus from evaluating separate offerings to evaluating the relationship as a whole. The core of the business, i.e. what the company is producing, is of course fundamental, but it may not be the ultimate reason for purchasing from a given supplier (Lapierre 1997). One can also imagine that even if the solution in terms of goods and services is not the best possible one, if the relationship is considered to be sufficiently valuable, the parties involved may still reach agreement (Grönroos 2004). Hutt & Speh (1998) describe the interaction in a deep relationship as being that of a “diamond” shape, where the various value creating functions in partner organisations freely communicate among one another and exchange information and resources in order to achieve relationship objectives. In effect, relationships consist of social networks and even friendships.

The interaction approach assumes the relationship to be a unit of analysis, rather than a single transaction. It relies on the assumption that most business purchases are not individual events and cannot be understood if they are
examined alone. Business purchases are not the action of one party and reaction (or not) of the other, and that what characterises business purchases is that they involve two active parties interacting with each other. (Håkansson 1982, Håkansson & Ford 2002). The basic assumptions of the interaction approach are the following:

- Buyer and seller are active participants in the market;
- The relationship between buyer and seller are frequently long term, close, and involve a complex pattern of interaction between and within each company;
- The links between buyer and seller often become institutionalised into a set of roles that each party expects the other to perform;
- Close relationships are often considered in the context of continuous raw material or component supply. The importance of previous purchases, mutual evaluation, and the associated relationship between the companies in the case of infrequently purchased products is emphasised (Ford 1997).

Ford (1997) refers to different types of exchange: product/service exchange, information exchange, financial exchange, and social exchange. The exchange process will be quite different depending on whether or not the product is able to fulfil an easily identifiable buyer’s need, and for which the characteristics of an appropriate product are easy to specify. Product or service exchange demands technical knowledge. Information exchange’s depth and breadth are important aspects. Technical, economic, and organisational questions dominate this exchange. Financial exchange is connected to money and investments. During social exchange trust and involvement are built.

Möller (1994) has studied both transactional and partner relationships. He uses the term ‘relational exchange’ to refer to partnership relationships that are characterised by different kinds of economic, social, legal, technical, informal, and procedural bonds. Discrete transactions, on the other hand, are described as predominately governed by market forces. In these so-called transactional relationships, buyers and sellers are seen as interacting only on the basis of rather selfish considerations, aiming at merely finalising the single transaction in hand. Future co-operation is not actively considered in the transaction, and the seller is usually accorded a value related to its current products and prices.

The above discussion of the different angles from which to analyse business relationships can be summarised for the most part by referring to the work of Cannon et al. (1999), which summarises the different viewpoints as connectors. Six different kinds of connectors culled from the theories of business
relationships and interdisciplinary empirical research are specified. The six connectors are information exchange, operational linkages, legal bonds, cooperation, relationship-specific adaptations made by the customer, and relationship-specific adaptations made by the supplier. In long-term relationships, social networks become valuable in themselves.

4.2 A priori model

Theoretically, an a priori model consists of four phases: development, purchase, use, and evaluation. The connection between the supplier and customer is described as exchanges. Exchanges can be related to information, financial, software product/service, and social exchange. The software oriented collaboration value model is presented in Table 3.

4.2.1 Development (intended-desired values)

How does a supplier make a decision to develop certain product features? How does a supplier make a product offering? How can offers be customised? How can resources be used effectively? Technical, organisational, and financial decisions play an important role in this phase, because the supplier tries to use its resources effectively in order to construct value offerings that will interest customers more than a competitor’s offerings. This is a period of active product development and information collection. Through market research, the supplier tries to match its intended value with the preferences and desires of customers to create a product that best fulfils needs.

Software development involves costs, including time, talent, and money. The benefits sought are measured in widely varying terms. Nevertheless, in all cases, the basic logic is the same. The goal is maximal value creation for a given investment. Understanding the relationships between technical properties and the decisions that produce them, on one hand, and value creation on the other, is essential in world in which software is so important to all aspects of doing business or providing public services. (Boehm & Sullivan 1999). For a supplier, a customer’s investments at the product development phase are more than welcome. From the customer’s perspective, these investments make it possible to include their desired functionalities in the product. Also customisation increases costs, and through that investments to the customer.
Software design involves both technical and managerial decisions. The use of formal methods and the shape of the architecture are considered to be technical decisions. The continuation or reorientation of a programme in light of new information is a managerial decision. The two are not entirely separable. The selection of a life-cycle model is a technical decision about the managerial framework for a system. Moreover, even where software engineering is concerned with technical issues, the connection to value creation is what matters. (Boehm & Sullivan 1999). Initially, the customer is interested in a product’s attributes and how well they fit their needs. A user or user’s business unit is likely to at least evaluate suitability by using metrics for quality in use.

Developing a software system or portfolio of systems is an ongoing activity of design decision-making that extends across multiple organisational and product granularity levels and through time. The software economics viewpoint on this activity has two basic parts. Foremost is that the objective of software design is to create surplus value. The goal is not to achieve verifiability, evolvability, safety, quality, usability, reusability, reliability, satisfaction of a formal specification, possession of a mathematical semantics, or any other technical property, per se. Technical properties are of course critical to creating value, but they are the means, not the end. The guiding objective for software engineering is design for value added. (Boehm & Sullivan 1999). Although supporting usability aspects through architectural design does not guarantee a usable system—too many implementation decisions must also be made before the system reaches the end user—at least early architectural design decisions can be made that will not preclude delivering a usable system (Bass & John 2003).

Theoretically, the profile of a value offering that encompasses attribute performance, pricing value, relationship building, and co-creation value enables managers to understand what constitutes value and how to assess value in the context of the value-in-offering perspective (Ngo & O’Cass 2009). As expected, the three latent variables, product, service, and relationship, are not independent; they correlate very highly. This indicates that product, service, and relationship variables are dependent. More specifically, the study reveals that a value proposition associated with IT solutions is about more than a product, service, or a relationship. The findings suggest that IT solutions are made up of at least three sources—product, service, and relationship—at different levels. (Ravald & Grönroos 1996, Bolton & Drew 1991, Zeithaml 1988). Value offerings consist of different combinations of these three factors. To the supplier, these are resources to work with in order to find the right combination for each customer. The
product offering consists of product-, service-, and relationship-related benefits and sacrifices. Product and services have to meet customer’s needs to be successful and extract premium prices from the market. Therefore, product development must be driven primarily by customers’ needs rather than technological possibilities. (Butcher & Laker 2000). Further, Ngo & O’Cass (2009) define the value offering to the customer as the value that firms build in a particular product and/or service (brand) in terms of attribute performance (e.g., quality, innovation, and customisation), pricing (fair price and value price), relationship building (easy access, rapid response, and relational nurture), and co-creation of the offering in order to outperform the competition.

All organisations develop some processes for learning about their customers. These processes involve the various ways that managers acquire knowledge about customer value and satisfaction. Data may be acquired informally through direct contact with customers and/or from formal research techniques, such as focus groups and surveys. However it is done, managers’ conceptual understanding of the nature of customer value and satisfaction guides the entire process. For example, if a product design engineer conceives customer value to be the desired performances of the specific physical attributes of a product, data sought from customers likely will be the preferred performances from those particular attributes. (Woodruff et al. 1993).

The basis for the development of a product often stems from the vague ideas a supplier has, but customer’s needs play an important role during the development process. Product and service attributes are value drivers, which seek to fit a customer’s desired value. The focus of exchange is more communicational than material at the moment. “What can you do for me and can you do it better than the competition?” could be key questions to ask. At the end of this phase, the right fit is found and the customer makes a decision to select the offering.

The type of relationship building process described above requires adaptations on the part of both the buyer and the seller. As an example, the buyer may accept training, advice, and involvement from the seller on how to adapt the organisation to accept the new product. The seller may make changes in the design of the product to more specifically suit the buyer’s needs, and assign a team or a representative solely to take care of the needs of the buyer, including helping the buyer solve problems. Although certain changes and concessions are made on both sides to help the relationship grow, the positive aspect is that both parties reap the benefits from such a relationship. The buyer gains a partner to help them solve problems and use the new product to better advantage, and is also
better prepared for the introduction of new technology that satisfies their needs. The seller may experience lower long-run costs, repeat purchases, positive-word-of-mouth feedback, and increased purchases of ancillary products. (Cann 1998).

Customer-desired value is a quite different perception. Here the customer perceives what he or she wants to have happen in a specific kind of use situation, with the help of a product or service offering, in order to accomplish a desired purpose or goal (Flint et al. 1997).

Flint et al. (1997) position desired value as the entire bundle of product attributes and the resulting consequences, both positive and negative, and monetary and non-monetary, that the customer wants to have happen. It is the changes in these preferences for both attributes and consequences that businesses are trying to predict: “What attributes and consequences will my customers want? What sacrifices will they be willing to make? What tradeoffs will they want to make?”

4.2.2 Purchase (designed-expected values)

At the point of trade, customers have expectations that are based on supplier’s promises. This is a moment of exchange, when a deal is made concrete. At this point, mutual understanding has been found. This is the time for negotiations; both parties can decide to end the process if something goes wrong. Expected value may differ from desired value, because the product can’t perfectly match customer’s needs. Intended value differs from that which has been designed because of technical and communicational problems. This is time for financial exchange, and this phase also locks the supplier and customer together for as long as the product is in use. The customer will make a selection based on expectations. There is need to agree on answers to questions such as what, when, how, and at what price.

Enterprises expect to deliver the most valuable offerings to customer through business exchange activities, including the profit maximisation of products, services, personnel and cost minimisation in relation to money, time, energy, and consumables (Kotler 1996). According to Bowman & Ambrosini (2000), one issue then, is how do people develop their expectations, how do they judge the utility they are going to get, i.e. how do they judge the value of a product? The potential purchasers have to judge how the product’s attributes will satisfy their needs. Judgments are made in advance of the consumption of the product, so customers have to make inferences about the range of products on offer based on
a variety of cues. Customers’ perceptions of the value of a good are based on their beliefs about the good, their needs, unique experiences, wants, wishes, and expectations. In other words, customers assess the overall value of a product based on the perception of what is given and what is received (Zeithaml 1988).

Grounded in the conceptualisation of relationship value and the construct’s underlying dimensions derived from literature review, customer value is defined in business relationships as the trade-off between product, service, know-how, time-to-market, and social benefits, as well as price and process costs in a supplier relationship, as perceived by key decision-makers in the customer’s organisation, and taking into consideration the available alternative supplier relationships (Ulaga & Eggert 2005).

Cann (1998) proposes that the ultimate service support is provided when the vendor implements a new product. This process of implementation consists of all of the necessary changes the organisation needs to make to prepare for acceptance of a new product (Cann & Burger 1996). The implementation process also involves learning to use the product to its full potential (Cann & Burger 1996). In the case of a high technology product such as a mainframe computer, vendor involvement with the implementation can provide much needed help to the customer organisation. Tornatzky & Fleischer (1990) indicate that implementation is one of the most critical aspects of new product introduction and acceptance into an organisation, but yet it is often the most overlooked. The changes that implementation can bring with it can involve everything from resistance to change by users, to the redesign of departments or divisions, to changes in human resource policies and procedures, to changes in the physical plant.

Cann (1998) contends that it should be part of the service relational marketing effort of the seller to help the buyer to overcome these substantial and risky changes so that the implementation process will be less invasive, meet with less resistance, and cause fewer disruptions to the buyer organisation. It is suggested that this type of extraordinary marketing effort on behalf of the seller adds value to the relationship by satisfying the customer’s need for a vendor who provides solutions, helps to solve problems, and offers a true partnership.

### 4.2.3 Use (received value)

How well does the product fit its designed purposes? How easy is it to use? How well supported is it? How much does the supplier care about us at the moment? How easy is it to sell more to same customer? This is a period of active use,
where the product is in use and service exchange is activated. Experiences of the use are increasing and the customer starts evaluating how well the product fits to its purpose.

According to Woodruff et al. (1993), most views seem to recognise, at least implicitly, that customers buy products to satisfy needs in use situations. Typically, these needs are translated into the specific attributes of a product or service and of supporting services that targeted customers prefer. Thus, customer value is viewed as the combination of preferred attributes and attribute performances. This attribute concept of value typically also incorporates costs. The price of a product can be viewed as an attribute, and most other cost dimensions, such as the complexity of the product operation, can be incorporated into attribute value as well. In this sense, customer value is a trade-off between desirable attributes (i.e. that which is desired from the seller) compared to sacrifice attributes (i.e. that which is given up to buy and use the product).

There is considerable merit to this attribute-based view of value. Customers can easily talk about the attributes of a product with which they are familiar, so data on attribute value is relatively easy for organisations to obtain. Further, managers can translate what customers tell them about attributes into operational specifications for the organisation’s offer. On the other hand, the attribute-based view of value has a distinct product, rather than customer orientation. It assumes that customer value is largely determined by what is designed into products and supported services. It does not require digging very deeply into the world of the customer to see why certain attributes are preferred. (Woodruff et al. 1993).

One of the value dimensions is called value-in-use, because it concerns the utilitarian benefits of using a product in a situation for which it is designed. Usability is most often defined as the ease of use and acceptability of a system for a particular class of users carrying out specific tasks in a specific environment. Ease of use affects the users’ performance and their satisfaction, while acceptability affects whether the product is used (Bevan 1995).

It is generally accepted that the following five essential usability characteristics should be part of any software project: learnability, so the user can rapidly begin working with the system; efficiency, enabling a user who has learned the system to attain a high level of productivity; memorability, allowing the casual user to return to the system after a period of non-use without having to relearn everything; low error rate, so users make fewer and easily rectifiable errors while using the system, and no catastrophic errors occur; and satisfaction, that makes the system pleasant to use. There are trade-offs among these criteria,
and some are more important than others, although their respective ranking depends on the situation. (Holzinger 2005). Really understanding customers means knowing why they do something, and is not only about knowing that they do something. Usability is tightly connected to customer’s usage, and is particularly focused on how to learn from and even exploit that knowledge.

4.2.4 Evaluation (perceived value)

Focus often changes to evaluate the whole relationship or cumulative experiences. The relationship consists of everyday routines and social exchanges. This is a dynamic period, because current needs can also change and expectations can increase. Information changes to knowledge and it increases understanding and even helps to forecast future needs.

According to Woodruff et al. (1993), processes that an organisation uses to measure value, as perceived by its customers, should be assessed periodically to see if improvements are needed. A measurement process that focuses only on customers’ preferred attributes is useful, but not sufficient to truly understand customer value. Customers can only tell you what they know from past experience. Some of the attributes that customers talk about are ones believed to be predictive of the benefits sought. Other attributes might be mentioned because they distinguish between brands in the customer’s set of alternative choices. Attribute information, at best, limits managers to thinking about how to modify an existing product’s physical characteristics. For instance, if a customer says they want a “smooth shifting transmission”, product design managers will tend to think about how to make the car shift in a smoother fashion. In this way, the attribute data narrows thinking to the specific attribute and desired performance mentioned by the customer. Unfortunately, that same data does not say why “smooth shifting” is important. This approach will not encourage or inspire managers to think about innovative ways to create and deliver increased value to customers.

Learning about customers’ use situations and corresponding value chains often requires more long-term experience from working with a particular customer over time. This means that organisational culture and reward systems must be designed to encourage managers to take the time and effort to deeply understand value from their customers’ point of view. There is no quick and easy way to do this. (Woodruff 1993).

The customer value hierarchy suggests that customers conceive of desired value in a means-end way. Starting at the bottom of the hierarchy, customers learn
to think about products as bundles of specific attributes and attribute performances. When purchasing and using a product, customers form desires or preferences for certain attributes based on their ability to facilitate the achievement of desired consequence experiences, which are reflected in value in use and possession value, and which lead up to the next level in the hierarchy. Customers also learn to desire certain consequences according to their ability to help them achieve their goals and purposes (i.e. highest level). Looking down the hierarchy from the top, customers use goals and purposes to attach importance to consequences. (Clemons & Woodruff 1992). Similarly, important consequences guide customers when attaching importance to attributes and attribute performances. The customer value hierarchy describes received value equally well. Customers evaluate products using the same desired attribute, consequence, and goal structure that they have in mind at that time. (Gardial et al. 1994, Zeithaml 1988). Further, the customer’s use situation plays a critical role in evaluation as well as in desires. If the use situation changes, the linkages between product attributes, consequences, and goals and purposes change as well (Woodruff 1997).

Value judgments can change quite often. Any incident that draws a customer's attention to the supplier is likely to impact that customer's judgment of the value received in that particular experience. This might be in a positive direction or a negative direction. Essentially, customers are seeking, in an abstract sense, to ensure the benefits they experience (e.g., ease of doing business, lack of necessary follow-up, and consistent material throughout) are worth the sacrifices they make (e.g., monetary, psychological, and time). As the trade-off appears to shift, re-evaluations are made. In the positive direction, customers might perceive their benefits to be increasing or their sacrifices to be decreasing. In the negative direction, customers may perceive their sacrifices to be increasing or their benefits to be decreasing. (Flint et al. 1997).

The theory essentially states that customers arrive at satisfaction feelings and thoughts as a result of the comparison between perceived performance and some standard. More specifically, the customer compares a product's perceived performance to a standard, or set of standards, such as those based on expectations. If the focal brand's performance is seen as equal to (confirming) what was expected, the customer is satisfied. If the focal brand's performance exceeds (positively disconfirming) or falls short of (negatively disconfirming) expectations, the customer is very satisfied or dissatisfied, respectively. (Flint et al. 1997).
Spiteri & Dion (2004) collect the consequences of customer value based on a literature review. The literature identifies two types of satisfaction: transactional and overall satisfaction (or cumulative satisfaction). Because of the long-term nature of the relationships, a more appropriate variable to measure is overall satisfaction. Customer satisfaction is one of the most important criteria for customer loyalty. Increasing satisfaction should lead to higher profitability. Ravald & Grönroos (1996) found that loyalty was linked to mutually profitable relationships.

The bonding process begins with the very basic force of the need for a seller to find a buyer for their product, and the desire for a buyer to purchase a product that will satisfy their needs. As time goes on, this relationship then advances toward interdependency between the buyer and the seller, which will finally lead to a situation between the two where there is total commitment by both parties. Termination costs now restrict or almost prohibit an easy dissolution of the bond. The social bond is an outgrowth of personal relationships that develop between the parties involved from both the buyer and the seller organisation. The better the personal fit between the parties, the stronger the social bonds. Wilson (1995) explains that studies that have been done on social bonding reveal that if a strong personal relationship develops between the buyer and the seller, both parties will be more interested in continuing the relationship. (Cann 1998).

Ravald & Grönroos (1996) conclude: ‘the relational aspect as a constituent of the offering is not taken into account. The suggestion is that the relationship itself might have a major effect on the total value perceived. In a close relationship, the customer probably shifts the focus from evaluating separate offerings to evaluating the relationship as a whole’. This means that through experiences, actors learn from each other and that makes it easier to co-operate. The focus changes at the relationship level and is instead of evaluating every episode at time. A strong relationship makes it easier to go through disappointments and solve problems together, without conflicts arising.

4.3 Software oriented collaboration value model

Table 3 summarises the theoretical aspects of this study, as outlined above. Theoretically the model is based on van der Haar et al. (2001) idea of phases called business development, purchase and use, which include supplier’s intended, designed and received value. For customer the values are named desired, expected and received value. The model is integrated with the Woodal’s (2003)
literature review, in which pre-purchase, at the point of trade/experience, use and after use/experience describe the temporal view to value creation. This is closely related to Panasuraman & Grewal’s (2000a) acquisition, transaction, in-use and redemption phases, which have connection to the perceived value. Last phase includes perceived value, and it is named evaluation. It could be named after use, but in the case of software solutions, the use of not ending so quickly. In fact, the software can be in use before the purchase, and the use continues as long as the collaboration continues. Evaluation includes both current situation (use experiences and satisfaction) and future aspects (to support the development).

Supplier’s and customer’s views are connected with interaction/collaboration. Names of exchanges come from Ford’s well-known (1997) types of exchange. According to Easton (1992) adaptation processes are related to exchange processes. Similarly, exchange processes are intimately connected to relationships. Relational elements strongly influence the process of exchange. In a close relationship, the customer probably shifts the focus from evaluating separate offerings to evaluating the relationship as a whole (Lapierre 1997). Ballantyne & Varey (2006) have emphasized that co-production of value requires that marketers view service interactions relationally. Relationships are emergent by nature, a consequence of learning together over time. This means that instead of thinking about relationships, communication, and knowledge renewal as a consequence of managerial action, as is common in hierarchical organisations, the appropriate management model becomes one of interaction. Further, Håkansson & Ford (2002) have seen that relationships are characterised by long-term interaction where factors such as trust, commitment, social bonds, communication and even friendships ties become important.

Customers do not only look for goods or services, they demand a much more holistic offering including everything from information about how to best and safest use a product to delivering, installing, repairing, maintaining and updating solutions they have bought (Grönroos 2004). In this study is used the term exchange to describe these two-way transactions. Someone is giving something to someone else, who needs it and uses it. This idea has its roots in traditional value creation, where give-and-take philosophy is a base for costs-benefits thinking. For example Khalifa (2004) uses terms total value to customers and the total customer ownership costs (pre-, at-use, and post use costs) in the customer value in exchange –model. Further, Day (2000) use term collaborative exchanges to feature close information, social, process linkages, and mutual commitments made in expectation of long-run benefits.
The relationship consists of interactions. For example Cannon et al. (1999) define relationships as chains of interactions, which different attributes are exchanged between two organisations. What is the main focus on interactions during the different phases? First is needed information, what customers may want and what should be developed. Second is more concrete, something is already known. Customer has expectations, and supplier tries to offer right solution. After that the product/service is exchanged, and the use period starts. Customer gets the real use experiences and at the same time supplier makes actions to support use and make it as pleasant as possible. During the process social exchange deepens, and have influences on the relationship and collaboration. The continuation depends on how well the supplier’s solution matches customer’s expectations and experiences. At the end satisfaction has the strongest influence on the future, it has to be measured well. The development of new features and releases is based on the information gathered from customers. For example Woodruff et al. (1993) say that customers can only tell you what they know from past experience. Learning about customers’ use situations and corresponding value chains often requires more long-term experience from working with a particular customer over time. In software business the development is depended on the customers’ use experiences, so gathering information and developing new ways to work together helps supplier to satisfy the needs better. Customers’ involvement is extremely important. In Table 3 is presented the software oriented value collaboration model.
Table 3. The software oriented value collaboration model.

<table>
<thead>
<tr>
<th>SOFTWARE SUPPLIER</th>
<th>DEVELOPMENT</th>
<th>PURCHASE</th>
<th>USE</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended value</td>
<td>Vague ideas</td>
<td>What customers want</td>
<td>Service</td>
<td>Plans for future</td>
</tr>
<tr>
<td>what customers may want</td>
<td>Match</td>
<td>Match</td>
<td>Support</td>
<td>Keep up the relationship</td>
</tr>
<tr>
<td>Technical and managerial decisions</td>
<td>Testing</td>
<td>Testing</td>
<td>Updates</td>
<td>Developing new features and releases</td>
</tr>
<tr>
<td>INTERACTION/ COLLABORATION</td>
<td>Information exchange</td>
<td>Financial exchange</td>
<td>Software product or service exchange</td>
<td>Social exchange</td>
</tr>
<tr>
<td>Technical exchange</td>
<td>Quantity of money</td>
<td>Core of exchange</td>
<td>Build trust and loyalty</td>
<td></td>
</tr>
<tr>
<td>Economical exchange</td>
<td>Investments</td>
<td>Technical knowledge</td>
<td>Social bonds</td>
<td></td>
</tr>
<tr>
<td>Managerial exchange</td>
<td>Investments</td>
<td>Technical knowledge</td>
<td>Relational aspects</td>
<td></td>
</tr>
<tr>
<td>SOFTWARE CUSTOMER</td>
<td>Desired value</td>
<td>Expected value</td>
<td>Received value</td>
<td>Perceived value</td>
</tr>
<tr>
<td>Recognising own needs</td>
<td>Selection based on expectations</td>
<td>Experience of using a software product or service</td>
<td>After use experiences</td>
<td></td>
</tr>
<tr>
<td>Product attributes</td>
<td></td>
<td></td>
<td></td>
<td>Satisfaction</td>
</tr>
</tbody>
</table>
5 Research design

This chapter considers the research methodology and starts out with a general description of my personal journey through the research period. It is followed by a discussion of the values and worldview that have guided this project. A short introduction of the qualitative research will lead into a more focused discussion of the case study method, and more specifically the narrative method. Understanding the whole story is close to the narrative basics. The research design and how and where the empirical material was collected is then explained. Next is explained how the empirical material is analysed. The chapter ends with an evaluation of the process.

5.1 My personal journey

There are several reasons why I became interested in researching value creation theories. My master’s thesis showed me how challenging and interesting subject value creation is. Actually, after all these years, it still is. However, I am not sure if I will ever be able to cover the whole value creation story. I am going to try and that offers motivation not only for this study, but also forthcoming researches.

The second reason for becoming interested in value research is that this topic has not been subject to too much theoretical research. Of course several perspectives have come close but a gap remains. The biggest problem during the process was that theories have big gaps, they tell something, but not enough. I wanted to know how the value creation process works between suppliers and customers, but I couldn’t find any research to fully explain the real process. From the customers’ perspective the processes involved in the creation of their perceptions of value and how they experience it have been examined. The process is concentrated on the buyer’s situation, where customers select the right product for the right need. From the suppliers’ perspective, the construction of the value offering is researched, providing an explanation as to why customers select one product over another. After the customer has bought the product or service, the game is over. This is the traditional business perspective, when the buying situation is the most important part of the process. Nowadays the role of cooperation has grown, and through that interactions between customers and suppliers have become more important.

The third reason is that the theories are not the same in practice. In particular, when we talk about software business, there are several differences compared to
traditional markets. Information processing science has concentrated research areas like user-centred design, which bring use situations into focus in the research. They claim that the role of users and use situations plays the most important role in the process. In practice, everything is solved if users perceive the product to be a success or not, by using it or not. If they don’t use the product or service, it can never be really successful. This one simple thing influences the entire business, and if the suppliers understand it, the business exchange is a lot easier. So, when I started to understand that instead of buying, the focus should be on using products and services, I was a lot of closer to finding answers. In actuality, I have also found more questions. Is it really true that there is no value before the use? This was one of the most interesting questions during my research.

The fourth reason for my journey was that I want to know how value creation works. Who creates the value and where does it go? I had to start with suppliers, because they create the products and services, and are like a motor for the process in that they offer the fuel to keep the process going. Because suppliers are so dependent on customers, it seems obvious that both play active roles in the process. So, if they both have active roles they also should have a common goal, and a reason to work together. This common goal could be called higher value, which offers something to both parties. So what exactly is it and is it enough to keep them together? In software business, the switching costs are high and relationships end only for a good reason. The existence of a relationship seems to be a good reason to stay together and try to find the best way to do common things. This then begs the question, what are these common things and who decides what to do and where to go?

After all the theoretical wondering, I decided to ask how things are done. This part of my journey was the most interesting, because I met several experts, who actually do these things in practice. I collected my empirical material by interviewing people in four software organisations. I am very grateful to them because they opened my eyes to see and understand not only the practical part of my research, but also the reality, which was even more complex than I expected. I fulfilled my theoretical framework based on the empirical material and thus gained a more complete picture of the process.

5.2 Qualitative research

In this study is used qualitative research method. In this chapter is explained more detailed why and how. First few definitions what is qualitative research and what
kind of guidelines it has. When is presented both case study and narrative research methods, because both have some influences on this study. After that is explained how this study is made. Finally, the evaluation summarises the whole process and gives tools to think about truth and reality.

According to Denzin & Lincoln (1994) qualitative research focuses on interpretation of phenomena in their natural settings to make sense in terms of the meanings people bring to these settings. Qualitative research involves collecting information about personal experiences, introspection, life story, interviews, observations, historical, interactions and visual text which are significant moments and meaningful in peoples' lives.

Patton (2002) defined qualitative research as attempting to understand the unique interactions in a particular situation. The purpose of understanding is not necessarily to predict what might occur, but rather to understand in depth the characteristics of the situation and the meaning brought by participants and what is happening to them at the moment. The aim of qualitative research is to truthfully present findings to others who are interested in what you are doing.

The diversity of what is called qualitative research, because of its relevance to different disciplines and professions, challenges anyone to arrive at a succinct definition. Too brief definition will seem to exclude one discipline one another. Too broad definition will seem uselessly global. In fact, the term qualitative research may be like other terms of the same genre—for example, sociological research, psychological research, or educational research. Within its own particular discipline or profession, each term connotes a large body of research, embracing a variety of highly contrasting methods. (Yin 2011).

According to Denzin & Lincoln (2008) three interconnected, generic activities define the qualitative research process. They go by a variety of different labels, including theory, analysis, ontology, epistemology, and methodology. The gendered, multiculturally situated researcher approaches the world with a set of ideas, a framework (theory, ontology) that specifies a set of questions (epistemology) that he or she then examines in specific ways (methodology, analysis). That is, the researcher collects empirical materials bearing on the question and then analyses and writes about those materials. Every researcher speaks from within a distinct interpretive community that configures, in its special way, the multicultural, gendered components of the research act.

A distinction between what knowledge to shoot for, fundamentally separates quantitative and qualitative inquiry. Perhaps surprisingly, the distinction is not directly related to the difference between quantitative and qualitative data, but a
difference in searching for causes versus searching for happenings. Quantitative researchers have pressed for explanation and control; qualitative researchers have sought to understand the complex interrelations among all that exists. (Stake 1995). Even if it is not the prime purpose of doing particular research, the main purpose of research is to produce insights or knowledge. Knowledge implies that we know something, that what we know holds true, and that the produced knowledge is valid. Doing research also implies that we add to the knowledge that exists: that is, research is done to create new insights. For example, if a business firm conducts a study to examine what buyers consider when buying a particular product, it is done to create new insights believed to be important to the firm, so that it can improve its marketing efforts. (Ghauri & Gronhaug 2005).

Qualitative research means different things in each moment of history. Nonetheless, an initial, generic definition can be offered: Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meaning people bring to them. Accordingly, qualitative researchers deploy a wide range of interconnected interpretive practices, hoping always to get a better understanding of the subject matter at hand. It is understood, however, that each practice makes the world visible in a different way. (Denzin & Lincoln 2005).

Yin (2011) presents five features of qualitative research as follows:

- Qualitative research involves studying the meaning of people’s lives, under real-world conditions.
- Qualitative research differs because of its ability to represent the views and perspectives of the participants in a study. Capturing their perspectives may be a major purpose of a qualitative study.
- Qualitative research covers contextual conditions—the social, institutional, and environmental conditions within which people’s lives take place. In many ways, these contextual conditions may strongly influence all human events.
- Qualitative research is not just a diary or chronicle of everyday life.
- Qualitative research strives to collect, integrate, and present data from a variety of sources of evidence as part of any given study. The variety will
likely follow from your having to study a real-world setting and the diversity of its participants. The complexity of the field setting and the diversity of its participants are likely to warrant the use of interviews and observations and even the inspection of documents and artefacts. (Yin 2011).

Qualitative research seems to promise that we will avoid or downplay statistical techniques or mechanics of the kinds of quantitative methods used in, say, survey research or epidemiology. We should never assume that qualitative methods are intrinsically superior. Indeed, a quantitative approach may sometimes be more appropriate to the research problem in which we are interested. So, in choosing a method, everything depends upon what we are trying to find out. No method of research, quantitative or qualitative, is intrinsically better than any other. Moreover, research problems are not neutral. How we frame a research problem will inevitably reflect a commitment (explicit or implicit) to a particular model of how the world works. So when we say that we are committed to qualitative methods, we still need to find answers to at least two questions:

- Exactly what methods do we have in mind (e.g. interviews, focus groups, observation, texts, audio or video recordings)?
- In what ways are these methods relevant to our research problem and to our model of how the world is put together? (Silverman 2005).

In this study it was obvious to use interviews as a research method, because making interviews is effective way to collect data. I knew from the very beginning of the research process, that I am going to select at least two case organisations. The main research question supports the made decision, so there were no reason to make any changes during the process.

A key to understanding qualitative research lies with the idea that meaning is socially constructed by individuals in interaction with their world. The world, or reality, is not the fixed, single, agreed upon, or measurable phenomenon that it is assumed to be in positivist, quantitative research. Instead, there are multiple constructions and interpretations of reality that are in flux and that change over time. Qualitative researchers are interested in understanding what those interpretations are at a particular point in time and in particular context. Learning how individuals experience and interact with their social world, the meaning it has for them, is considered an interpretative qualitative approach. Further, all qualitative research is characterised by the search for meaning and understanding, the researcher as the primary instrument of data collection and analysis, an
inductive investigative strategy, and a richly descriptive end product. (Merriam 2002).

A basic interpretative and descriptive qualitative study exemplifies all the characteristics of qualitative discussed above; that is, researcher is interested in understanding how participants make meaning of a situation or phenomenon, this meaning is mediated through the researcher as instrument, the strategy is inductive, and the outcome is descriptive. In conducting a basic qualitative study, you seek to discover and understand a phenomenon, a process, the perspectives and worldviews of the people involved, or a combination of these. Data are collected through interviews, observations, or document analysis. These data are inductive analysed to identify the recurring patterns or common themes that cut across the data. A rich, descriptive account of the findings is presented and discussed, using references to the literature that framed the study in the first place. (Merriam 2002).

In contrast with the scientific/empirical approach, the interpretive approach's main strength is its ability to create new ideas and gain understanding of the phenomena. Due to the subjective nature of the interpretive approach, this fact is the basis of its weakness. And as the process flows in an unstructured manner, it is highly possible that this approach will breed biased interpretations amongst people who have different constructs. Some of the commonly used interpretive methods include: future research, game/role playing, subjective/argumentative research, action research, and descriptive/interpretive research. (Galliers 1991).

Deductive theory represents the most common view of the nature of the relationship between the theory and research. The researcher, on the basis of what is known of a particular domain and of theoretical considerations in relation to that domain, deduces a hypothesis (or hypotheses) that must then be subjected to empirical scrutiny. Embedded within the hypothesis will be concepts that will need to be translated into searchable entities. With an inductive stance, the theory is the outcome of research. In other words, the process of induction involves drawing inferences that can be generalised out of observations. To put it crudely, whereas deduction entails a process in which theory leads to observation/findings, with induction the connection is reversed and observations/findings lead to theory. However, just as deduction entails an element of induction, the inductive process is likely to entail a modicum of deduction. Once the phase of reflection on a set of data has been carried out, the researcher may want to collect further data in order to establish the conditions in which a theory will and will not
Such a general strategy is often called iterative: it involves *a weaving back and forth between data and theory.* (Bryman & Bell 2003).

According to Patton (2002), *inductive analysis* involves discovering patterns, themes, and categories in one’s data. Findings emerge out of the data, through the analyst’s interactions with the data, in contrast to deductive analysis where the data is analysed according to an existing framework. Qualitative analysis is *typically inductive in the early stages,* especially when developing a codebook for content analysis or figuring out possible categories, patterns, and themes.

Ghauri & Gronhaug (2002) consider qualitative methods to be useful for studies that are *explorative in nature and aim at theory development.* Furthermore, using a qualitative research approach requires that the researcher is intensively in the field, makes observations, analyses, synthesises, and exercises subjective judgments (Stake 1995). Qualitative research involves the use of many diverse and interconnected methods such as case study, personal experience, historical texts, interviews, and observations. I see this study to be more theory-building than theory-testing, because the theoretical framework is fulfilled after the empirical analysis.

A first strength of the *theory that builds from the cases* is its likelihood for generating novel theory. Building theory from case studies centres directly on this kind of juxtaposition. That is, attempts to reconcile evidence across cases, types of data, and different investigators, and between cases and literature increase the likelihood of creative reframing into a new theoretical vision. Although a myth surrounding theory building from case studies is that the process is limited by investigators' preconceptions, in fact, the opposite is true. This constant juxtaposition of conflicting realities tends to "unfreeze" thinking, and so the process has the potential to generate theory with less researcher bias than theory built from incremental studies or armchair, axiomatic deduction. A second strength is that the emergent theory is likely to be testable with constructs that can be readily measured and hypotheses that can be proven false. A third strength is that the resultant theory is likely to be empirically valid. The likelihood of valid theory is high because the *theory-building process is so intimately tied to the evidence,* such that it is very likely that the resultant theory will be consistent with empirical observation. (Eisenhardt 1989).

However, some characteristics that lead to strengths in theory building from case studies also lead to weaknesses. For example, the intensive use of empirical evidence can yield overly complex theory. Another weakness is that building theory from cases may result in narrow and idiosyncratic theory. Case study
theory building is a bottom-up approach such that the specifics of the data produce the generalisations of the theory. The risks are that the theory describes a very idiosyncratic phenomenon or that the theorist is unable to raise the level of generality of the theory. Perhaps "grand" theory requires multiple studies or an accumulation of both theory-building and theory-testing empirical studies. (Eisenhardt 1989). I agree, because the certain context influences on the results and should be tested in other contexts.

5.3 Case study method

Case studies are defined in various ways and a standard does not exist. However, a definition compiled from a number of sources in Benbasat et al. (1987) runs as follows: A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations). The boundaries of the phenomenon are not clearly evident at the outset of the research and no experimental control or manipulation is used. According to Hartley (2004) case study research consists of a detailed investigation, often with data collected over a period of time, of phenomena, within their context. The aim is to provide an analysis of the context and processes, which illuminate the theoretical issues being studied. The phenomenon is not isolated from its context (as in, say, laboratory research) but is of interest precisely because the aim is to understand how behaviour and/or processes are influenced by, and influence context. This method fits perfectly well to this study, because the focus in on certain types of organisations and their processes.

When to use case study method?

- The type of research question: typically to answer questions like “how” and “why”.
- Extend of control over behavioural events: when investigator has a little/no possibility to control the events.
- General circumstances of the phenomenon to be studied: contemporary phenomenon in a real-life context. (Yin 1994).

When deciding whether to use the case study approach or not, there are a number of factors to consider. If there is a need to focus on contemporary events or phenomena in a natural setting, clearly the case study is advantageous. The same is also true if there is no strong theoretical base for the research, i.e. if it is a
theory building research project. A rich and natural setting can be fertile ground for generating theories. (Benbasat et al. 1987). However, if there is a need for the control or manipulation of variables, then the case study would not be appropriate. It is important to clarify that need should relate to the nature of the problem rather than to the (in)ability of the researcher(s) to undertake research using a particular methodology. Within the case study approach there are a number of variations.

Stake (2000) identifies three types of case study. He calls a study an *intrinsic case study* if it is undertaken, because first and last, the researcher wants better understanding of this particular case. Here, it is not undertaken primarily because the case represents other cases or because it illustrates a particular trait or problem, but because, in all its particularity and ordinariness, the case itself is of interest. The researcher at least temporarily subordinates other curiosities so that the stories of those “living the case” are teased out. The purpose is not theory building.

It is an *instrumental case study* if a particular case is examined mainly to provide insight into an issue or to redraw a generalisation. The case is of secondary interest, it plays a supportive role, and it facilitates our understanding of something else. The case still is looked at in depth, it contexts scrutinised, its ordinary activities detailed, but all because this helps the researcher to pursue the external interest. With even less intrinsic interest in one particular case, a researcher may jointly study a number of cases in order to investigate a phenomenon, population or general condition. This is called a *collective case study*. It is instrumental case study extended to several cases. Individual cases in the collection may or may not be known in advance to manifest some common characteristics. They are chosen, because it is believed that understanding them, will lead to better understanding, perhaps better theorising, about still larger collection of cases.

Yin (1994) presents exploratory, explanatory and descriptive research designs, which depend on the richness of the rival propositions in theories related to the topic of the study; richest theories allow explanatory designs. Next is explained each of these more detailed.

In *exploratory case studies*, fieldwork and data collection may be undertaken prior to the definition of the research questions and hypotheses. This type of study has been considered to be a prelude to some social research. However, the framework of the study must be created ahead of time. Pilot projects are very useful in determining the final protocols that will be used. Survey questions may be dropped or added based on the outcome of the pilot study. Selecting cases is a
difficult process, but the literature provides guidance in this area. (Yin 1989). Stake (1995) recommended that the selection offers the opportunity to maximise what can be learned knowing that time is limited. Hence, the cases that are selected should be easy and willing subjects. A good instrumental case does not have to defend its typicality. Yin (1994) uses a basic categorisation scheme for the types of questions. If the research questions focus mainly on “what” questions, the research is exploratory and a survey is the preferred research strategy.

Explanatory cases are suitable for doing causal studies. In very complex and multivariate cases, the analysis can make use of pattern-matching techniques. Yin and Moore (1988) conducted a study to examine the reason why some research findings become part of practical use. They used a funded research project as the unit of analysis, where the topic was constant but the project varied. The utilisation outcomes were explained by three rival theories: a knowledge-driven theory, a problem-solving theory, and a social-interaction theory. According to Yin (1994), “how” and “why” questions are more explanatory and likely to lead to the use of case studies, histories, and experiments as preferred research strategies. This is because such questions deal with operational links needing to be traced over time, rather than mere frequencies or incidence. This case study has also how-question as a main research question.

Descriptive cases require that the investigator begins with a descriptive theory, or face the possibility that problems will occur during the project. Pyecha (1988) used this methodology to study special education, using a pattern-matching procedure. Several states were studied and the data about each state’s activities were compared to another, with idealised theoretic patterns. What is implied in this type of study is the formation of hypotheses of cause-effect relationships. Hence, the descriptive theory must cover the depth and scope of the case under study. The selection of cases and the unit of analysis is developed in the same manner as other types of case studies.

Yin (1994) summarises that the first and most important condition for differentiating among the various research strategies is to identify the type of research question being asked. In general, “what” questions may either be exploratory (in which case any of the strategies could be used) or about prevalence (in which surveys or the analysis of archival records would be favoured). “How” and “why” questions are likely to favour the use of case studies, experiments, or histories. Knowledge-driven theory means that ideas and discoveries from basic research eventually become commercial products. Problem-solving theory follows the same path, but originates not with a
researcher, but with an external source identifying a problem. The social-interaction theory claims that researchers and users belong to overlapping professional networks and are in frequent communication.

*How to select cases* is perhaps the most important issue in this type of research. As in other methods of data collection, it is important to decide the target population that is to be used for the investigation. It includes those firms, individuals, groups or elements that will be presented in the study. The cases should correspond to our theoretical framework and the variables we are studying. Case selection should also take into account the type of organisation being studied. (Ghauri 2004). Further, the researcher examines various interests in the phenomenon, selecting a case of some typicality, but leaning toward those cases that seem to offer opportunity to learn (Stake 2000). I selected cases from the same business type and with same kind of features. Another main decision was to select multiple cases.

*How many cases* should be included to the study? The answer to this question is very difficult as there is no upper or lower limit to the number of cases to be included in the study. Many times only one is enough. It is the research problem and the research objectives that influence the number and the choice of cases to be studied. Single cases are appropriate when a particular case is critical and we want to use it to explain or question an established theory. It is a critical case because it meets all the conditions necessary to confirm, challenge or extend the theory. In comparative or multiple case studies, we ask or study the same questions in a number of organisations and compare them with each other to draw conclusions. The purpose of data collection in comparative case study method is to compare (replicate) the phenomenon (for example strategy formation) in a systematic way, to explore different dimensions or our research issues or to examine different levels of research variables. In this approach we should be clear that every case has to serve a particular purpose in the study. (Ghauri 2004). According to Yin (1994) single case study is useful when the case seems to present a critical test to existing theory, including rare or unique events. Multiple cases, if a replication logic is supposed to reveal support for theoretically. Theoretical framework is the vehicle for generalisations to new cases, if empirical cases do not work as predicted, modifications must be made to the theory.

Besides the option of carrying out a case study by quantitative or qualitative means, there are also different alternatives for the case study design. Yin (1994) talks about four possible alternatives, as one can conduct either a single-case study or a multiple-case study and both of these can employ a single unit/level of
analysis (i.e. a holistic case study design) or multiple units/levels of analysis (i.e. an embedded case study design). A key feature of the design of case study research is the number of cases included in a project. Generally speaking, it is better, i.e. more valid and generalisable, to include multiple cases though there are instances where a single case is instructive (see e.g. Lee 1989). Exploratory studies are generally better served by single cases, i.e. where there is no previous theory. A single case can also be used to test an existing, well-formed theory. Multiple cases are preferable when the purpose of the research is to describe phenomena and to develop and test theories. Multiple cases also permit cross-case analysis, a necessary feature for widespread generalisation of theories.

Through using multiple-case study designs it is possible to replicate the case and thus make use of the research evidence gained from the cross-analysis of all the multiple cases. However, despite their often-proposed more compelling evidence, multiple case studies can be difficult to conduct. Multiple-case studies often require extensive resources and time that extend beyond the means of an independent researcher. There might also be situations where the use of multiple cases is not possible, as several alternative cases may be difficult to locate and access, so that real cross-analysis could be made between them. (Yin 1989). This study represents a multi-case study with a single level of analysis.

Difficulty in generalising from case studies has been considered a major shortcoming of the method, regardless of whether the research involves single or multiple-case studies. However, the focus on design as the driving definition of case studies provides useful advice for dealing with this problem. The remedy is to consider a case study, as a unit, to be equivalent to an experiment, as a unit; multiple-case studies may then be considered equivalent to multiple experiments. Under this assumption, the problem of generalising from case studies is no different from the problem of generalising from experiments, where hypotheses and theory are the vehicles for generalisation. To this extent, investigators conducting case studies are not “theory driven” (a criticism that has been raised by some), but are “driven to theory”. (Yin 1999). The case study method is also suited to theory development research (Ghauri & Gronhaug 2002) as this study is.

5.4 Narrative method

My interest on narrative research method started before I even know that something like this exists. I am a storyteller. I want always know how things happen, what kind of order they have and what is the reason to do something.
Everything in this study happens in chronological order, especially important is to follow the value – where it comes from, where it goes – who gets the ball next? It has to be noticed, that this study has some narrative influences, but this is not pure narrative research. Main focus is different, when in narrative research the focus is on exploring the life of an individual, in case study the focus is on developing an in-depth description and analysis of a case or multiple cases (Creswell 2007). There is still long way from studying cases and events (case study) to studying individuals (narrative study), but for example interviewees’ experiences have an important role in this study. I tried to give a space to my interviewees and asked a lot of examples. “And what happened next?”

According to Hartley (2004) a mistake in writing up case studies is to believe that the narratives are the most interesting aspect of the study. Narrative alone is unlikely to be of interest to those outside the organisation and every effort has to be made to draw out the wider implications of the study while giving a strong sense of the particular circumstances of the case. Sometimes a brief description of the main events – perhaps in a tabulated diary form – can se the events chronologically in a succinct way so that the writing can then pursue themes. Yin (1994) suggests that an antidote to time-based rather than issue-based analysis is to write the later elements of the case first, and work backwards to the beginning.

Explanation is essential to theory and practice. If we see an organisation doing well, we want to reproduce the success; if we see one doing poorly, we want to prevent failure. Either way, we need a theory – an explanation of what is causing the observed outcomes. Further, narrative is especially relevant to the analysis of organisational processes because people do not simply tell stories-they enact them. Narrative data have surface features that are useful for description, but explanatory process theories must be based on deeper structures that are not directly observable. (Pentland 1999)

Facts rarely speak for themselves – and never in isolation. Narratives and stories enable us to make sense of them, to identify their significance, and even, when they are painful or unpleasant, to accept them and live with them. Narratives and stories feature prominently as sense-making devices, through which events are not merely infused with meaning, but constructed and contested. (Gabriel 2004). Narratives do not mirror they refract the past. Imagination and them meaningful for others. Narratives are useful in research precisely because storytellers interpret the past rather than reproduce it as it was. The “truths” of narrative accounts are not in their faithful representations of a past world, but in the shifting connections they forge among past, present, and future. They offer
storytellers a way to re-imagine lives (as narratives do for nations, organisations, and for ethnic/racial and other groups forming collective identities). (Riessman 2005).

Researchers and evaluators analysing qualitative data strive to understand a phenomenon or programme as a whole. This means that a description and interpretation of a person’s social environment, or an organisation’s external context, is essential for an overall understanding of what has been observed during fieldwork or said in an interview. This holistic approach assumes that the whole is understood as a complex system that is greater than the sum of its parts. (Patton 2002).

Storytelling, to put the argument simply, is what we do with our research materials and what informants do with us. The story metaphor emphasises that we create order and construct texts in particular contexts. The mechanical metaphor adopted from the natural sciences (increasingly questioned there) implies that we provide an objective description of forces in the world, and we position ourselves outside to do so. There is considerable disagreement about the precise definition of narrative. Among one group, the definition is so overly broad as to include just about anything. Most scholars treat narratives as discrete units, with clear beginnings and endings, and as detachable from the surrounding discourse rather than as situated events. (Riessman 1993).

Humans are storytellers who, individually and collectively, lead storied lives. Thus, the study of narrative is the study of the ways humans’ experience the world (Connelly & Clandinin 1990). The answers people provide, in particular qualitative interviews, can be viewed as stories that are potential fodder for a narrative analysis. In other words, narrative analysis relates not just to the life span but also to accounts relating to episodes and to the interconnections between them. (Bryman & Bell 2003). As Brown (1998) notes, one of the advantages of narrative analysis is that it conveys a clear sense of an organisation as an arena in which a variety of perspectives and viewpoints coexist, rather than a monolithic entity with a single voice. In this sense, all research when it is written up entails a narrative analysis because the researcher always has a story to tell about his or her data.

How fully the researcher embraces narrative inquiry is indicated by how far she turns in her thinking and action across what we call here the four turns toward narrative. The four include the following: (1) a change in the relationship between the person conducting the research and the person participating as the subject (the relationship between the researcher and the researched), (2) a move from the use
of the number toward the use of words as data, (3) a change from a focus on the
general and universal toward the local and specific, and finally (4) a widening in
acceptance of alternative epistemologies or ways of knowing. (Pinnegar &
Daynes 2007).

According to Riessman (2005), narrative analysis in the human sciences
refers to a family of approaches to diverse kinds of texts, which have a storied
form in common. As nations and governments construct preferred narratives
about history, so too do social movements, organisations, scientists, other
professionals, ethnic/racial groups, and individuals through stories of experience.
What makes such diverse texts “narrative” is their sequence and consequence:
*events are selected, organised, connected, and evaluated as meaningful for a
particular audience.* Storytellers interpret the world and experience in it; they
sometimes create moral tales about how the world should be. Narratives represent
storied ways of knowing and communicating (Hinchman & Hinchman 1997). In
this study, the first part of the analysis was to find a story, so the narrative
methods are meaningful to present.

According to Creswell (2007) narrative research is a challenging approach to
use. The researcher needs to collect extensive information about the participant,
and needs to have a clear understanding of the context of individual’s life. It takes
keen eye to identify in the source material gathered the particular stories that
capture the individual’s experiences.

### 5.5 Empirical material collection

Empirical material is collected in *four case organisations*. The case organisations
are selected from the same business area, which is the software product business.
They have own product development and strong history in it, which can make
difficult to operate in the service business. They offer also service, but it is
dependent on the product. Usually solution offered to customers includes both
product and service.

I selected these four organisations to fulfil each other and make a picture
more completed. So, I don’t compare organisations. Theoretically it is important
to select organisations, which fit to right context. My main research question is
tightly connected to the software business, so right perspective is important.
Empirically it is more interesting to have organisations, which have different kind
of products and also different customer groups. This makes data richer, and gives
more possibilities to make interpretations. This selection process was my first step
to the empirical part of the study. In the first case organisation is made more interviews to get the whole picture, others fulfil the picture and give more perspectives and ideas how to organise the practical information. Next is shortly presented the case organisations of this study.

*Case organisation A* provides its customers tools and applications for telecommunications network testing. Their offering also covers a wide range of product-related services, along with a smooth upgrade path and flexible support for their products. They have three strong product lines.

*Case organisation B* is a software engineering firm that designs and implements complex information system projects as well as providing skilled subcontracting services. They offer software products, including mobile work management. Under the same roof is possible to find the best market for video-conferencing facilities and modern server platform solutions.

*Case organisation C* is the world's leading security services provider of Internet operators. Solutions are available as a service subscription through hundreds operators around the world. Case organisation is the global leader in this area. They do also mobile security.

*Case organisation D* offers enhancing knowledge management and human resources information management. They provide software solutions and professional services of systematic human resource management, recruitment and leadership support.

According to Miles & Huberman (1994) multiple case sampling adds confidence to findings. By looking at a range of similar and contrasting cases, we can understand single-case finding, grounding it by specifying how and why it carries on as it does. We can strengthen the precision, the validity, and the stability of the findings. The choice of cases usually is made on conceptual grounds, not representative grounds. The cases often are arrayed on a continuum (e.g. highly gifted to underachieving pupils), with few exemplars of each, or they are contrasted (e.g. assertive and passive adolescents). The multiple-case sampling gives us confidence that our emerging theory is generic, because we have seen it work out –and not work out- in predictable ways.

The cases in this study have been carefully selected. The research started with one case organisation, but was fulfilled with three other organisations to provide a more specific picture of the reality. The organisation of the first case is dependent upon in-house software product development, and it is also the largest organisation studied. All of the organisations studied have their own software development, so this guides this study in the direction of the software product...
business. This is not the whole truth, because organisations also offer services, for example, a consulting service, as a part of their business. The service is mentioned in future-plans as a widening business area. In Figure 7 is presented the research process of this study.

Fig. 7. The research process.

While it is tempting in a case study to go on collecting more data, thought has to be given to the opportunity costs and to the management of the data collected. Will a further interview or period of observation add significantly to what you already know? Does it allow you to be reasonably certain there is no disconfirming evidence in the organisation? At some point you have to decide to stop collecting further data. (Hartley 2004).

5.5.1 Interviews

The interview is a flexible and adaptable way of finding things out. The human use of language is fascinating both as a behaviour in its own right, and for the virtually unique window that it opens on what lies behind our actions. Observing behaviour is clearly a useful inquiry technique, but asking people directly about what is going on is an obvious short cut in seeking answers to our research questions. (Robson 2002). Interviews are easy and direct way to collect data, and there is a possibility to ask more details and examples to clear out the whole story.

As Ghauri et al. (1995) have stated a process-based approach and the researcher’s own interpretations and closeness to the data can be tied to
qualitative methods. Thus, it is typical of qualitative methods that data is gathered through a series of semi-structured interviews, which are usually very discussion-oriented. Such an approach has been utilised in carrying out the interviews for the present study. Thus, instead of structured questions, I have utilised broader themes with which the phenomenon under investigation has been covered from different perspectives. Informants’ own opinions and subjective views have been emphasised, with an attempt to keep the interviews as conversational as possible. List of the interviews carried out are provided in Appendix 1 and general themes of interviews in Appendix 2.

Interviews can, for example, be divided into unstructured, semi-structured and fully structured interviews. In an unstructured interview, the interview questions are formulated as general concerns and interests from the researcher, who lets the conversation develop within this area. Objective is explorative, when in fully structured and semi-structured it is descriptive and explanatory. In a fully structured interview all questions are planned in advance and all questions are asked in the same order as in the plan. In a semi-structured interview, questions are planned, but they are not necessarily asked in the same order as they are listed. The development of the conversation in the interview can decide which order the different questions are handled, and the researcher can use the list of questions to be certain that all questions are handled. Additionally, semi-structured interviews allow for improvisation and exploration of the studied objects. Semi-structured interviews are common in case studies. (Robson 2002). Also my interviews were semi-structured, I made questions in different order and even different form.

As Patton (1987) has observed, the way a question is worded is one of the most important elements in determining how the interviewee will respond. Patton maintains that from the point of view of qualitative evaluation, questions should be, at the very least, open-ended, neutral, sensitive, and clear. This study aimed to find the story of how the process continues, and based on that, a space was left on the questionnaire for the interviewees to complete. Questions are not dependent on the compiled list, but provide themes for structuring the interviews. This means that in practice, all interviewees didn’t answer the same questions and the order of the questions may also have varied.

I selected interviewees from management, sales and development. Managers have a general point of view to different tasks on the organisation. They know both strategy and operational level. Sales have connects on the customers and markets, and their expertise is on the commercial side of the products. Development know best how the product is developed and what kind of changes
is possible to make. All these perspectives support and fulfil each other, but they have some specialities. Each organisation has at least one interviewee from management, sales and development level. See more detailed list in Appendix 1.

Interviewing is not simply about asking questions in the most appropriate fashion; the interviewer needs to assume and maintain control over the interview. Initially, this may be easier with some interviewing strategies than others. For example, with structured interviews the interview schedule, with its carefully worded questions, prompts, probes and provides other instructions for the interviewer, and imposes a format on the interview. The task facing the interviewer is to collect information by guiding the interviewee through a series of predetermined questions. In contrast, an unstructured interview is not scripted in the same way; the encounter between the interviewer and interviewee is much less formal and resembles a natural conversation. The primary purpose is to obtain data that provide an insight into how interviewees define and account for particular situations and circumstances. The interviewer does not attempt to prejudge what the relevant issues might be. (Clarke & Dawson 1999).

The interview is the main road to multiple realities. Just with gathering observation data, the interviewer needs to have a good plan. It is easy to fail to ask the right questions, and it is difficult to steer some of the most informative interviewees to the choice of issues. Getting candidates to acquiescence to interviews is perhaps the easiest task in case study research. Getting a good interview is not so easy. (Stake 1995). One important choice was to ask for examples, which efficiently connects the theory to the reality, and clarifies the difference between desire and the reality of a situation.

One big challenge during the interviews was to get interviewees speak freely. For example Robson (2002) researcher’s job is to try to get interviewees to talk freely and openly. Researcher’s behaviour has a major influence on their willingness to do this. Few main rules to do this are: (1) listen more than speak, (2) put questions in a straightforward, clear and non-threatening way, (3) eliminate cues which lead interviewees to respond in a particular way, (4) enjoy it (or at least look as though you do). It is also essential that you take a full record of the interview. This can be from notes made at the time and/or a recording of the interview.

In this study, the interviews were compiled in two separate sections. After a few interviews with the first organisation, the theory was fulfilled and it was possible to continue with the other organisations. There were three new case organisations in this section. The first case organisation was also with, because I
wanted to both fulfil the existing material and update it. First interviews are made at the end of year 2007. Second period was at the end of year 2009 and at the beginning of the year 2010.

According to Hartley (2004) data collection and analysis are developed together in an iterative process in a case study (a contrast with experiments and surveys). This can be a strength as it allows for theory development, which is grounded in empirical evidence. However, a danger is that the researcher reaches premature closure, having been unduly influenced by particularly vivid, unusual or interesting data.

Each interview was planned to last one hour, but in practice there is some variation. All interviews were recorded and also field notes during the interviews were made. The field notes include both interviewees’ and researcher’s comments and ideas. Transcriptions of interviews were made all at once, I used outside help to save time. I have stored recordings, transcriptions, and field notes, and I have made lists to keep the material in order. For example according to Eisenhardt (1989) one key to useful field notes is to write down whatever impressions occur, that is, to react rather than to sift out what may seem important, because it is often difficult to know what will and will not be useful in the future. A second key to successful field notes is to push thinking in these notes by asking questions such as "What am I learning?" and "How does this case differ from the last?"

### 5.5.2 Analysing the empirical material

Qualitative analysis transforms data into findings. No formula exists for that transformation: guidance exists but there is no recipe. Direction can and will be offered, but the final destination remains unique for each inquirer, and it is known only when, and if, it is arrived at. Medieval alchemy aimed to transmute base metals into gold. Modern alchemy aims to transform raw data into knowledge, the coins of the information age. Rarity increases value. Fine qualitative analysis remains rare and difficult and, therefore, valuable. (Patton 2002).

Qualitative study capitalises on how sense can be extracted from the ordinary. Each person has a great deal of experience encountering strange objects and phenomena. Initially, some of them just don’t seem to fit anything we are familiar with, but then, suddenly, some of them become familiar. It is like unexpectedly running across someone we have not seen for years. At first we don’t recognise them, then with surprising speed, the face fits into a pattern that we do recognise. We then wonder why we did not recognise them in the first place. (Stake 1995).
My interviewees were with people from so many different organisations and positions, so that this really held true. First it seems to be impossible to find any common issues from the gathered material. So, I started to search stories and chronologic orders.

Analysis of evidence is one the least developed and most difficult aspects of doing case studies. Most important is to have a general analytic strategy, which helps to choose among different techniques. In absence preliminary techniques – matrixes, tabulation of frequencies, temporal schemes etc. – can be tried out to get the analysis started. (Yin 1994).

According to Hartley (2004) the data may be organised around certain topics, key themes or central questions. Then the data need to be examined to see how far they fit or fail to fit the expected categories. Use of the tables or to search patterns, or grouping of similar topics may help to examine certain types of data. Initial interrogations of the data may lead to unexpected or unusual results, which may mean that the categories need refining or that events need to be interpreted differently. One method may suggest one interpretation while this is not confirmed by another method. Questions lead to further questions. All the time the researcher must be alert to the need to draw on disconfirming data and possible alternative explanations of the phenomenon. These can be welcomed (however initially inconvenient) as indicating that further theory -building and/or refinement is required.

Ghauri (2004) the first stage of analysis, “storytelling”, can be done by writing chronologies or biographical histories of the organisation(s) or individual(s) under study. This particular important when the researcher is attempting to develop longitudinal explanations that track a phenomenon over time. The second stage of analysis is also a shifting process. This means rearranging the data that has been collected, but into more conceptual rather than chronological categories. To analyse data we often have to code them so that they can be broken down, conceptualised, put together and presented in an understanding manner. Sorting the data in this fashion is typically done through coding, in other words classifying the data. This coding and categorisation will help us to interpret the data and to relate the information to our questions and frameworks. This also enables us to locate different categories when we are analysing data to find conclusions. As qualitative studies quite often help in building theories, coding requires extra care, and a balance between creativity, rigour and persistence has to be achieved.
However, several key features of the analysis can be identified. One key step is *within-case analysis*. The importance of within-case analysis is driven by one of the realities of case study research: a staggering volume of data. The volume of data is all the more daunting because the research problem is often open-ended. Within-case analysis can help investigators cope with this deluge of data. In fact, there are probably as many approaches as researchers. However, the overall idea is to *become intimately familiar with each case* as a stand-alone entity. This process allows the unique patterns of each case to emerge before investigators push to generalise patterns across cases. In addition, it gives investigators a rich familiarity with each case, which in turn, accelerates cross-case comparison. (Eisenhardt 1989).

Coupled with within-case analysis is the *cross-case search for patterns*. The tactics here are driven by the reality that people are notoriously poor processors of information. The danger is that investigators reach premature and even false conclusions as a result of information-processing biases. Thus, the key to good cross-case comparison is counteracting these tendencies by *looking at the data in many divergent ways*. (Eisenhardt 1989).

One tactic is to select categories or dimensions, and then to look for within-group similarities coupled with intergroup differences. Dimensions can be suggested by the research-problem or by existing literature, or the researcher can simply choose some dimensions. A second tactic is to select pairs of cases and then to list the similarities and differences between each pair. This tactic forces the researcher to look for the subtle similarities and differences between cases. The juxtaposition of seemingly similar cases by a researcher looking for differences can break simplistic frames. In the same way, the search for similarity in a seemingly different pair can also lead to a more sophisticated understanding. The result for these forced comparisons can be new categories and concepts not anticipated by the investigator. A third strategy is to divide the data by data source. For example, one researcher combs the observational data, while another reviews interviews, and another works with questionnaire evidence. This tactic exploits the unique insights possible from different types of data collection. When a pattern from one data source is collaborated with evidence from another, the findings are stronger and better grounded. When the evidence conflicts, the researcher can sometimes reconcile the evidence through a deeper probing of the meaning of the differences. At other times, this conflict exposes a spurious or random pattern, or biased thinking in the analyses. A variation of this tactic is to
split the data into groups of cases focusing on one group of cases initially, while later focusing on the remaining cases. (Eisenhardt 1989).

According to Bryman & Bell (2003), one of the most notable developments in qualitative research in recent years has been the arrival of computer software that facilitates the analysis of qualitative data. *Nvivo research software* is used in this study. All interviews are entered into the programme in order to make it easier to code them. In the first phase general and wide codes are used to find a story and how it advances. Through the story a pre-understanding is found and it then becomes easy to find more detailed codes and to specify an understanding. List of main codes used in the study is presented in Appendix 3.

According to Miles & Huberman (1994) *descriptive codes* entail little interpretation. Rather, you are attributing a class of phenomena to a segment of text. The same segment could, of course, be handled more *interpretively*. A third class of codes, *pattern codes*, is even more inferential and explanatory. A coded segment of field notes illustrates an emergent leitmotiv or pattern that you have discerned in local events and relationships.

First, codes can be at different levels of analysis, ranging from the descriptive to the inferential. Second, they can happen at different times during analysis; some get created and used at the start, and others follow –typically the descriptive ones first and the inferential ones later. Third and most important, codes are astringent –they pull together a lot of material, thus permitting analysis. One method of creating codes is that is that of creating a provisional “start list” of codes prior to fieldwork. That list comes from the conceptual framework, list of research questions, hypotheses, problem areas, and/or key variables that the researcher brings to the study. It is also possible to code more freely “by hand”. (Miles & Huberman 1994).

I used both codes based on my theoretical framework and open codes. The interview questions and their themes were based on the framework, so it was obvious to use same themes in the analysis. Open codes were possibility to go into details, and code the material, which didn’t fit any category. I used memos to comment details, chronology and my own thoughts. Also field notes made during the interviews were very useful and offer support to the made analysis. First I analysed each case, when I looked for similarities from the cases. The idea was to find content for the phases in my framework and at the same time test the framework. Free codes gave possibility to find out something new and unexpected.
5.6 Evaluation of the research process

The basic question addressed by the notion of trustworthiness, according to Lincoln & Guba (1985) is simple: "How can an inquirer persuade his or her audiences (including self) that the research findings of an inquiry are worth paying attention to?" According to Yin (1994) a high quality case study is characterised by rigorous thinking, sufficient presentation of evidence to reach appropriate conclusions, and careful consideration of alternative explanations of the evidence. Theoretically trustworthiness is analysed quite complex way, next is presented details.

Lincoln & Guba (1985) extended the traditional reliability-validity issue by claiming that more feasible criteria would be credibility, transferability, dependability, and confirmability (or neutrality). Credibility is an evaluation of whether or not the research findings represent a credible conceptual interpretation of the data drawn from the participants' original data. Transferability is the degree to which the findings of this inquiry can apply or transfer beyond the bounds of the project. Dependability is an assessment of the quality of the integrated processes of data collection, data analysis, and theory generation. Confirmability is a measure of how well the inquiry's findings are supported by the data collected. (Lincoln & Guba 1985).

Seale (1999) argue for a position of intense methodological awareness rather than the two extremes of complete anarchy or strict rule following. Anarchic moments have a place within a disciplined context, emphasising principled, methodic and systematic thinking. Qualitative researchers need to demonstrate an educated awareness of the consequences of particular methodological decisions during a research study, whether they relate to the production of data or the choice of writing style. In this respect he agree with Schwandt (1996), who argues that the term 'criterion' might be usefully be replaced with 'guiding ideal' or 'enabling conditions'.

**Credibility replaces the idea of internal validity**

Credibility depends less on sample size than on the richness of the information gathered and on the analytical abilities of the researcher (Patton 2002). It can be enhanced through triangulation of data. Triangulation is important to increase the precision of empirical research. Triangulation means taking different angles towards the studied object and thus providing a broader picture. The need for
triangulation is obvious when relying primarily on qualitative data, which is broader and richer, but less precise than quantitative data. (Yin 1994). I have used a wide theory base to get a broader picture. This includes more reading than writing, because all read material is not used in this study. I have selected only references, which give something new or support existing views.

However, it is relevant also for quantitative data, e.g. to compensate for measurement or modelling errors. Four different types of triangulation may be applied (Stake 1995):

- **Data (source) triangulation**—using more than one data source or collecting the same data at different occasions.
- **Observer triangulation**—using more than one observer in the study.
- **Methodological triangulation**—combining different types of data collection methods, e.g. qualitative and quantitative methods.
- **Theory triangulation**—using alternative theories or viewpoints.

In this study is data is collected in four case organisations, and from several interviewees. The main reason is to increase credibility and decrease subjective interpretations. Observer triangulation is difficult in practice, if there is only one researcher. Methodological triangulation needs more resources. Alternative theories and viewpoints are used.

Following the logic set out by Lincoln & Guba (1985) and Denzin & Lincoln (2005), the credibility of the study’s results depends on two things: what interviewees and other research subjects reveal about their experiences. This is specifically important in studies based on the retrospective method in generating research material due to the recall bias, that is, the effect of the respondent’s memory on what the entrepreneur reports, and what (s)he thinks as being undesirable in an interview situation. The second issue is that which the researcher chooses to focus on (or not) in the study. This is an interesting point, because researcher has to find out how to tell a story. It is impossible to take all gathered material with, and also material, which is left out can be interesting. During the research process researcher makes interpretations, which have influences on the results.

Construct validity reflect to what extent the operational measures that are studied really represent what the researcher have in mind and what is investigated according to the research questions. If, for example, the constructs discussed in the interview questions are not interpreted in the same way by the researcher and
the interviewed persons, there is a threat to the construct validity. (Runeson & Höst 2009).

*Construct validity* is especially problematic in case study research. It has been a source of criticism because of potential investigator subjectivity. Yin (1994) proposed three remedies to counteract this: using multiple sources of evidence, establishing a chain of evidence, and having a draft case study report reviewed by key informants. The use of multiple sources of evidence in case studies allows an investigator to address a broader range of historical, attitudinal, and behavioural issues. According to Gillham (2000) the need for multiple sources of evidence doesn’t just mean talking to a lot of different people (although you should do that, and cross-refer) but that you should look for different kinds of evidence: what people say, what you see them doing, what they make or produce, what documents and records show.

*Internal validity* is a concern only in causal (explanatory) cases. This is usually a problem of "inferences" in case studies, and can be dealt with using pattern-matching. Yin (1989) argues that internal validity is more essential when aiming at establishing explanations and causal relations, and is not that important in the case of more descriptive and explanatory research. This aspect of validity is of concern when causal relations are examined. When the researcher is investigating whether one factor affects an investigated factor there is a risk that the investigated factor is also affected by a third factor. If the researcher is not aware of the third factor and/or does not know to what extent it affects the investigated factor, there is a threat to the internal validity. (Runeson & Höst 2009).

*Transferability replaces the concept of external validity*

In the naturalistic paradigm, the transferability of a working hypothesis to other situations depends on the degree of similarity between the original situation and the situation to which it is transferred. The researcher cannot specify the transferability of findings; (s)he can only provide sufficient information that can then be used by the reader to determine whether the findings are applicable to the new situation. (Lincoln & Guba 1985). In this study software business context limits transferability to other markets, but in software business area it is possible (for example other organisations).

According to Seale (1999) transferability is achieved not through random sampling and probabilistic reasoning, but by providing a detailed, rich description
of the setting studied, so that readers are given sufficient information to be able to judge the applicability of findings to other settings which they know.

Other authors use similar terms to describe transferability. Stake (2000) refers to what he calls naturalistic generalisation. The reader comes to know some things told, as if he had experienced it. Enduring meanings come from encounter, and are modified and reinforced by repeated encounter. Patton (2002) suggests that extrapolation is an appropriate term for this process. Extrapolations are modest speculations on the likely applicability of findings to other situations under similar, but not identical, conditions. Users of evaluation, for example, will usually expect evaluators to thoughtfully extrapolate from their findings in the sense of pointing out lessons learned and potential applications to future efforts.

Eisner (1991) says it is a form of retrospective generalisation that can allow us to understand our past (and future) experiences in a new way. Direct contact with the qualitative world is one of our most important sources of generalisation. But we do not need to learn everything first-hand. We listen to storytellers and learn about how things were, and we use what we have been told to make decisions about what will be. Attention to the particular, the case, is descriptive not only of the case, but of other cases like it.

External validity deals with knowing whether the results are generalisable beyond the immediate case. Some of the criticism against case studies in this area relates to single-case studies. However, that criticism is directed at statistical rather than the analytical generalisation that forms the basis of the case studies. Reliability is achieved in many ways in a case study. One of the most important methods is the development of the case study’s protocol. The notion of external validity is about establishing the domain in which a study’s findings can be generalised (Yin 1989). External validity also indicates the fit between theoretical conclusions and empirical data (Grönfors 1982). This refers especially to the use of multiple case studies when the study aims at making generalisations of the research findings that can be applied to a wider group of situations. Case studies are not about aiming towards making generalisations; comparative and correlation studies are more applicable for this. In case studies, the point is more to make particularisations, meaning that we take a certain case and study it thoroughly, the study is not primarily to how it is different or similar to others but what it is, what it does. Thus, there is emphasis on uniqueness, and this uniqueness implies the differences that the case has compared to others. (Stake 1995).

Thus the naturalist cannot specify the external validity of an inquiry; he can provide only the thick description necessary to enable someone interested in
making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility. As a summary, it is not the naturalist's task to provide an index of transferability, it is his responsibility to provide the data base that makes transferability judgments possible on the part of potential appliers. (Lincoln & Guba 1985).

According to Gillham (2000) natural sciences research is aimed at generalisable findings (which may have general implications for theory). But in human behaviour, generalisation from one group of people to others, or one institution to another, is often suspect –because there are too many elements that are specific to that group or institution (e.g. the causes of bullying, or low achievement, or high delinquency rates) may well not be true of another.

External validity is concerned with to what extent it is possible to generalise the findings, and to what extent the findings are of interest to other people outside the investigated case. During analysis of external validity, the researcher tries to analyse to what extent the findings are of relevance for other cases. There is no population from which a statistically representative sample has been drawn. However, for case studies, the intention is to enable analytical generalisation where the results are extended to cases which have common characteristics and hence for which the findings are relevant, i.e. defining a theory. (Runeson & Höst 2009).

**Dependability replaces the idea of reliability**

Lincoln & Guba (1985): Since there can be no validity without reliability (and thus no credibility without dependability), a demonstration of the former is sufficient to establish the latter. If it is possible using the techniques outlined in relation to credibility to show that a study has that quality, it ought not be necessary to demonstrate dependability separately.

Nevertheless, Lincoln & Guba (1985) do propose one measure, which might enhance the dependability of qualitative research. That is the use of an inquiry audit, in which reviewers examine both the process and the product of the research for consistency. According to Seale (1999) it involves ‘auditors’ in examining an ‘audit trail’ for adequacy. This consists of the researchers’ documentation of data, methods and decisions made during a project, as well as its end product. The quality of made research is important point of view, and through well-documented research it is possible to show.
A case study protocol contains more than the survey instrument, it should also contain procedures and general rules that should be followed in using the instrument. It should be created prior to the data collection phase and is essential in a multiple-case study and is desirable in a single-case study. Yin (1994) presented the protocol as a major component in asserting the reliability of the case study research. According to Yin (1994), a typical protocol should have the following sections:

- An overview of the case study project (objectives, issues, the topics being investigated)
- Field procedures (credentials and access to sites, sources of information)
- Case study questions (specific questions that the investigator must keep in mind during data collection)
- A guide for case study report (outline, format for the narrative).

Reliability aspect is concerned with to what extent the data and the analysis are dependent on the specific researchers. Hypothetically, if another researcher later on conducted the same study, the result should be the same. Threats to this aspect of validity are for example if it is not clear how to code collected data or if questionnaires or interview questions are unclear. (Runeson & Höst 2009).

Yin (1994) presents three principles of data collection, which can help to deal with the problems of establishing the construct validity and reliability of the case study evidence. A second principle has to do with the way of organising and documenting the data collected for case studies. Documentation consists of two separate collections; the data or evidentiary base and the report of the investigator, whether in article, report, or book form. The practice is sufficiently important, however, that every case study project should strive to develop a formal, presentable database, so that in principle, other investigators can review the evidence directly and not be limited to the written case study reports. In this manner, a case study database increases markedly the reliability of the entire case study. (Yin 1994).

Another principle to be followed, to increase reliability of the information in a case study, is to maintain a chain of evidence. The principle is to allow an external observer – in this situation, the reader of the case study – to follow the derivation of any evidence, ranging from initial research questions to ultimate case study conclusions. Moreover, this external observer should be able to trace the steps in either direction (from conclusions back to initial research questions or from questions to conclusions). (Yin 1994). I have saved different phases of the
research process, data analysis and made interpretations. For example interviews are saved both as recordings and writings.

**Confirmability replaces the concept of objectivity**

Qualitative research, which relies on interpretations and is admittedly value-bound, is considered to be subjective. In the world of conventional research, subjectivity leads to results that are both unreliable and invalid. There are many researchers, however, who call into question the true objectivity of statistical measures and, indeed, the possibility of ever attaining pure objectivity at all. (Lincoln & Guba 1985).

Lincoln & Guba (1985) choose to speak of the confirmability of the research. In a sense, they refer to the degree to which the researcher can demonstrate the neutrality of the research interpretations, through a confirmability audit. This means providing an audit trail consisting of 1) raw data, 2) analysis notes, 3) reconstruction and synthesis products, 4) process notes 5) personal notes, and 6) preliminary developmental information. All these are included in thick description of how the research is made.

Auditing is also useful in establishing confirmability, Lincoln and Guba’s fourth criterion, designed to replace the conventional criterion of neutrality or objectivity. Auditing is an exercise in reflexivity, which involves the provision of a methodologically self-critical account of how the research was done, and can also involve triangulation exercises. They conclude by pointing out that trustworthiness is always negotiable and open-ended, not being a matter of final proof whereby readers are compelled to accept an account. (Lincoln & Guba 1985).

One final technique should be mentioned that has broad-ranging application to all four areas and provides a base for a number judgment calls the auditor must make, for example, extent to which the inquirer’s biases influenced the outcomes. That technique is the reflexive journal, a kind of diary, in which the investigator on a daily basis, or as needed, records a variety of information about self (hence term reflexive) and method. (Lincoln & Guba 1985). I have carefully saved all phases of this research process.

Later Guba & Lincoln (1994) use a fifth criterion called authenticity, which is consistent with the relativist view that research accounts do no more than represent a sophisticated but temporary consensus of views about what is to be considered true. Fairness is through to be a quality of balance; that is, all
stakeholder views, perspectives, claims, concerns, and voices should be apparent in the text. Research should help to develop more sophisticated understandings of the phenomenon being studied (ontological authenticity); be shown to have helped appreciate the viewpoints of people other than themselves (educative authenticity); to have simulated some form of action (catalytic authenticity); and to have empowered to act (tactical authenticity).

According to Alasuutari (1995), the idea that writing is just a means of reporting on the results is a carefully treasured myth. The fact that researchers have written their published works many times over, polished the texts, asked for comments and edited again and again is not much talked about. Just about the only advice one has been offered is the worn-out aphorism that clear thinking procedures articulate texts. It assumes that formal logic comes prior to writing, which is just a way to express one’s ideas. There is basically nothing wrong with the idea of a link between clear thinking and a well-organised text, but we could add that clearing one’s text also helps in clearing one’s thinking. Talking and writing are tools of thinking and are not just ways in which one’s thoughts can be expressed.
6 Empirical study

This chapter analyses the empirical data taken in this study. This analysis of the research is based on the framework presented in earlier chapters. Value creation between the supplier and the customer is discussed in terms of the phases involved in the on-going process. Exchanges between the customers and suppliers are analysed. These exchanges can be categorized as either communicative or material. From a value creation point of view, it is recognised that customers buy products to satisfy specific needs in specific use situations. Typically these needs are aligned with known attributes of a product or service and the related supporting services connected with that product. Value offering consists of considering either the product, service, or customer relationship or some combinations of all of these.

6.1 Development

In the development phase of customer relations, intended value meets desired value. Customers should recognise their own needs and inform the supplier regarding exactly what it is that they may want. At this early point in the relationship with the customer, the supplier’s concept of what is expected on the supply side is based on vague ideas, prior generalized models of development, and experiences based on prior interactions with other customers. A great deal of development work involves research and planning. Customer needs have to be assessed within the supplier organisation before it is possible to make any kind of targeted offering to customers. Decisions on what to offer customers are based on general information obtained from the market. While this gives direction to the product development team, from the value oriented perspective, this market information is abstract. This information has to be translated into a model specific to the relevant product and service attributes which are currently in demand. In Figure 8 is described content of the development phase.
It is important to find the right partner to assist in the process of product development. Without feedback, it is easy to lose focus and perspective. Information exchange and the evaluation of ideas are a central part of the development process. In the early stage, the supplier may need to make an offer to the customer, which is based on limited information. The information may be the best that is available at the time, but making an offer without sufficient background information requires judgment and a partner may be a crucial asset in this regard. In order to make an offer, the supplier needs information not only from customers, but also from the market and from his competitors. It is in the supplier’s interest to use all of the available resources to determine the best way to solve the customer’s problems effectively.

6.1.1 Supplier’s intended value

The supplier’s intended value is based on vague ideas of what the customer might want. This is a crucial time for the supplier with regard to evaluating the possible needs of the customer. The most important thing that the supplier must do at this point is to determine what the customer actually wants and needs and make an offer based on that. The supplier must try to make a more attractive offer to the customer than he thinks his competitor will make.

Searching what customers may want

From the supplier’s perspective, it is extremely important to be customer-oriented, i.e. to be available for the customer. This simply involves ensuring that the customer has access to the supplier and that the supplier is listening to the customer’s needs. For example, updates to products and services are based on the customer’s needs. It is crucial that the customer receives these updates on or preferably before the current product or service requires them. It is also
advantageous to notice how important various features of a product are to the customer. If several customers need or really appreciate a certain feature, of course, it should be prioritized so that upgrades and anything else related to the feature are provided to customers as quickly and efficiently as possible. At the same time, it is always important to be aware of all of the relevant products and features your competitors have to offer.

"We have normal features, and if think about some release, every features and new technologies are directly by customer request… Sometimes there are cases, in which some feature blocks sales, or other competitors have something that we don’t have.” Interviewee A3

Customers can have a central role as partners in the development process. Some organisations have tried to actively involve their customers in this process in order to better clarify their needs. Active participation and communication with customers during the development process can help to avoid mistakes and problems in product design as they relate to the end user.

"We have tried to from the beginning that we have right customers as development partners. In practice, we have given little discount for these first customers, because they are a part of the development. We have bare experiences when we earlier tried to guess how some business area should work.” Interviewee B2

Another thing, which must be consider when including customer input into the development process is that while it is important to listen to customers and consider their input, it is crucial that the supplier remain in charge of product development. If the supplier relies too heavily on the customer input he may lose track of everything else he needs to consider in designing the product. The skills, training, and experience of the supplier are very important assets available in the development process and must not be superseded by attempting to do everything that the customer suggests. On the one hand, it is important to be customer-oriented and listen to customers. On the other hand, if you only consider customer input it could have a negative effect on the innovation that might normally come from the development team and other members of the overall organization. Therefore, it is not enough to listen to customers.

"We want to be customer-oriented and listen to customers and do just what they want. (...) We should look around more, so innovation, our inside
innovation mill, is also important thing. (…) This is reason why we condense co-operation with research centres and we have conversed different kind of undertakings and new things. And through that we try to find possibility to pull off. Or innovation. It can’t be forced; it comes through researching, asking and testing.” Interviewee D2

Moreover, often customers may not even know their own needs, or they may be unsure or ambivalent about what it is that they actually want. This can become a big problem, if the development team is following the input from customers too closely. Customer’s needs may be directly based on their earlier experience with products or ways of doing things. As a result, although they think they understand what is needed developmentally, they may have too narrow a focus, and the ideas that they contribute to product design may be short sited. They are focused on obtaining something that solves their immediate problem quickly. This can result in their inability to see a better solution. So, this means that the input of the supplier is just as important if not more so than the customer input. The supplier should have something to offer, some kind of pre-solution, which could solve several problems or change the ineffective way the customer may be doing things. Information can’t come only from customers, because only after it is too late to fix things, the supplier may realize that the customer’s vision of the solution that is needed was insufficient or wrong. One extreme in the development process is to push customers into the direction that is in keeping with the supplier’s vision for the solution, and another is to do whatever the customer says that they want.

“All customers have their own needs, which are based on their earlier experiences from that field. (…) But quite far, with customer we construct the requirements, with interactive communication. Of course we always try to push it to the direction we want.” Interviewee C3

On the one hand, it is possible to design the product completely to the customer’s specifications and fit the product to the customer’s vision of what it is that they think that they want. Software companies, for instance, can develop a new tool package by wiping the slate clean; if a custom designed software solution is important enough for a particular customer. It is important to know why it is important, to whom it is important in the organization, and who is the person who makes the purchasing decisions. In other words who is taking responsibility for requesting a custom product and how does this all relate to the value chain. In addition to this, it is important to assess whether or not it is possible to satisfy a
customer who requests a custom product. This requires knowing whether or not it is even possible to build the product with respect to your current operation mode? Will there be problems involved in developing it? It is important to consider if the product the customer has in mind seems good and reasonable (i.e. viable) to the development team. And if so what are its attributes and what are its deficiencies? After considering these things, is it still a viable solution worth developing?

“On the other hand, if we go to that, based on these we could tell, if we are not making software from wipe the slate clean or new consulting project, now when we know the questions, we could tell why our solution is better than others on the market. And you could impose our organisation in some way and understand why our solution costs that much and some other costs that much.” Interviewee D1

Of course, with regard to the development of products that are custom made to the customer’s specifications, it is important to consider that anything that is done from scratch will take additional time. More importantly, it must be clear between the supplier and the customer that if the customer wants to request the development of something which is not standard, that there will extra cost involved. It is paramount that this is understood and that the supplier knows exactly what the customer is willing to pay in the way of extra costs as well as if the person that the supplier is dealing with has the authority to order specialized goods. In addition, the supplier must weigh the extra unknown costs that could occur in development of a specialized product as well as the inconvenience to the development team and determine whether or not that customer is important enough to go to that much trouble for. It is often the case that altering the direction of development for the sake of one or two customers is not practical and the development plans that are in place for designing and implementing the product should not be altered. But in any case, the need to make these decisions is a serious responsibility for management and must not be taken lightly.

Making decisions what to do

It is very difficult to make a decision of this nature especially because there are so many parameters to consider. It crucial to prioritise, because there is always going to much more to do than seems possible while keeping the deployment of the product on schedule. Coordination within all branches of the organization is vital, because all actors will have their own perspective, and their own opinions.
Whether or not to proceed with the design of a given product will probably depend on how many customers want the same thing. When considering the design and specifications, it is important to assess if the design aspects being considered for inclusion in the overall product is are special features for a certain customer. If this is the case, that customer should be willing to pay additional costs for special features, which are developed only for that customer. This is especially true if they don’t want others to have the same features made available to them. Sales has the important role of making these difficult decisions. As such, the sales department is responsible for assessing the potential sales volume, and must be able to evaluate whether or not the features being considered for incorporation into the development design, will increase or reduce the volume of sales.

“Sales have an economical knowledge. Product development should be with, because they know technical risks and requirements, how long it takes time. And then the product management should be with, because they know the planned direction, if the development is going to wanted direction or are we going to some steps to the side, which demands lot of energy and resources and may not give us our money back. This is quite a risk.” Interviewee A4

"Quite less we have, biggest part of our new features are made for all, even if one has specified or hoped it is made for everyone, and often these are general and there is no reason to limit them. If some customer wants something only for them, we have to talk about who owns the copyrights and could we deliver it to someone else and then, of course, the price is different if we do something dedicated solution for one customer, which is not delivered to others. We have to do separated contract and it also become visible in price.” Interviewee A4

It is crucial to have a strategy; this will provide the guideline for design and development. Strategy provides the roadmap for development. The strategy, which the sales team provides will help the development team to know what they are aiming at; essentially it will give the development team focus. The roadmap is essential for keeping the development team on the right path. The roadmap can easily be altered to adjust to the changing needs that may arise during the development process. The roadmap is a tool, which is used to plan where to go and when. Finding the right direction is difficult work and it is largely the responsibility of the sales department to determine this direction. Although, they
are not the sole contributors to defining the direction development will take, they will most certainly have a strong influence over it.

“The roadmap is very living tool, which involved customers have influences on it, if they buy the product. If they buy, the roadmap is aimed or aims to the direction where the money flow is coming. The money flow, or assumed money flow, guides the roadmap. It guides very strongly. But of course, if we think strategy as wider route, we try to keep it inside, but if it goes outside, when we think that should we make the route wider. It has strong influence on the background.” Interviewee A5

If strategy and roadmaps give the direction development needs to go, there are also certain people, who can make decisions in non-standard cases. The hierarchy is important, because each person in the organisation has their own responsibilities. *Product managers* own products and can make decisions at some level. If there is a need for input from a higher level, the business unit leader is the appropriate person. After that, there is the *management team*. Product management guides the project and verifies that product development does things the way that the customers want them done. They oversee that the selected direction is the one that is actually being taken and make the needed decisions surrounding that issue.

“They give last accept to the product, when it comes out from product development, be tested, before it goes to commercial sales. It is related to normal alpha, beta versions and singular and system tests and configurations. Product management accepts the last with leader group. But it is product management who in practice looks at when the product fulfils the criteria and can be published. When it supports and follows product’s use by customer, as long as we know what kind of bugs there is and how we fix it to next release. It is continuing loop, to do and specify things, in practice.” Interviewee A1

Decisions can be changed if it becomes necessary to do so in order to meet the requirements of customers who have special needs. This, of course, is dependent on the customer’s willingness to pay for that. In addition, changes to the roadmap will require approval at the higher levels. Sometimes a manager will refuse to make any tailored software. But if there is a request for custom software which seems reasonable, it is important to contact the business leader and clarify what kind of problems would be involved in implementing the software and what kind
of potential advantages or profit might result from considering the development of this product allowing the organisation to comply with the customer’s request.

“I don’t remember any impossible wishes, almost everything is possible to do and most part of it customers are willing to pay, if they understand that it is their special, we don’t do tailored…We do our own product, but if someone has special need and it understands that it is special, so it pays for it. It is not a problem.” Interviewee C1

There is risk involved, especially if there are aspects to the design that customers can’t see. The management team follows the project very carefully and gives limitations regarding what will be done to develop the product. The most difficult aspect is to measure the utility provided by the product against the cost of development. The management team follows how the resources are used.

“Most difficult thing is usually that we want to do some technical change to the product, which customers can’t see. This kind of thing we should fight for. Management team could look at we do some big project, which only make quality better, on the other hand, it also shows to customers. But if we do something that makes maintenance easier in future, it has nothing direct gain. It is easier to justify new feature, which is bought immediately, but if it gives money back later, it is more difficult. It can’t be explained in Euros.” Interviewee A9

The potential value of custom software and new technology must be carefully assessed. This includes determining if the proposed technology will even work as the customer envisions it will.

“It is not wise to go to the end and hope the best, if we have decided to do. That is done quite often in the software business, when we have started the project we want to do it to the end. Only reason is, because it is started. It is quite difficult to say, if it is right or wrong.” Interviewee A9

The manager must also consider that when the developmental direction is changed for any reason, time will be lost.

“Well, it usually depends on how much time we have wasted. We have changed directions several times, and at the same time we have looked at the most of the made work could be used somehow. So we not totally lost it. Only time. But if you obstinately go to the end, you waste more time and
probably fails anyway. Is this wise or not? If you fail, you should do it quickly and cheap.” Interviewee A9

The problems that are encountered during the development process are not always internal to the organization. Co-operation with actors outside of the organization, integration with systems outside of the organization, and working closely with other systems with which the development team needs to cooperate are challenges. These challenges will have to be considered and they will influence the time schedules as they relate to the project. Outside systems can also cause extra unforeseen problems and make additional work for the design team or even stop the whole project altogether. Integration with the processes involving third party actors is not always supported, because these parties have their own agenda and want to sell their own systems instead of assisting in the design of someone else’s whom they may consider a competitor.

“When we do some kind of system, it is always some kind of integration. Seldom could we deliver system, which don’t need any kind of integration with thirdly side. This thirdly part limits very much, which are their interfaces and are their willing to make changes to their interface for some customer. Customer may want to use their data in different systems and third part says that they don’t want to open their interface. Or it may be billing interface or whatever. Sometimes they refuse directly.” Interviewee B2

“We could say that there is arm wrestling, rarely any joyfully yell that yes of course. Quite often third part says that it comes in next release we are not going to do any extra work. When we have to wait that.” Interviewee B2

6.1.2 Information exchange

First contact with customers is often a phone call. It is equally important to listen and ask questions as it is to talk. Interviewees highlight the meaning of listening. This can be done on a more general level from the market standpoint or more specifically, by listening potential customers. There is also a question list for clarifying the customer’s needs. This needs clarification is a part of sales process. The first meeting has a significant impact not only because it is the first contact between the supplier and the customer, but also because it presents the first opportunity the supplier has for clarifying the customer’s needs.
"But first meeting with the customer is the most important, it is named in our process as a “need mapping” meeting. Function of first meeting is to clarify customer’s needs.” Interviewee D2

The first person, who will make contact with the customer, is a salesman. He meets every customer face-to-face and is the person who will be asking the customer to define his or her needs. The salesperson is the first person to have information about the customers wants and needs and should be crucial to the process of defining the product and determining its specifications.

"Typically at the first phase we start doing basic clearance or definition, depending on case how extensive. Second phase is where solution format is specified to customer’s needs. And somewhat we have done, and in future we may do more market research. Clear out, ask what kind of needs you may have.” Interviewee B1

Market researches provide the development team with general information about the markets and give guidelines regarding the direction that product development is going in, as well as providing information about future directions for the product and related trends in the area. They essentially provide general information on the state of the market as it relates to the product as well as a forecast of future customer desires and trends as well as what features are currently in vogue and when they are expected to become available in the overall market.

“We listen attentively that what happens at the world and what kind of needs are getting up. World is changing and also economic situation changes, so of course we try to think actively, clarify facts before hand, that what kind of needs firms and organisation could have.” Interviewee D2

Knowing customer’s preferences is the most important basis for development. There are several mechanisms for clarifying these processes. Spontaneous information is what customers reveal during discussions and product testing. Standardisation is always an important customer preference. And sometimes the standards become obsolete, leaving customers anxious regarding what they are going to do. The customer’s needs will depend on what kind of systems they currently have in place, what they are using the product for, and what the additional characteristics are that define the satisfied end users of the product. It is important for product development to understand exactly who our customers are
and how our customers use our products. This is crucial to the development of standards for the product design. Sometimes the development team begins implementation before the standards have been determined. But, standards for operations and new releases should be tightly monitored. It is imperative that the development team get feedback and advice from the end user regarding the product. The development team should communicate continuously with customers because they can provide their evaluation of the product as well as good advice.

“Typically when our customer does something new with their own time schedule, they need before they can go ahead, exactly on time this our product to check if they have done it right. They announce to us that we need these and these features, these and these operations and interface. Our people know how customers use the product. This is product management’s work. They talk with customers, go to check and know how to do the job.”

Interviewee A1

It is important to know what problems customers may have encountered with the product and how they have solved these problems. Sometimes a concept, which has only been designed on paper, is actually more complicated to use once it has actually been built. In addition, if the product is different in any way from a similar product that the customer has previously used and is used to, the customer may have pre-conceived expectations which can become a problem in adjusting to the new product even if it is superior to what the customer has used in the past.

"How they act at the moment, what kind of technology their have in use or is it only in papers. It judges very much, how we continue. If they have only papers in use, it may be even easier for us to do. If they have some system, even for part-time in use, it has to be learned of, and that can be difficult. "We have done this before like that, could we do same way now?" On the other hand, if the old system stays in use, it causes lot of problems in a longer run.”

Interviewee B2

These entrenched expectations can cause problems when customers try to use the system without updated knowledge. Sometimes customers don’t know what they need. It is important to prioritise, look at the most important things first. It is important to build a base before adding all kinds of extra features. Sometimes customers just buy the software and expect that it will solve all of their problems
automatically. Because all organisations are different, they can’t all use same kind of software, and their needs are not all the same.

"First we have to think which are our capabilities, for example in know-how management, which are the capabilities to worth measuring. Which are strategically important, for business and so on…We ask from whole personnel, what is your strategic, how well you know our strategy and what is your strategic capability. It really shoots little bit over.” Interviewee D2

“When we only start using software, and put all information in. It handles all the information, but people have to understand and decide what we want from it, and when decide how to do it. This explains that why organisations are different, there can’t be two exactly same organisations. To all it is not as much important to follow same things or develop same things.” Interviewee D2

Inside the organisation

Internal communication within organisation is necessary for the success of any product design. There are several different channels for the transfer of information. Some routes of communication are not as direct as others, and important messages and instructions can be corrupted in the process of travelling through the organizational network en route to the person for whom they are intended. This emphasises that it is important to get information to others in the organization efficiently. The very best way to do this is to talk directly to the right person; however, this is not always possible.

“Actually the requirements, they come from product management or sales. To support they come from that way, but to R&D they come correctly from product management. For example service advices and requests for help come to support by e-mail. We make a direct contact when.” Interviewee A8

Product management has a role in facilitating communication between the customers and product development, and internally between the various members and groups that make up the organisation. People in product management are responsible for seeing to it that the right messages are delivered to the right places and that they reach the right person.
"Well, our team’s (product management) job is to respond that customer’s aspect goes all the way to product development and same way we participate in all project reviews and try to clarify that message is not corrupted in its way. As said, if requirements are not specified precisely, for example if some requirements comes from sales, first they make an assumption before they give us the information and after that we make another assumption and write it down to requirement specification and further product development makes their own assumption. Eventually it is like a broken phone, not even close the same than the customer meant with it.” Interviewee A4

Official meetings are a more formal way to share information. These meetings can be regularly scheduled and they can be global.

"Heads of the sales offices come half-yearly to here in Oulu and we have two-days session, in which at first day product management tells future road mapping, which features in which time and more generally strategy of the product line. These are at the same time feedback and conversation sessions, in which information goes between product management and sales.” Interviewee A2

### 6.1.3 Customer’s desired value

Finding the sales target involves finding the right solution to the right problem for the customer. Customers have very practical ideas involving their needs and they purchase the product for a specific use situation. Most customer problems are situation –based problems, they are looking for a product because there is something that they need to have done which they can’t do with the tools they already have. They need some kind of solution in order to do what it is they want to do. In the beginning, customers attempt to define their needs but their needs are really “want lists”, and include everything that sounds good to them. They try to find a solution to the problem, but it is difficult, because there is so much offered by the market that the customer has difficulty focusing on what it is they actually need the product to do.

Different customer groups have different needs, and often finding the right match means pairing the right customer with the right supplier. Working in this field requires having the knowledge needed to understand what would work best to meet the customer’s needs even if the customer has difficulty articulating them. It is important to be able to find common ground and understand the customer.
First, speaking the same language is one basic demand for achieving understanding.

“It is same thing, that if you sell something to me, I know my own field that what is important for me. You should position if I am the one, or if we have a good match, how well you can offer the right things. If I am not in the right segment, you try to do something else from your perspective, when I am giving impossible requirements for you. But if I am right way to chosen, when it is “yes, this is it!” Interviewee D1

Second, the more that is known about the way in which the customer will use the software the easier it is to provide the right solution. This requires obtaining from the customer the necessary information about how he or she is going to use the system. It is not enough to work in the right field, the salesperson has to know how their customers intend to use the product. Actually, it could be considered irresponsible on the part of the sales manager to sell something to a customer without knowing how that customer intends to use it.

“Often the customer asks that do you have this, we either have it or not, but we should always make sure that where you are going to use it, in which situations and how, before we offer anything. From my opinion it is very short notice that if customer asks, we just answer do we have it and not ask how you going to use it.” Interviewee A4

Third, recognizing the real needs of the customer as opposed to what the customer may think they need goes a step deeper than just asking the customer what it is that they want. The sales person must be able to determine if a customer is interested in so called completed products which are essentially ready to deploy but may require more advanced skills on the part of the user, or if he or she would prefer something that is easier to use, or if the customer really needs something specialized which demands development or even early stage solution design starting from an empty table. When the customer’s requirements have been determined by the sales leader, the technical team can be advised about any special requirements that may be necessary to meet the customer’s needs. Once the customer’s real need has been determined, the product specification process can begin. The contract for the customer’s business will then be processed and this will include the specification and pricing. It is important to document all needed information.
“Typically we offer this as a chargeable consulting work. We go through with use cases, customer, founder, and even consultant from customer’s side and after that specifying process we could give a cost estimate to customer that how much cost to make a feature. That kind of feature could be the whole system, or new feature to the existing system or it could be two in operation system’s integration with some parts. From that arises specified documentation, which can be quite long. It consists of use cases, data contents, databases, tools, reports and so on.” Interviewee B3

“And consequently in these long-lasting, bigger and why not also smaller, significance of specification arises. Customer knows what is getting and we know what we are doing and delivering. When the system is accepted to delivered, we know how long it takes to get it into use and how much it costs.” Interviewee B3

Fourth, the offered solution should be proportional to the customers needs. This involves seeing to it that resources are used effectively and time and resources are focused on the customer’s needs. As long as the project has been well defined and discussed, and both the supplier and the customer understand each other, there should be no big surprises. The idea is basically to provide quality work, which will be done properly and delivered on time. Understanding the problem thoroughly is extremely important to this goal.

“Yes, I as a solution’s salesman, see that it is a good thing if you have, at the prime time you have an axel in which minimum, perfect and optimum. I could even draw this to the customer. If you think our resources, time schedule, money and different variables and fitting these variables to the reality, we could find the optimum for the purpose. It may be good to search it at the first, but on the other hand, if we go that way, it means that we have done our work badly. If you don’t set your position right, you try to be everything for everyone, when you end up at the specification meeting or at the next phase, solution proposition meeting, you meet a herd of pink elephants, in which you don’t have answers. It is directly a result from cheating at the earlier phase. You should think why you are and whose problem you are solving.” Interviewee D1

If the supplier fails to offer support to the customer throughout the process, misunderstandings can and likely will occur. Different solutions, different features and different possibilities, are like a jungle for customers. Selecting the right
solution is impossible for the customer if they do not have the support of the sales manager, and at the very least they may be able to use the product they purchase but it will not be an ideal solution for their needs. Finally, in the end, the reason to buy a product can be one specific feature, which fits the purpose of that particular customer. There could be several other features of the product, which don’t fit at all.

"It is not easy, often it is quite difficult. It is quite comic, that in many applications is so many features that what is the feature, for example what makes it worth buying. Recently we make benchmark for that, we tried different software and get funny answers to question: "will you buy this?"

Many of them were interested in buying several applications, when they noticed that there was one in thing that was interesting and precious from their point of view. There was lot of features that they don’t understand at all, but this certain one thing was the feature.” Interviewee C2

6.1.4 Summary

One of the greatest challenges is to incorporate the voice of the customer into the design of products or services. According to interviewees it is important to be customer-oriented, and open-minded; to listen and ask what customers may want. At the same time market information and supplier’s own knowledge, should influence the purchase decisions. It is equally important to have some kind of pre-solution, idea, to offer the customer initially as a starting point for them to focus on their needs. Together, the customer and the sales person then design a solution to the customer’s problem. This pre-solution is key in directing customers toward viable solutions. The customer’s uncertainty regarding their own needs gives the salesperson the opportunity to “play” with possible solutions and evaluate the customer’s expectations. The salesperson can inform the customer about what is offered and how these products work. Knowing the customer’s processes and the way the customer is going to use the software should always be addressed at the beginning of the project.

Decisions regarding what to do are based on strategy. In practice, problems are solved through roadmaps. Product managers have the power to make decisions. But with this power comes the responsibility for those decisions. It is always a risk to do something that customers don’t fully see and understand, even if it is clear that the result will be useful to them. It is important to use resources
effectively, especially when it involves a custom order. Once Decisions regarding product design have been made, the information must be shared with all of the different departments within the organisation. The development is based on customer’s needs, and also depends on the importance of the customer, and the resources (money) that the customer is willing to spend.

Knowing customers processes, how they are going to use the software and where, is one of the main focuses for the supplier. Gathering information, discussing with customer what his or her needs are, and listening to problems are the methods used to gain understanding about the customer’s processes. It is important to be aware that sometimes the customer’s expectations can be unrealistic. The customer is not always right and sometimes they may not even recognise their own needs. They can also use the product incorrectly, so there is a need for customer support from the beginning of the project. This can mean simply offering different alternatives when discussing the customer’s needs which may make it easier to find the right solution. The goal is to find the right solution, one which really solves the customer’s problem.

6.2 Purchase

In this phase design values meet expected values. This happens on a more concrete level when customer is really ready to make a purchase and has strong expectations regarding what it is that he needs and is purchasing. The supplier must try to fit the offering to match the concrete needs. In this phase customers are given the opportunity to test and evaluate potential offerings. This is a phase when co-operation begins and the relationship between the customer and the supplier start to develop, so commitment becomes an important part of all further decisions. Purchase consists of supplier’s designed value and customer’s expected value, as in Figure 9.

![Fig. 9. Purchase.](image-url)
Purchase is the phase where legal contracts are drawn up and signed, which makes this traditionally the most important part of the process. Ownership officially changes hands, but in the software business this quite often involves licensing. Making copies of software is cheap, but developmental costs are high, and that makes situations involving custom software very different from that of purchases involving the standard product. It is important that the customer is clear on exactly what has been bought and sold. The purchase of the software is a technical and complex process, requiring a contract and involving a number of legal aspects which need to be understood by all parties. Technical points can sometimes conflict with economic issues and all of these things must be addressed. Experts are used to this situation and deal with these legal issues on a regular basis.

6.2.1 Supplier’s designed value

Eventually, the supplier must make a concrete offer to the customer. In order to do this, the supplier must determine what it is that can actually be offered that is essential to the customer’s needs. How tailored to that customer’s needs should the offer be? The objective is to win the customer, and make the deal. Quite often this requires that the supplier allow for some flexibility in pricing, but in practice the most important aspect of all of this is that the customer’s problem has to be solved. From an economic standpoint, the supplier must be aware of the added cost of going beyond the necessary requirements of the customer. The solution offered must solve the customer’s problem but should not go beyond meeting that need. There are often useful product features which are not be incorporated into the development model, because the product is planned to fit the needs of multiple customers and features which are specific to only certain customers are not included.

The actual purchase is a very technical process. The purchase department rarely shows up at the time of the purchase. If they do arrive, there are still technical people who must be present as well. The customer is presented a demo, in which the basic idea for the design and how the software works in a real life are demonstrated.

“Typical example of customer case is that there is head of the group, who is technical leader and his subordinates at the place in product presentation. If customer asks demo, we go to the place with our product and take back-to-
back demo, in which we round self-make actions or earlier recorded actions. Or we can take live-demo, in which we go to customer’s lab and hook it to real situation.” Interviewee A2

It is called a field trial, when the customer, or potential customer, is given the opportunity to test the product. In these situations the supplier must teach the customer how to use the product properly and what the product includes as well as all that the product is capable of doing. At the same time, is important to listen to the customer and get his or her feedback. Observing the customer while they test the product, gives the supplier the opportunity to see the customer interact with the product and to listen to the customers responses as they use it. It is a learning situation for both the customer and the supplier, but the most important thing is that the feedback from the customer is valuable and it may lead to increased sales down the road.

"It is quite high percentage that we get a deal after field trial. We don’t take much money of these trials, because it is probable that we sell it. It is low risk to customer, because he can test the product and see if it is right or not. (...) It is hard if we have to do this with all customers. Direct sales, in which is used data sheets and technical documentation is the target.” Interviewee A7

Testing the product is one way to see it in action, but there are other methods for implementing the hands on evaluation of the end product. In some cases, there is a competitive advantage, when the selection process is lengthy, in hiring a consultant to test various possible prototypes for the product before the design process advances to the later stages. The decision to have the product undergo experimental testing often depends on how well early design concepts work and how much time design alterations will take to complete. Complex purchasing process demands a consultant who has enough experimental experience to properly test and analyse the prototype product. The requests for experiment and analysis, which are agreed upon between the supplier and the consultant are quite exact. They include feature lists, and sometimes at the end if all of the requirements the supplier has given the consultant are not met, in this case, the offer is ignored and the contract is void.

"Public government especially uses consultants a lot in these offer requests and it is long process with all documents before we meet face-to-face. (...) It was first time when candidates selected with short correspondence and requirements specification, which are capable of delivering needed
Quite heavy demo environment should be organised at the first day, there was six people to estimate it. Next day we had negotiations, with almost same group we had long list and after that comes final, when customer build final request offer based on the information.” Interviewee B3

Often the customer is open to the idea of widening their perspective, regarding the product especially if they have done things the same way for many years. It is difficult to make a choice between several similar offerings, especially if the customer is unclear about their own needs. In this phase listening is very important, but understanding how the customer intends to use the product has an even more significant role.

“When he is focused too tight on doing some way and when consulting sales and supplier’s expertise become considered and even rewarded. Most often customers are grateful for listening. Purpose of all these six suppliers is to offer several possibilities to solve the problem, when the customer only knows that he wants that but really can’t say how to do it and what else is dependent on that.” Interviewee B3

The role of the purchasing department is two-fold. They are interested in economic considerations, but have little understanding of technical issues. Making the technical considerations clear to them is important, and of course, it is necessary to negotiate the costs related to the technical needs while keeping in mind the economic concerns of the purchasing department. It is important that everything involving the costs is made clear to all parties. It has to be clear to everyone who will have the final word, i.e. who is the person who will actually make a selection. The supplier, who offers the right kind of tool, becomes the one who will make the sale. The purchasing department may say that they want the cheapest item available, but the technical people have the final word.

“We are not very happy when they come to the picture, because they are most boring people who try to set competitors against others, try to get them play against, bargain as long paying time as possible and economical delivery conditions. Typically it is most unpleasant situation. We try to have influence on user group, so technical leaders and practical users, because the real needs come from there. (…) If they say that it is really bad and we don’t want it, because we can’t use it, so technical group get what it wants, or at least the next cheapest one.” Interviewee A2
Money is an important limitation. Another important resource is time. It has to be determined beforehand what is going to happen, and what the time schedule involved is. It is possible to give key customers roadmaps, in which they can make plans for the next half year. Therefore, features can be updated and sold continuously even before they have been completed. This is risky because if design and production deadlines are not realized as planned, serious customer relation problems can develop. The entire product does not have to be delivered all at once. It can be given to the customer as modular parts. It is more important to have each part arrive on schedule than to have everything delivered at once late.

"For example, customers have to know at the end of September, what they need and how much it costs. (…) It is continuous battle, because if the feature is too late in our roadmap compared to competitors, customer can select competitor’s product based on that competitor has it in January and we have in March.” Interviewee A2

6.2.2 Financial exchange

There is a pricelist, in which the product is divided into components. All regular customers are given the same price. Certain key customers have more important status; they are offered a certain discount, which is negotiated between the supplier and that customer. In each case, the price is unique to that customer. Every customer’s case is different, because salesmen have a little leeway, which means that they do not need to adhere slavishly to the price list. If there is pressure to decrease the price; the salesman has the authority to do this. Typically this leeway is 15 per cent. If the customer tries to bargain for a larger discount the salesman can take the situation to the sales manager who will make that decision.

“Sales management estimates the case, how potential customer is and what influences discount has to our other pricing. They accept discount or say that this end here, we can’t give more discount. Our sales management’s statement has been in recent years that we don’t loose trades because of the prices.” Interviewee A2

Price competition is quite rare. More software-based products have more leeway, in practice, if the variable costs are noticed. It is little bit different, if the fixed costs are taken into account too. Working hours are quite expensive and have direct influences on the price. Of course if the timeline is longer, these costs have
to be covered as well. Variable costs are quite fair and should be kept in line with those of competitors, at least according to the analysis.

“We have been very aggressive in price competition, if some competitor goes under our price, we try to decrease ours. (…) We can’t go under our primary customer’s price in any case.” Interviewee A2

According to interviewees, pricing decisions regarding the salespersons leeway depend on the company. The decision to negotiate a discount for a customer will depend on how the price has been set up in the first place and how much work is required to make price adjustments. In addition, the salesperson must evaluate how useful it will be to offer the discount to a particular customer. The offer of the discount could increase competitiveness.

“To more customer-oriented systems’ features we do… If we see some good idea, which is not too expensive to do, we estimate if it increases our product’s competitiveness so much that we sustain to do it with only product development costs.” Interviewee B3

Price can be based on the pricelist, but it can also be based on the number of users. The rule of thumb is, that when the customer wants some extra features, it costs extra. And of course, upgrades will cost more as in these cases as well. If the system is designed specifically for a certain customer’s needs, and it can’t be used anywhere else, this will be very costly.

“We have quite wide scale what we deliver and how we deliver, but product like ours has often basic price list, for example it costs that much in a month for that many users. If customer wants existing feature, it costs that much extra and some other that much and so on… It is fully specialized system, which is made for certain customer, so we can’t sell it to someone else, because it is not working. And customer could have some kind of legal ownership for the product, as long as they want to keep it their own.” Interviewee B3

*Price can be flexible.* One way to find out how important the product is to the customer is to determine what the customer is willing to pay. Larger companies have more resources and are often willing to pay more than smaller customers, so depending on the kind of customer different prices may be offered.

“It is constructed modules, and every module has basic price plus amount of users, it solves. The smaller house is the lower price and the bigger house, the
higher price. We pursue in our pricing to value based pricing. That means the price is flexible. Even if we have price list, which gives us a user based price, the price can give up or down based on the value for the customer. Because the value can’t be exactly measured, so it is best guess of how bad your pain is. Our assessment, how much you need this and how much you are going to have utility. And what customer tells us about how important and how much they get; we fit our price in it.” Interviewee D2

Determining what to charge each customer is a challenge. The price must cover the costs and still be within a range that the customer is willing to pay. Pricing based on measuring the utility is even more difficult, especially if the customer doesn’t see all of the needed aspects that went into the product design. This makes negotiations difficult.

"In some way, it leads to value based pricing at the end, that if you as a customer think that this is too expensive for us, so you have some rationales for it. For example our need is so small, we can’t get much of this and our utility is only that. If we believe you, when we can talk about it and try to find arguments, which increase your utility. In some way we increase the value and get customer to trust to bigger value and based on that pay more. It is very interesting; it could be even worth researching.” Interviewee D2

The explanation of the overall price should be based on calculations, which make sense. Evaluation of how much implementation is needed to deploy the software on the particular system may increase the price. The price quoted to the customer is still only an evaluation, it is important to make clear that this is not a promise.

"It is related to core dilemma, if we can’t show to our customer that ROI is. We can’t show the calculation, that hey, by investing to our solution, it costs 50 000 to you at the moment, but by that, that and that, you save that much in a year plus you get this and this based on this, you incomes increase that much. (...) We could make our pricing based on two years payback time.” Interviewee D2

The price can be based on the estimating how valuable to system is going to be.

“If you can’t measure value, how you can base your prices for that. So it is based on feelings, you believe in something, you negotiate and make your best guess. If the answer is no, it is impossible, so we start negotiate. (...) Customer explains why the price is too high. It really is value based, he is not
willing to pay that much because it is has no value and we try to explain why it should be paid.” Interviewee D2

**Image is a factor, which is based on feeling.** This supplier’s reputation has a definite influence on the price. If the customer has enough money to buy the best the market has to offer, the size and image of the supplier will have a significant role. The biggest supplier may provide nothing but the best, but that supplier will also be the most expensive.

"Yes, the quality has influences on, everything has. Everything affects, so our image affects on how customer see us. We are experts, but we are not probable high-end product. But if some big customer with a lot of money wants to raise their profile, they may not buy our product, but they buy from market leader and pay 20 times more. If they want real solution, agile good solution, with reasonable price, they buy from us. If they want save money and only do the job, they buy from some little pump. So it reflects.” Interviewee D2

### 6.2.3 Customer’s expected value

The customer’s expectations are based on the promises made by the supplier. If the supplier has promised too much, the customer will be disappointed. So, it is important that the promises the supplier makes are realistic. At the same time, the supplier is under pressure to make a more attractive offer than that of his competitor. This is why it is really important to keep in mind that the customer is not really interested in all of the many excellent features the product has, he is only interested in having his problem is solved.

Buyers are professionals and often play poker with their offers. They try to get the best offer and sometimes this means that they don’t even notice the first one.

"I haven’t think anything else than another supplier, they try to play poker, if another may sell for that. And sometimes they have someone else in mind, and that is a fair play. They have in mind, that they have at least two rounds time to play, because supplier never take off the first offer, so they don’t have a risk and they can go back to it. It is like buying a car, you should walk away once from every shop after first offer. After second offer you could think that
what they offer, so the logic is the same. But buyers are professional in this, and we car buyers are only amateurs.” Interviewee A6

If a customer is very angry with their old supplier, and wants to make a change, it is typically very easy for the next supplier to get his business. There are situations in which customers have directly said that they have fought with their current supplier for years, and that they have had enough. They want to look somewhere else.

"Of course we try to be strong where the competitor was not succeeding. When there in the organization, is extremely strong change resistance, though they don’t like the earlier product, they don’t want to change to new one. To learn how to use it, it is concrete cost to organization, but also they could have developed test-scripts for the old product with earlier supplier, and now they have to do it again with another. When we have to negotiate that what price and could we take any price, we may even take the costs, if we believe that the deal is going to give us more than it costs.” Interviewee A2

6.2.4 Summary

Customers are pleased, if the supplier is able to widening their perspective and help them determine the difference between the various offerings. Purchasing is often a very technical situation and professional buyers or even consultants can become confused. For the supplier, it is important to find out who really makes the purchasing decision. This is because technical features are the main reason the person decides whether or not to buy the product. Professional buyers don’t know the technical aspects of the software very well, so it is possible that the real reason to buy is something else. Factors, which have influence on the price, could be difficult to measure. What is the real utility to customer? For example, the needed working hours and number of users the software can accommodate may have an influence on price. Also, the company’s image may have an influence on the price, because customers want to select the market leader, even though the product offered has a higher price. Customers trust the market leader. The test situation is an extremely important opportunity for the supplier to learn how the customer will use the product, and at the same time it is an opportunity to make the sale. For customers it is provides an opportunity to learn what kind of features are included in the software. The customer tries to get the best offer, and can even “play poker” i.e. bluff the supplier in order to get it. There can be reasons why the
customer is willing to change suppliers, recognising this makes it easier to focus on making the right offer.

6.3 Use

Received value. This is a period of first use of the product and service combination. The Customer gets experience with the use of the product and gives feedback to the supplier. The supplier’s task is to support the use through the entire period. This means that all problems have to be solved and all bugs fixed. This is a time for close co-operation, so the personal relationship that is in place between the supplier and the customer is important. Usability is important. It will determine how easily the customer will reach his goals and it will determine customer satisfaction overall as well. One important aspect is to make sure that the customer learns how to use the software correctly, which demands that training be offered by the supplier. Basic exchange in use phase is product or service exchange, as presented in Figure 10.

![Fig. 10. Use.](image)

The customer starts using the product/service and getting the experience with it. Hands on experience using the product is very important. Even if the customer has already used the product during the test period, when the product is installed on his or her system, there may be problems that were not encountered during testing. The use period is really “the moment of truth”, because it defines the future of the whole relationship between the customer and the supplier. Actually, it reveals how trustworthy the supplier is.

6.3.1 Supplier’s received value

When the product is in use, customers still need additional help. This is a time for support, when the supplier tries to make the use of the product as easy as possible. The target is that the customers not only use the software, but also that they are
satisfied with it. Unsatisfied customers are more willing to change their supplier, and this constitutes a big risk to the supplier.

Often customers know what they want because they have used an older version of the same product. When there is a problem, if the customer has used the product in a certain way in the past and the new version is not working the same way, this can cause the customer frustration. They need to know how to use the product to get the desired outcome. This kind of situation can be alleviated if there is a support group, and they answer the customer’s questions by e-mail or by phone and give instructions as to how the customer needs to proceed in order to properly operate the software now. The most common way to provide this support is to answer the customer’s questions by e-mail or by phone, rarely is it necessary or desirable to send the support group to the customer’s place. There is a need to prioritise problems, and this can have an influence on product development. The problem can be inherent to the customer’s own environment, but whatever the case, it has to be solved.

“When if there is some bug or critical problem, customer can’t use the system and we can send someone from our support to clear out the problem. (…) The critical level is that customer can’t get over it and can’t use it at anyway, so we have certain response time how soon we fix that kind of critical bugs.”

Interviewee A2

If the problem is prioritised and determined to be critical, it demands reactions at the product development level. Of course, when the time schedule is tight, and help is needed right away, it is important to get connected with the customer immediately. For global organisation this is easier because the product development may be closed in several countries but open in others. Some problems are possible to resolve over long distance, but quite often if they are serious, someone must be dispatched to the customer’s place.

“We can do fixing patches, which are not planned beforehand, like gap releases, if critical problems are found continuously. Our other product’s side people do a lot of work in support through web-ex, so they open connection to customer’s vehicle and drive customer’s system. This is most used support way.” Interviewee A2

“We have operations primarily at three places, here in Oulu, in India we have 100 product development personnel, and in USA we have little product development, but more it is product management and one sales office. This is
our triangle, in which knowledge is quite dispersed. It is important to work at several time zones.” Interviewee A2

Help desk –systems using head users are one way to decrease personal face to face contacts. The number of remote contacts involved can make things more difficult in trouble shooting situations. The most important thing is that trouble shooting processes be organised.

"It works by phone number, which we give to customers. Now we have done this at new way, we advance customer’s service offers to help desk –system, which either send e-mail to certain address to generate it in help desk system or starts help desk to his own desktop and write down service offer.” Interviewee B3

Head users can be the only group, which uses the support. It is possible that the supplier doesn’t even know the end users and all contacts is made with the customer’s organisation. This means that in practice, the customer’s organisation has to offer support to end users. In practice, head users need education in order to operate in that position.

"We educate our head users individually. Or system’s head users and when there can be some certain software module environment’s head users. For example heads of recruitment make recruitment campaigns and recruit people; they have their own training sessions. There can exist different kind of user groups inside the customer organization, each of them have own head users.” Interviewee D2

Customer support is a service that has to be paid for separately. It depends on the made contract how much it is offered to fix the bugs that appear in new features.

"It is a component, which can be bought for a year that is like maintenance contract in practice. If we do something bigger, for example in our world we talk about computer protocols, there can come some little polishing at the protocol level, especially in new things should be fixed and of course all our own repairing. All this comes through care to customers.” Interviewee A5

"It is usually electric ticketing, what we use, it works through our extranet. Customer has to login there, and he gets some rights, based on what he has bought from us. (…) After that customer has rights to do support requests to our system, often request is made by e-mail and in phone we go things through.” Interviewee A7
If the solution is specified for each customer, it is extremely important to have head users who know the solution almost as well as the supplier. When the head users have problems, according to the support and maintenance contract, they have the right to use phone support. The same thing can be done through the extranet system. The support is one way to deepen the relationship and understanding between the supplier and the customer *where when and how the customer uses the product*.

“If we understood something wrong at the sales phase, or customer notice after the product is get into use that we could do this differently. Through this we get customer feedback and we can develop our solution. If we should do this more traditionally by using development payment and support payment, even when focus is tightly on that customers tell us what direction the development should go and the systems goes for it. It is important that we have this head user level, not the whole organization, not all user groups, because we organise it that way.” Interviewee D1

It often depends on how the customer uses the product as to how soon help will be needed. Sometimes there is a need for a duty officer, who answers the phone 24/7.

“When necessary. We educate when it is necessary, especially in implementation phase, but also later if it is needed. We have duty officer, phone number, for our own solutions. It works 24/7 and gives support. We market is that it is in office time, but we have mobile, which circle in so called duty officer cycle. In practice it is 24/7 with them, if there is some big emergence.” Interviewee B1

The best way to reduce the need for support is to develop the product with the end user in mind and give good instructions and documentation to the user. This means that the user’s perspective is taken into account during the development phase.

“We have first level support, if there comes escalations; they go through normal support process. There is second and third level support, and at the end they go to R&D, but these are very little. In practice we have tried to, through usability that customers have less problems. When we have tried to have high quality support material, all little tips, and short installation guides
that you don’t have to take the whole manual in your hand. When we have product manual. When we have online helps in our products.” Interviewee C2

**Understanding reasons to use**

At the basic level, the size of the customer will have an influence on the manner in which the product will be used. The most important aspect will be the number of personnel who will be using the product. This dictates many things, and if enough users are involved they may have the collective know-how to fiddle with the processes. If technical assistance from the outside is required it will cost extra. But technical assistance contracts are not usually purchased for groups having less than 50 users. This consulting service, if purchased will help with assisting users in adjusting to the new software. But this software service is not very useful for small organizations where it is probably cost prohibitive. One criterion that it is often looked for by bigger organizations is growth rate. For example, is the organization in the incremental stages of rapid growth? If this is the case, support for software may not have kept up with company growth. The company may not have any information technology personnel available to help the user. So, the growth rate is important to note, because it causes changes in how companies need to do things.

“It is possible to grow to 50 people without them, by taking care of legal matters, counting salaries and doing bookkeeping, it keeps business going. But after that, you need some support. On the whole, it is some kind of break-through.” Interviewee D2

In the same manner, if there is some kind of crisis in the organisation, the need for outside help can become extremely important quickly. In these situations, the supplier has to be well informed and know the field.

“For example after two organizations are joined together or some organization absorbed to another, or in some case in break-through, there becomes big downsizing, we should send lot of people out, these are places where outside help and implements are needed.” Interviewee D2

Customers can even be forced to use the product. They have to use it, because their own customers want to have an objective perspective. This kind of product can offer a checkpoint that to insure that the product is working right.
“Essentially reason why there exist outside suppliers, is that they need objective checking point. These products work as an objective checking points for that they do things right. Our end customers are operators who use systems from several suppliers. They can’t offer products, which could measure others elements. That is reason why outsider is needed. This outsider can be supported from both suppliers, and offer tools which measure how well these different systems work together.” Interviewee A1

Another perspective is that users may start using the product by accident. They don’t need it, or don’t know that they could need it. If the user interface is easy to navigate, the software may remain in use.

"We have noticed quite many users, who are not trying to solve any kind of problem, or they even haven’t notice any problem. They just see the here is some icon here in their new phone, what happens if I click it. When they start it, possible activate the application and equivocate it. When they notice that I do nothing with it. They don’t have any interest for it. This is some kind of other user group. First is the one who search actively some kind of solution to that certain problem.” Interviewee C3

Training

If it is possible to get educators and end users together, that is best way to show how to use the product. At the same time, additional needs will become apparent. This offers an opportunity to sell more products or get tips for new features.

"There is two ways to do, and same way than sales and specification phases, our way to operate is that best way is to get our educators and end users together, because there could get up some extra needs for development, and for us possibilities to sell more. On the other hand, direct feedback from users, if we understood things right and if the system looks like customer and use, right for the use situation.” Interviewee B1

Significance of the training should be taken seriously, because it gives valuable information regarding future development at the same time it assists the user. It is a learning process.

"It should be a learning process. You should be that kind of humble that you listen and learn, if it is needed, but not that humble that you give always up,
these are two different things. You should value time with customer for at least two reasons, not only because they have money for us or they could give us money for some reasons. But because we can learn from customers, and we can hear some things about our product, and we can give information about our product. That is the reason why I was quite willing to ask if I could send educator or offer training with deliveries, because I valued it for two reasons.” Interviewee A6

The ease involved in software deployment depends on the system. If the browser is clean browser and has no specialized devices associated with it, then loading the software can be really easy. The customer gets an address and proceeds to login and enter some basic information into the system, which they have learned to do during training. Training can take place over the web, but it has to be done before the first actual use.

“We have video meeting connection that we deliver to the customers, so it is possible to use or some educator goes to visit the customer. If getting system to use demands, for example configurations or it is client-based solution, which demands some operations at the place, we have people for that.” Interviewee B3

**Updating**

There are often no old releases of software in use, because the new ones have more features and so have replaced the old ones. These new features make new releases more attractive to customers, but customers have to be well informed. It is possible to get new updates automatically, but often some kind of training or consult work is needed for a smooth transition to the updated software. Updating is one way to take care of customers and offer new features, which have added value.

“Always when we meet a customer, regularly, we tell what the new release includes and how it could make value for them. This is one way to do business, make relationship deeper and get new sales from current customer by telling how it is developed and give possibility to update. New versions offer possibility to educate, strength head users’ know-how or to consult, because we have, at least 60% comes from service delivery and much smaller
part comes from software. Percentage can be increased even bigger in recently.” Interviewee D1

The most important limitation is the number of users. If they all have different version of the same product, it is impossible to handle them all. It is important to get all of the customers in a given organisation to use same software versions.

"If we think that we have less than 60 customers, but tens of thousands users in the customer organisations, it is easy to tell because we visit there each year. We try to get our customers during 18 months to use the same version, and quite much it goes that way. If we look this from product development’s perspective, we have done over 10 year’s agile development, but we haven’t use that name. We have new version in every six week, and we have to think that what is going to existing and what is going to new version. There is can’t be very old versions in use. The oldest one are age of 18 months, or younger.” Interviewee D1

It depends on the product, how often an update is required and how these should take place. Some mobile solutions can be updated automatically. In these cases the normal routine is that all deliveries include some customer fits or tailored work. When the update is some kind of project, the changes are made and put onto the systems. If the update needs some to have some actions taken by the user, it is important to make sure that these will be easy enough.

"We tell customers that next time when the system asks, update. This means that new features or operations get up. Our doing is primarily project work, when we do updates for customers. It comes some need to do some changes, we do and delivery them, when it is taken into use and may be educate. We don’t have version launches that now it become new version and now become these new features, and here you go.” Interviewee B1

In the case of more tailored solutions, they demand more work and can cost more money. For wider deliveries, customers can decide what they want. When they get an estimation for how much it costs, the customer will have to decide if that is prohibitive or if they want to upgrade.

"We give approximation of how much it costs to do, customer accepts it or not, but not in life cycle’s end. Of course there are change situations, for example operating system, data base or something else come to end of support period or it is end of life product, when we need to start changing
project to move things to new platform or environment. We do that. Essentially they are our own made and mean extra work for us, so we wish that customer has these needs and we could continue the development.” Interviewee B1

Updates can be installed onto the system very quickly.

"In practice we have one portal, which all use, or one system. It has different interfaces, through that customers are integrated. We are integrated to customer’s direction from one interface, when a customer has a portal, which he can use from the web. End devices take with their own protocol contact to the same system. When we make updates, it has at the same moment influence on all. The portal has updated operating system, client get new protocols or new things to use and interfaces change and so on. It is direct influence. We don’t have any delivery chain or production.” Interviewee C3

There is a need to get new releases at least a few times a year. There are also situations when there is a need to make bigger changes.

"Normal cycle is that we have two releases at a year. And when we have updates, if needed. We don’t have many updates between these. We have a challenge that our application is not light and facile instead it is deep in the customer’s operating system. It is under way all the time. May be we should offer updates for users little bit more active.” Interviewee C2

The support can be bought separately, at least for a year, and it includes automatically updated specifications and all actions made in the product during that time. So buying the product in this manner is cheaper than to buy each update separately. This kind of support is like buying a licensed file, which makes it easier to get all of the latest versions. If the license is too old, it won’t cover the updates anymore.

"When new release come, e-mail is send automatically for people who has wanted to get it, plus we have own contact person for all bought products. We send information to him, when we have new product, which you can install from web, here is needed address, click and give login. And when the end user can visit web, he can login to our web, we check which organization he is from and give him needed rights. He can load it and when make new installation and copy license file from old version to new one and if it is work space file, it configure file to it and it seems like old version, but you have all
new features in use. If there is no care anymore, it checks when the release is made, which it is going to start, if it is made after the care, it won’t open it.” Interviewee A3

Sometimes the information is not reaching the right person. The message is sent to the contact person, but it is still possible that the users won’t receive it. When there is a problem message during a visit, it is important to check and see if the version is old. These situations happen quite often, but of course they are dependent on the customer. For some of the customers this is more important to look for than for others.

“It happens quite a lot, but it depends on the customer, if he is an operator customer, in which network technology is not changing very often, it may not have a need for it. In network developer’s side requirements change all the time, they wait the new version if they know that in it is something they need. They take it into use right away. I have noticed few times that someone has the old version in use. Contact person is someone else than the end user, and sometimes information pokes to that contact person.” Interviewee A3

At the end, the customers will decide if they want to change to the new version or not.

“We talk about a year release, and try to update it either once a year or after every two years. Or customer updates, because he decide to take it or not. It influences some costs, for example installation and education costs. We try to get new version in use to all customers. It increases customer satisfaction, because software is developed. Old version may not reply to today’s requirements. If customer is not satisfied, it is possible that we have a solution for that, but customer should take our consultant to update it and pay a little for it.” Interviewee D3

Usability

Usability is an important aspect, which should be taken into account from the product development level. If the users could be part of the product development, their opinion could have great importance to the process. They may see little things, which have a lot of significance for improving usability.
“It is very important, if usability is bad for people who use the system in the organization, it kicks to co-operation and to supplier. The purpose is to get users-to-be be part of the product development. If we advance only by management and leaders, and take into account only their views, when we take it to use in organization, and they view can be really different. In every case it has meaning.” Interviewee B3

“There are so simple things, miraculously simple things. When application is normally loaded to device, when we have to restart the application. People don’t find it, where it is installed. If they haven’t installed very many software to mobiles, they really can’t find application. Based on that feedback we did auto-start-up, to start it automatically after installing it. These are little things.” Interviewee C2

Ways to get feedback from users can vary a lot. For example usability reports, research, and different kinds of tests are widely used. The most natural way to obtain feedback is during development. It is easier to correct problems during the development stage. According to interviewees, the customers have best perspective with which to evaluate usability. Often the development follows from the customer’s point of view. It takes much more time to make changes after the software is in use.

“When in projects we go with customer’s instructions, this looks fine and that has to be changed (…) maybe we should have more courage to say that this way. Quite often we have had projects that some system is delivered and taken into use, when customer has needs to change, update, move that and organise things little bit differently. Quite often usability things concretise in interfaces.” Interviewee B1

There is a lot of talk about modularity, so products, especially component parts, and also interfaces, can be sold in this manner. When something is done, it should be done in modules, because it is easier to build new implementations and also change existing ones when software is designed in this manner. This also improves usability, production efficiency, and rationality. It has to be noticed, that even the aesthetic appearance of the front end interface will have an influence on the usability. If the interface is well built and attractive, it stands to reason that it will be more comfortable to use.
“For someone it looks better, for other it is easier to use. I have emphasised visual, that it is clear and beautiful interface. Especially if we talk about our mobile solutions, which are used in moving work, their interface has to be simple, clear, easy to perceive and use. There can’t be even close as many elements as workstation with us sit down to work” Interviewee B1

Different user groups see usability in different ways. It is not equally important to all users, for example if the product is innovative, the usability is considered secondary to the innovation. Usability becomes more important during the development phase where it should be being constantly evaluated.

“If we talk about usability as how easy it to use, how well it offers solutions for problems, or whatever you mean with it. If it is in maturity phase, it is important separation factor. On the other hand, if we talk about early phases solutions, which we sell to visionaries who want to dismantle it and see how we have done it. Usability is important for different customer groups in different ways. When there is use experience, and customer intimacy thinking come more important when we advance.” Interviewee D1

“We have inside organization user experience team, which is our usability team, is within our all projects. When we use outsiders to do research and give feedback and comments. And we do research precisely with end users. It has been very eye widening experience, and gives us biggest wow-experiences. Little things that ease people.” Interviewee C2

6.3.2 Product and/or service exchange

Some products are easy use and customers can install them by themselves. Sometimes the customer has ordered a total product, like a computer with all of the software installed on it. This kind of delivery can take more time, for example it may take a week just to arrive. If the customer has ordered only software and a card, the card should be hooked up to customer’s interface, so it collects the data to analyse. If customer has ordered only this card and software, they can install it on the computer and it is possible to get it to work quite easily. Some product delivery is more like a project, in which a deployment team will be needed to install it. Delivery is made at the place, and typically it takes at least 3-5 days to install it. Times can be even longer, if the customer wants training or development.
work at the same time. This development work could include for example test cases.

"We send them basic set of test cases, in which can be driven scenarios of what types of testing is planned to do. Is there a need to do stress tests or some kind of operational tests, and further what kind of operational tests. For example one basic test could be that we first call a phone and when cut it. If customer wants something more complex cases, we could do test case development work to them, but we do it for extra price and it is like different order. Related to this deployment can be very long and our people are at the place a whole time or at least often.” Interviewee A2

"Our product delivery is made in a box. It could include adapters related to what they have bought. They can install it. It can be portable, hooked card or basic pc card or measure card. Software can be delivered electrically. Updates are electric. This kind of package is delivered. Software, key and data collection part, in which is also server package. It needs only power and few basic configurations to work. Another product is more project delivered, people goes with it and could do several weeks there.” Interviewee A7

There are different kinds of user groups. What kind of delivery is most suitable often depends on the user group. There are several alternatives.

"It depends very much on the operator or the route. Best, and more pleasant for end users, are these pre-installations. When the user takes the system to use, it is possible to find from device. And then the user takes it in use. When we have these Web and Wap deliveries. Somewhat operators have campaigns, they send promotion message by SMS, which have a link for service page. When we have firm sales for organizations. And resellers do something. And web stores. When we have some retail business, which is not very interesting as a route, it is this traditional box. The box is more challenging, because it is more dependent on user, and threshold may be higher.” Interviewee C2

"And when we have these different bundles. Operators pack services, for example one operator has a fun example. They have note card with little application through that is possible to install other applications. It includes especially for active user some utility applications, for example timetables, which they can use. And one component is security. As a part of bigger
combination one application is worth more than as a one application. In that kind of systems is wise to be with.” Interviewee C2

Sometimes the offering is so service-based that it doesn’t need any installation.

"We have had it at least five years as a service. There is no need for installation. We have service centre as a partner, who offers the service. We open the login and it can be used after it is into use so it is consulted and trained and think about contents and so on. Technically it can be used as service. Often customers still want it to their own servers.” Interviewee D2

Another option is that the supplier doesn’t sell the software that the user needs. It is so tightly connected to the service faction. If the customer is really big and has enough resources, it is possible to sell software to them separately. Most often the answer though, is no.

"We don’t sell pure software, because it is not useful. Customers don’t even ask it. Well, there is exception, if we talk about very big organization, over 1000 people, or at least global organization’s unit. When we get closer to selling the software, because they have big human resources department and consulting know-how. They have needed understanding, so we have customers, who we sell the software. Biggest part gets the overall service with consulting.” Interviewee D2

What needs to be done to set things up, varies a lot, based on the customer’s needs and what has to be done, before a so called completed product can be installed and used. The project can last years, including, maintenance and development. If the product is easy enough to use, it can be considered a complete product. It is installed on to the customer’s PC, and it can be in use the next day. Another issue involves products, which needs a lot of development work. The first version could take several years to develop and the development work may be on going. The first version is not a so called completed product, and it possible that there will never be a later version. Time estimations are based on the several years experience.

“Time schedules are some classics in this field, which are going to stretch. This stretching happens, because management of change is not controlled. When we have little bigger project, the prescription starts after we have done specification and started to make iterations with customers. When we can have problems with estimating changes, that how long they take time. We
could tell customer that this takes a month, when we estimate that it takes few
days or weeks job. Quite well we can, next year we have operated ten years
and some of the people are still the same, they have experiment to say how
long it takes to do based on specifications.” Interviewee B2

Integrations to someone else’s system take time, if they are not planned carefully
before hand.

“Changes during the process cause a challenge and time schedules stretch. At
the moment we have projects, in which some third partner’s interface need to
be integrated. It takes a lot of work to go through all interfaces and specify
and do, when there is going to be delay, for example if the customer has not
enough big leverage to twist their partner to do things in time. It is important
to settle things beforehand, because during the project they cause delay.
When time schedule breaks down.” Interviewee B2

The time schedule can change, but if the reasons for the delays are know, it is
possible to have some influences over this. It is more pleasant for everyone, if the
time schedule is estimated correctly and problems are solved right away.

“Then if we are received to do stand alone – application, it is easiest; we do
specification without any changes. I don’t think that we have mistakes that
we estimate working hours wrong. Phases take time, delays come from
working with other stakeholders, interfaces and changes. Then where is that
we should keep tighter, or do with some agile method, with scrum, that when
we have a goal, we can go to it by bouncing and look at with customer that
how it goes.” Interviewee B1

Taking the product an using it may be easy and customer can may be able to
handle it by himself. But sometimes it is more complicated, and more time is
needed and someone may have to be hired to assist with it or do it. All this must
be considered when there are different kinds of product and service combinations,
especially with complex product deliveries. In practice, if the product is easy to
put into use, it can be delivered in a day. This requires that all components are
available in the warehouse. In the case of software, the delivery can be made by
e-mail.

“Typically in upgrade cases, in which customer has some hardware in use, we
could update it during a day. Essentially we promise to deliver it in four
weeks, but I dare to claim that we could deliver it in a week. We are top of the
industry that we have really fast delivery times. This concerns only one of our products, because another is more challenging. We could deliver them also in a week at the moment, I checked this yesterday, and our production promised that. This is quite big solution, which should be constructed. We can’t take it from the shelf, it demands work from our production.” Interviewee A2

6.3.3 Customer’s received value

The use starts from the motivation. The customer should have some motivation to use the product, if they do not, the customer won’t use it. From the supplier’s perspective it is important to know what that motivation is. For example the use experience is secondary to innovation.

"In our case it is, that users are worried about their security in mobiles, because they don’t know new technologies, techniques and different threats and everything related to it. In PC-world users have used to firewalls and malwares and when they have a need in their consciousness:“what about security in this side?” It wakes an interest for the product and when the product has to fulfil the need in users head. It has to have an excellent use experience, which fulfils the need. If it is not worth it, users don’t use it. Motivation is at the first place, but when the use experience comes.” Interviewee C3

The product should include features, which the customer needs. All products do not necessarily include all needed features, so often customers have to buy several products to solve all of their problems. In some markets, it is more important that the product is focused on to the desired purpose. If it fits the need for some other work, they don’t want to use it, because it is not specialized for that work. The product can be used for different purposes.

“They could have some special need, which should get done. Our product may not include that specific feature, which some else has. They have to buy them both. We could have something else, which is equally important. Or inside the customer organization in the different departments, they use it for different purposes, so it is possible to move from place to place and even for different purpose. These figures can be quite complex occasionally.” Interviewee A5
“In U.S markets they are really pedantic that they buy right product for right purpose. If we think about our product, how we keep eye on mobile networks, if they want to, for example stock exchange wants to watch stock exchange time delays, the technology is the same and they could use our product. But when customer sees that this organization makes that kind of products usually, they think that wait a moment –this can’t be right for us. The product can be used to measure delays, but if it is not our main job, they don’t believe it. We should have all our product materials in different versions, which should be focused on different kind of use purposes. Same product can be used in different ways.” Interviewee A9

Selected products solve problems, but the product must be used properly and installed correctly. It is not enough to have the product on the system, if it is not used correctly. Often the software just supports the processes and does not change them. So, recognizing the processes that the software is designed to support is a crucial part of everything.

"Best of all, the most concrete example is the CRM- system. All the things related to customer management. Organizations have done for years that if sales not visit, sales is not working and sales management really don’t know what salespersons do, they don’t get reports and can’t follow the pipeline. When we take CRM. We take software and force people to write down all the things and believe that this solves everything. In the real life it goes different way. At first we should work out with sales, when we repair the process and do things with paper and pen or excel. Until we notice that this is our way to do. This goes to better results. When we could take some software, fit it into our process, to support it. Not another way, that first software and when fit our processes into.” Interviewee D2

### 6.3.4 Summary

During the use phase, customers still need help. Suppliers must try to help with support for the group. Problems can have an important influence on the development level. Solving problems are easier, if they are prioritized. One possibility for reducing the need for support is designing the software with usability in mind. The number ways to offer help is based on the choices made by the user as defined in the contract. How much support and how many updates are included is specified in the contract. Customer’s size and growth rate influence
how support should be best administered. Customers can even be forced to use the software. On the other hand, they can use the system accidentally. The focus is to insure that the software will be easy to use. There are different ways to deliver software. Updates can be delivered automatically or on demand. In the case of tailored systems, updates demand more work and can become extremely costly. Usability should be noticed, addressed, and built into the software at the development level. Feedback from users should influence the design and development. It is important to be aware that usability means different things for different user groups. Customers have unique reasons to use the product, and that is what will determine their motivation and purpose.

6.4 Evaluation

Perceived value. This is the time to evaluate what we have done right and what we are going to do in the future. Satisfied customers are willing to stay with the vendor. Customers gain experience using the product not only from direct use, but also through the support of that use, and based on that they will evaluate how satisfied they are. They can learn from consequences, what went right and wrong. If social bonds are tight between the supplier and the customer, and a relationship of trust has been developed between them, the customer is likely to have a high level of regard for the company and the way it operates and a high level of satisfaction with the product and services. These relational aspects are extremely important, when the long-term goals of the supplier are considered. This is a time for the supplier, to think about future and new versions of the existing products. Totally new products and even new business areas are also matters to consider. The relational aspect should focus on changes in the future product and service attributes as a result of evaluating the user’s experiences and the relationship between the supplier and the user as a whole. Interaction consists of social exchange in the evaluation phase, like in Figure 11.

Fig. 11. Evaluation.
Evaluation is a phase, which is easy to forget about if everything goes well. Customers order with regularity and there is no need to be pro-active. All of the little problems have been solved and there is common understanding and involvement between the supplier and the customer and the relationship between them is stable. Silent customers are not the easy ones, because they may actually be unsatisfied and planning to change suppliers. Silence should never be taken as approval. There is an ongoing need to be pro-active in communication with customers and collect feedback on a regular basis. Only through taking action of this nature is it possible to prevent or at least minimize unpleasant surprises.

6.4.1 Supplier's perceived value

This is the time to evaluate current and future situations. If something is wrong, how it is possible to correct it? Quite often, the biggest problem is not the problem by itself; it is the reaction to it. The supplier’s role is to fix the problem, before it grows too big and influences the relationship. Feedback has a significant role in the evaluation. If customers are not happy with something, it must be dealt with very quickly.

*Feedback and how the supplier reacts,* this is especially important if something has gone wrong. System development should be long-lasting and handled directly for the customers, also technical teams should operate in close co-operation with customers.

"In customer interface sales is a primary actor, but when in long-lasting system development, which we made for customers, there is technical production teams’ leaders to work in close co-operation with comparable from customer’s side. They get primary feedback in these cases. When if something gone wrong, and even leaders have heard about it, when it comes to leaders, in that phase I, and other leaders, hear about it. But actors are the comparable pairs in organizations, who work in tight co-operation.”

Interviewee B3

The amount of feedback can be very significant, especially if there are tens of millions of users in the global market. Problems in systems have *wide-ranging consequences.*

"When we have globally tens of millions users, there comes feedback. Our products are difficult application, because we have to stop operating system
and when we have to stop browser’s actions, and very quickly these combinations cause situations where software crash. Especially if there are not constructed malfunctions good enough, errors emerge through our program. This is very challenging. If we put wrong update, we do these several times a day and if there is not tested and validated enough, we get quite easily all devices to stick. Risks and quality requirements are very high compared to any other application area.” Interviewee C1

Documentation plays a significant role in minimising problems. For example CRM-systems have to be used, when the information is collected and it must be stored somewhere. Most often feedback comes from the sales people. Positive feedback should be passed forward in the same manner as negative feedback.

“Quite often they call to salesman or project manager. We write down some of them, we have CRM-system, where we write things down. If there are even bugs, errors in program, we put them all to our bug database and when we have to repair, put them under way, and document them. More general feedback could stay in the persons’ heads, if they get the feedback that something works well or badly. Sometimes positive feedback is even remembered to tell forward. Often this kind of feedback comes from sales, when salesman calls to customer or customer calls to salesman and tell that everything goes well. This should be expanded forward. But these bug fixings and other more detailed feedbacks we document that we remember take care of customer ship.” Interviewee B1

There is a need to build communicative relationships with user groups, then the feedback will be there without any need to ask for it.

“We could say that by building. Not only that organization build sales funnel, you should also make customer ship funnel, and determine it, when you get feedback without need to ask. But if you don’t do it, when you get it only by asking. You should have active and communicative connection to different user groups. Otherwise you don’t get feedback and when you are easy to replace supplier, not partner anymore. It is nothing bad to be only supplier; it is strategic decision to be.” Interviewee D1

The process involving how to customers treat the customer is clear. They can use either local support, in which customers have their own contact persons. In essence, claim the problems. Another alternative, is global support over the web,
Extranet, in which it is possible to write the problem down and have it answered is another option. The customer will receive an answer in a day. Repair, or whatever else is needed, can be sent as a patch, if it is important. This is one file, which replace the problem part and so the problem is fixed. Of course, the same patch is sent to all customers, at least it will be included in the next release.

"When we see that customer has found the bug, which have wider influences, when we make patch release and inform everyone that new patch is available from there, if you want to load it. When it is possible to make release, as a repair release. It has formal release number, it is not like a patch, and it goes automatically for everyone. It includes repair and some new features. In practice, it may be every quarter when new release comes, and it goes always to everyone. If some certain customer needs, may be even two customers, need repair, when we make a patch. When if there is more, we make a real release, a patch release, which is for certain customer. It is possible, that one customer, who has claimed, gets it now and others after two months.”

Interviewee A3

Plans for the future

Future sheets have to be filled in. Often it is the sales or product managers who will do this. Sales have to grade the potential of each feature, and assess its monetary value. These future sheets can come from several directions and several places. When something is assessed with a high monetary value, the product managers can assign it a higher priority. Product managers have their own meetings, where they decide which features will be included in new products and on which time schedule it is possible to build them. Sales need this information provided by the product managers in order to make offers. Another version is the so called wisemens’ club.

"We have also wisemens’ club, which think beforehand and try to envision what is going to happen in future, and how our product has to work. We have proceeded to new product generation during two years. We made big specification, which we start wipe the slate clean to our product concept. I think that view comes strongly from our own people.” Interviewee A2

Information comes from sales, but also from the organisation. Knowledge has grown during the years, as customers become better known. This means that
information changes into knowledge and based and that knowledge is used to find better solutions. *Employees’ experimentation* is one very important point, because they really know how to do things.

“Sure it is based on earlier customer feedback and also competitor analysis that how competitors have done it, but still I feel that there is some new thinking. We have people who are worked in product development long time and they have seen how customers use the product, they have visited in customers’ labs and they know the use area. Often our product development starts from that our product development engineer think that how we could do this, technically, without any clue how to use it in practice. Sometimes there come smart insights, because it is not got caught on how we have done it earlier, but based on how we could do it. Sometimes it comes totally imperfect, because there is not any idea what customer wants from the feature. When it is more like lottery, but I know that they do like that sometimes.”

Interviewee A2

It is difficult to forecast several years beforehand, because technology develops so fast. There exist some *general lines* to follow.

“Well, not for very long. Often we know clearly for a year’s doings that we have that kind of project going and we need that kind of devices to it. If project has started, when we know more detailed. But if we think two or three year forward, it is quite difficult to say anything. Of course we can see general lines, for example after two years we start IPTV-services and we want to test it. We can give technological guidelines, based on these it is possible to conclude that if these are going that way, maybe we should do also that way. But not very detailed.”

Interviewee A9

Mobile security is the market, which is in its early phases at the moment. Organizations *have started to notice the significance*, when their employees work outside the company. They still use e-mails and confidential information in the same way they did in the past on the PC. So it is probably reasonable to assume that mobile has the same needs as the PC.

“*If PC has all kind of security programs to get it protected, and when if mobile device has same data, we could imagine that it is as precious at mobile than it is in PC. It is quite much as a driver, there. But when in the*
consumer side, there has been problems someone, in some countries, in some networks. And of course, consciousness grows bit by bit.” Interviewee C2

Someone’s threat can be even someone’s new business area. Especially because mobiles services cost is low only a Euro or two. But if there are enough customers, this will generate a good business.

“The more it is talked about it, the more it comes more important. Threat seems to be quite calm at the moment that everyone is going to develop something new. Last week we had these SMS –links, when you click the link, you started service, which costs few Euros. Especially chargeable services are bothering in the mobiles, because it is so easy to put in mobile something, and it is so difficult to check that it is something harmful. It is most awkward in these that these are so little per user that people don’t bother to react. But if there is 10 000 or 100 000 users, who had paid few Euros, business logic start to be at the place.” Interviewee C2

The market grows, when the customers become aware of their needs. The job is changing and it is done more often now in the field. There is no need to come to the office in order to deal with paperwork and faxes, these are possible to do with mobile systems.

”This mobile work theme is what we want, it is our peak. We have done from 2004 to logistics product development work and some deliveries. It has not flown as we hoped, but needed know-how advances and we have loaded this year and next year. We search from mobile work’s support system our own growth and widening for the markets, for future and even for international. They are certain field service management-solutions, for example to caretakers, maintenance, security, cleaners. We take operation management to the field and put operations to be part of the job, software and systems, so there is no need to do separately it at the office, no need to go back and forward and still have needed information with.” Interviewee B1

The strategy guides the future plans. Recognising one’s own strengths and using them in positioning things for the future is important. It is important to recognise also one’s limitations, this includes evaluating how much it is even possible to sell, how many customers are in the selected market, and what resources are there available to use.
“Our strategy is going through operators, but we are market leader in amount of operators, who deliver our applications and for end customers, may be over 200 ISP as clients, if we take into account mobile operators that are very important strategy. This kind of strategy should notice by Finnish product companies, that if we work globally, so distribution is crucial. Of course there comes product’s quality and other things quickly behind, but we have in sales 750 people, organising global sales other way is totally doomed. It seems that game firms have it naturally, how they get products distributed globally, but others have fanatic optimism for how much they can sell by themselves.

Interviewee C1

“We have defined it in our strategy that we want to be the main partner to customer. All things, which are related to people’s leadership, they ask first from us. We want to be trusted advisor for customers. If we don’t have best possible solution for customer’s problem, we could say that this is not quite our case, but we know some firm, some person, who is specialist for that, so could we contact them and ask to contact you. We would be at first, like contact point. Same way than a lawyer, you don’t have to think every time that who is the right person to solve this IPR-case, because you know the lawyer. He is trusted advisor, and you can ask him all things related to law. If the case is not in his special area, it is not a problem. He tells us who is capable of doing this kind of things. We want to get same kind of position.”

Interviewee D2

6.4.2 Social exchange

Long-term relationships are easy. This means that there is no need to be very active in sales. Long-term customers make orders regularly. This kind of situation is based on hard work and well –cared for relationships, where trust and loyalty are at the highest level. The supplier’s position is so strong that customer makes an order, when the need something. This is an optimum situation.

“This is the optimum situation in that kind of long relationship, orders come while needs increase. Of course we try to foresee customer’s needs; we have development meetings based on assumed technological changes. Or when we talk about how it is gone with our product, what kind of feedback their user groups have given, is there something critical, what we could do better, so we try to influence on future.” Interviewee A2
In practice, trust is seen in every day work. For example customers give their time to tell how they use the product and also how to make it better. This means that they have to give highly confidential information about their own processes.

Firstly, when customer wants to tell us, he has to tell about us his own processes that how the product is used. This is deeply related to his own development work, which is highly confidential information. Secondly, if the customer is bothered to give us time, it is certain sign of trust. There sit five person two hours to tell us how they are advanced with us, it is big cost for organization that used time.” Interviewee A2

Communication has to take place regularly. Meetings with the biggest customers should be weekly. Of course, if something happens, meetings can be held more often.

"Connection with our biggest customers is weekly, at least monthly. In especial cautions, if there is some maintenance, deployment or development actions, and contacts are tightly. When we have CRM-system, we put where all incidents and contacts with customer. When we call to customer, we open the CRM and look at customer information, and even make a memo. If someone else has to contact customer, he could check conversations, phases, incidents, offers, orders and so on. If we call to ask how you are doing, when we don’t need to do memo.” Interviewee B3

Trust is based on keeping promises. It is important to offer service, offer new features and stay connected with the customer. Also customers, who are silent, have to be noticed. Contact can be a phone call or a visit.

“We keep our promises and our service is working. What we have delivered works, our support works and we regularly offer more. May be the most important element is continuing connection to customer. Also when customer is silent. Yes, we have regular connection and we have named persons, who are in respond. They are not always from sales, but they can be consultants. Every person has from ten to twenty customers to responsible, which include regular contacts. How it goes, is there anything I could help? These are normal phone contacts. At least once a year we have a meeting, which can be status check. This is free and we just go and tell what new is happened. This is information exchange, customer can tell us what is going on, and it is
customer service and always sales is in the background, we try to get satisfied customers and more sales.” Interviewee D2

"We don’t call to end customers, but these big customers; to them we call very often, almost daily. We have for every big customer several key account managers, who take care of that customer. We get feedback from end customers through them and when we make different researches, focus groups we make quite often in different product areas, but also wider inquiries we make twice a year. This means all our primary markets.” Interviewee C1

Sometimes problems stand out and even big customers can be lost.

"It happens occasionally, for example in this area we lost a big customer. We fight with tooth and nails for it a year, and it was a big disappointment to loose it. It was at the same time certain kind of victory, because we were very badly behind technically, but we came close to them. Customer said that it was very difficult to make a decision, because we sprint so much and they appreciate very much our sprint.” Interviewee A2

Relationships have a lot of significance, especially in problem situations. One reason is that big investments have already been made by both parties.

“Long relationship can stand more, it can’t be stand like that, but if there comes knocks, long relationship can take it much better compared to new one. And of course dairy cow is the best. One thing is that Euro from long relationship is coverage better, because all big loadings for development are done and there are license payments, maintenance and development for it. They are important.” Interviewee B3

When the customer is lost, the battle is not over. Contact with the customer may earlier help in understanding why the problem developed.

“We didn’t give up, we try to listen carefully what happens and if the competitor screws up even a little, we be first at the place. Customer has devices from both, so we try to update our existing devices to new to show how well, what finesses we have and how well our product works. Battle continues, but we lost the customer at the moment. These are very bitter disappointments, not only for sales, but also for product management. In this certain case stability and quality were the critical aspects, so we know where we have to load more. Product development gets feedback for work they have
done in recent half year. It was real place to learn, for all of us.” Interviewee A2

One interesting new channels for feedback are different forums. People discuss things freely and both positive and negative feedback is easy to find. Of course, if negative feedback cumulates, it will require action. Following these web forums is important.

"Actual customer satisfaction research. We have done a campaign sometimes, based on SMS, including few alternatives, which we have asked answers. We have get few hundred messages, it has been quite good sample. We have checked that what is general style to answer and get feedback from there. When, web forums are surprisingly good source, people comment quite freely, both negative and positive.” Interviewee C2

6.4.3 Customer’s perceived value

Customer satisfaction is based on the expectations the customer has at the beginning of the process. Compared to these expectations customer should feel that their use experience is at least equal to what was expected. If the product performance exceeds expectations, the customer feels very satisfied, but on the other hand, if it remains below expectations, he feel dissatisfied. From the supplier’s perspective it is interesting to see what the behavioural outcomes will be. The best customer is not the silent customer, instead it is the communicative one.

"Actually, best customer is not satisfied customer, it is some innovative, which has courage to challenge own inside ways to operate. It has courage to challenge us to think. (...) It is nice to hear how good we are and how well we do things, but that kind of customer is not necessarily the best, if we think about our own progression.” Interviewee D3

"Active, constructing, challenging, and co-operation are the best. There could be even lightning sometimes, but still in constructing. This is best kind of customer ship.” Interviewee D3

Dissatisfied customers can be very loud just before they leave. The relations between supplier and customer must be tight. In practice that means that it is easier for the customer to stay than it is for him or her to leave. Satisfaction has to
be measured, so the supplier knows how satisfied customers are and what the biggest problems are.

“Usually customer, before leave, alert or shout for it, because switching costs are quite high through practical learning and so on. We do regularly customer satisfaction measurements, typically in January every year. We implement it by asking from sales to who we send, who is right user direction. We emphasise that we don’t want only friend-users, but also more problematic cases. Sales has to consider that if someone has said that we don’t want to hear from you ever again, should we send them, or it may be interpret as little nasty. I have taken quite raw sample of all kind of users. Something like 300 or 400 customers are in it, and we offer little carrot for them to keep answer percent high.” Interviewee A2

Close relationship with customers and keep in touch are other possible tools. If something is already known, there is no need to measure it.

“We don’t measure it at the moment. It is more like a feeling. Our purpose is to make customer satisfaction research, but not just at the minute. We measure it that when salesman call to ask how the project went. This is quite systematic customer satisfaction research without any inquiry. It is more face-to-face communication between salesman and customer, or some of our team leader, project manager and customer; we make sure that everything goes well.” Interviewee B1

Listening is not enough. Action must be taken to react to and repair the problems before they grow too big. If something so called alarming comes up, it has to go through at the organizational level especially sales and R&D because they hear the problems first. Information should be shared with everyone related to the situation. Sometimes there is a need for more service.

"We keep up knowing how customers are reacted to the release and share information; we have in R&D meeting very day at ten. We handle customer information, which has worked well and which hasn’t. Sales send it by e-mail, if they get good comments from customers or something goes wrong. We keep up assessment of customer satisfaction. It is not so organised than yearly research, but they are not so concrete. It is more important to have direct contacts, where we discuss and visit. During the visits we try to get more
service to customers, ask what they have like of new releases and so on.”
Interviewee A3

6.4.4 Summary

Collecting feedback is not enough. The more important thing is how the supplier reacts to it. Problems can have wide-ranging consequences and relationships can even break down over what started as a simple problem. There should be a clear process in place for how to obtain feedback. Building communicative relationships is the best way to find out how customers think about things. Information for future plans come from customers through sales, but also employees’ experiments are worth noticing. Development is fast, changes are quick, and the market grows constantly. At the same time, customers become more aware of their needs and this opens up new business opportunities. Once decisions have been made they should be followed through the organisation to the strategy level. Trust must be present in the organization everyday. Communication of ordinary and even highly confidential information must be shared. At this phase, the relationship is strong, and there is no need to be active in sales, because the customer orders regularly. It is very important to keep promises, because they are basis for trust. User experience should be equal with their expectations. Disappointment is always a risk and can’t be tolerated for long. Satisfaction has to be measured regularly and all possible problems should be solved. It still is possible to loose the customer, but that doesn’t mean that the battle is lost.
7 Discussion

This chapter suggests changes to the software oriented collaboration value model based on the empirical research undertaken as part of the study. Most of these changes employ theoretical perspectives to expand the possible ways in which the value-creation process can be described. The dynamic nature of that process and more concrete activities lend themselves to less abstract, more concrete definitions of value. At the same time, they create new possibilities for examining the value-creation process and how it is constructed. Theoretical implications supported by the research are reflected in this study, which also offers, in the form of managerial implications, practical suggestions for the software business and those who work in it.

7.1 Changes to the model

The revised model presented here incorporates the results of both theoretical and empirical analyses undertaken as part of the study. The theoretical pre-model used in the empirical analysis ran up against few competing issues. A supplier can influence a customer’s perceived value in several ways, for the purposes of both increasing and exploiting it. Value is created in the course of interactions that provide the basis for long-term collaboration. Collaboration is characterised by such relational factors as trust, commitment and open communication, all of which tie the actors closely together.

Development is the first phase of the process model. It initially comprises vague ideas about what the customer may need. The focus is on clarifying these needs and making them more concrete. The supplier constructs pre-solutions to simplify the selection process for the customer. The pre-solutions offer the possibility of pushing the customer in a wanted direction while still allowing the supplier to address the customer’s wishes. Decisions on how to proceed are based on organisational strategy, roadmaps and, at the lower level, the product manager’s decisions. The market is another important source of information. The supplier tries to develop processes for learning about customers. As a cumulative process, information-gathering is important from the outset. The development phase is influenced by the supplier’s understanding of the customer’s use purpose. There is room for the supplier to play with the customer’s expectations in an effort to beat competitors, but promises should be kept. Customer expectations provide a basis for future evaluation of experiences. The supplier has to do a lot of work
that customers can’t see, but this preparatory work can have a direct influence on value by, for example, affecting quality.

*Purchase* is the traditional deal-making phase. From the supplier’s point of view, this is the time for a specified solution. An interesting question is determining precisely how customised a solution the customer requires. The second step is to differentiate the solution from those of competitors. The customer makes a selection based on offers received, and may want to test the product. Testing offers an opportunity to explain included features to the customer and to learn how the customer uses the system. Testing also allows for customer organisation. Given the nature of the enterprise-solution system, the purchase phase is more technical than economic. It is still an appropriate time and place for cost-benefit analysis, however, because the customer seeks to obtain the best possible deal. Establishing a price is a natural outcome of the process of making a contract, which can be very complicated. It is important to identify the person who actually makes the selection, because experts and consultants concentrate on price, not technical features. Price can be flexible, but resources are expensive. Working hours, for example, have a rapid impact on price. Negotiations can elicit the reason a customer wants to change supplier – a potentially important piece of information.

*Use* plays an extremely important role in the process, because use generates use experiences. Use experiences are cumulative, and should be understood on two levels: the “moment of truth”, in which the customer evaluates a supplier’s actions and – most importantly – reactions; and the long-term experience of use (for example, how well a software product meets a particular need). The supplier must prioritise the user’s problems and find effective fixes for them. Customers use software for a reason. Understanding both the reason and the use purpose is the key to supporting use. Assessing usability during the development process increases ease of use and decreases the need for support. Training should focus on correct use: If the customer uses the system incorrectly, it can’t serve its purpose properly. Developing new features makes a solution more attractive and increases the ways in which it can be used. Depending on their size and complexity, updates can either be automatic, or require some action from the customer. If they require a lot of work, they can incur extra costs for the customer. Offers of updates and new features are based on the terms of the contract, as well as the size and duration of the customer’s order. Maintaining daily contact with important customers increases sales opportunities. It is important that suppliers understand how and why a customer uses software, because any problems that
arise may be due to the way the customer uses it. For example, problems can arise when rapid organisational growth forces a customer to adopt new work processes. The customer must find new ways of doing things, and the supplier should help with this.

*Evaluation* is considered the appropriate phase in which to engage in social exchange, but in practice social bonds start to develop from the earliest phases of the process. During the evaluation phase, the parties must determine the basis on which their collaboration will continue. The supplier *evaluates both current and likely future aspects* and their influences on the situation. The importance of temporality is easy to see in this phase, because *past experiences are included in the feedback*. The Internet offers new channels for feedback, and they should be exploited. The supplier should seek feedback from customers, because it is a good way to determine their satisfaction levels. Another way to *measure satisfaction* is through questionnaires or everyday communication. Customers’ use experience should meet or exceed expectations; if the customer is disappointed, it is always a problem. Disappointed customers are easy to lose, and difficult to win back. One reason suppliers lose customers is a complacent belief that the social bond is stable and does not require maintenance: “They have ordered regularly for years, so we don’t have to do anything.” This is a very dangerous way to think, because customers follow the market too. They can easily become aware of a change in their needs, and decide they want something new or different. Suppliers must be bold and innovative in planning their future.

What keeps supplier and customer together? One obvious answer is their history. A relationship develops strength over the years, and can become quite personal. Trust and commitment affect adaptive behaviour, and vice versa. Collaboration allows the supplier to become familiar with a customer’s processes and, as a consequence, offer better solutions. The resulting situation is a win-win exchange that works well in practice. Customer involvement makes possible faster and better decisions to support the development phase, as well as a better level of understanding when problems arise. In the case of enterprise-solution systems, customers become easy lock-ins. This kind of software can be integrated deeply into their systems, so that any change causes big problems. Of course, this requires a lot of time, money and other resources. It is not so easy to change supplier, especially if the supplier’s market position is strong. For example, large organisations’ requirements are often too big for small suppliers to handle. The amount invested is a significant component of the monetary value of a relationship. The amount invested in a customer can be read as an expression of
the customer’s importance. If the customer is a large organisation, its significance is easy to grasp and requests for new features are more accepted.

What if something changes? My study supposes a dyad relationship between supplier and customer, but they are not alone in the market. Competition can be fierce, with very little separating competitors’ offers. In fact, it is often difficult to differentiate offers at all. There are several possible outcomes to such a situation, as my empirical material presents.

First, one of the partners – if the relationship is sufficiently involved to be seen as a partnership – may opt for change for a specific reason. If the customer has been disappointed for a long time, and the supplier hasn’t done enough to address the situation, the relationship can fall apart. By the time a customer leaves, the problems should have become obvious, so reasons can usually be identified. On the other hand, the supplier might decide that the customer is too difficult to handle, or that their needs are not in line with the supplier’s strategy, or with innovations the supplier wishes to pursue.

Second, the two organisations’ positions might drift apart. Both have their own partners and customers, who influence their decisions. If their plans diverge, it could be difficult to stay together. Close co-operation by the customer with the supplier’s biggest competitor, for example, could impact negatively on the relationship. Both have their own worlds, and fitting them together can be challenging.

Third, change could arise from developments in the technology. A third party could offer something more interesting that better meets a customer’s needs or that offers a different way of doing something. The customer might be dealing with several suppliers simultaneously or using a supplier’s software in multiple ways in a variety of situations. Use purpose is the most important factor in the value-creation process, and there could be several “right uses”. Some customers want software developed specifically for their own use purpose. Others find imaginative new ways to use existing software. In times of change, existing technology can be rendered obsolete. Software has a limited lifespan, and experience needs to be channelled into efforts to forecast the future. Understanding users’ experience over the course of a piece of software’s lifecycle is the key to gauging value.

Ultimately, assessing value involves both rational judgment and subjective feelings. Client organisations formulate their evaluations by comparing created expectations with experience. The cumulative nature of this experience has a direct influence on satisfaction. Customer-perceived value is created, co-produced
and delivered over time for as long as a long-term win-win relationship can be sustained. During this process the focus moves from evaluating separate situations to the relationship as a whole. A strategy of co-operation aims to establish, develop and maintain relationships. In practice, supporting use experience forms the basis for successful collaboration. Diverse ways of working and communicating are learned and collaboration itself increases understanding. Employees of both organisations play important roles, because communicative relationships are built at a very personal level.

Table 4. The revised software oriented value collaboration model.

<table>
<thead>
<tr>
<th>DEVELOPMENT</th>
<th>PURCHASE</th>
<th>USE</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFTWARE SUPPLIER</td>
<td>Intended value</td>
<td>Designed value</td>
<td>Received value</td>
</tr>
<tr>
<td>Vague ideas about what customers might want</td>
<td>Specify an offering</td>
<td>Service</td>
<td>Updates</td>
</tr>
<tr>
<td>Technical and managerial decisions: strategy, roadmaps, information from customers and market</td>
<td>Customised solutions</td>
<td>Delivery</td>
<td>Support use</td>
</tr>
<tr>
<td>Construct pre-solution and processes for learning</td>
<td>Should be differentiated</td>
<td>Prioritise</td>
<td>Support use</td>
</tr>
<tr>
<td>INTERACTION/COLLABORATION</td>
<td>Information exchange</td>
<td>Financial exchange</td>
<td>Software product or service exchange</td>
</tr>
<tr>
<td>Technical: get to know customer’s processes</td>
<td>Quantity of money: price is flexible</td>
<td>Core of exchange</td>
<td>Build trust and loyalty, confidentiality</td>
</tr>
<tr>
<td>Economic: play with expectations</td>
<td>Person who selects</td>
<td>Technical knowledge</td>
<td>Information</td>
</tr>
<tr>
<td>Organisational: inside, to partners and to customers</td>
<td>Investments</td>
<td>Time schedules</td>
<td>Social bonds</td>
</tr>
<tr>
<td>SOFTWARE CUSTOMER</td>
<td>Desired value</td>
<td>Expected value</td>
<td>Received value</td>
</tr>
<tr>
<td>Recognising own needs “wants lists”</td>
<td>Selection based on expectations</td>
<td>Experience of using software</td>
<td>After use experiences, satisfaction</td>
</tr>
</tbody>
</table>
7.2 Theoretical implications

The main purpose of this study is to determine how value is created in a software-business context. More specifically, it is to assess the contribution of collaboration between supplier and customer to value creation in the software business. The purpose is presented in the theoretical framework of this study. This chapter presents the main theories and their connections to the research. The first step is to examine exactly what is meant by value, especially customer-perceived value. The second step is to discover how value is created and how to recognise it. Value is created when a supplier and a customer collaborate, develop a relationship and value offering is realised. This study focuses on this process as it exists in circumstances where everything goes well; in practice, a crisis can put an end to it at any time.

Traditionally, purchase – the point where total ownership changes – has been identified as the central point in the value-creation process. The situation is totally different in the software business context, where use is the central point. This study takes the heart of the process to be the use period, and how well use experiences satisfy customers. The software product can even be in use before it is bought, and when it is bought, ownership might not change.

What happens before, during and after use? The temporal dimension of software use has an interesting effect on value creation, because it increases cumulative, longitudinal values such as experience, learning, knowledge and investment, which themselves have value effects. Future-oriented “sustainable development” demands that both short- and long-term effects on value have to be taken into account. The final result is not the most significant, because also the journey matters. Next is explained more detailed what this means.

Value creation

Anderson & Narus (1998) see value as the worth in monetary terms of the technical, economic, service and social benefits a customer company receives in exchange for the price it pays for a market offering. By this definition, value is the worth in monetary terms a customer firm receives in exchange for the price it pays for a product offering, taking into consideration competing suppliers’ offerings and prices (Anderson et al. 1993, Anderson & Narus 1998, 1999). As Anderson & Narus define value, a product offering’s value and price are independent of each other, whereas – at least in business markets – the value
provided nearly always exceeds the price paid, with the difference being the so-called customer incentive to purchase. In this way, price and value can be seen as the two elemental characteristics of a product offering. (Anderson et al. 2000). In this study price negotiations are seen as lawyers work, when they try to get the price lower. At this moment the deal is already made, and there is only legal actions left. Reason to price can be that the product is innovative, it includes new technology or the development costs are high. The price can be lower for some customers, because they are more important or have more power in negotiations. The most interesting finding of this study was that one of the case organisations use value-based price setting. The idea is to find out how important the offered solution is to the customer and set a price based on that. It demands tight negotiations, but it is working.

The product offering consists of product-, service- and relationship-related benefits and sacrifices (Lapierre 2000). In this study, the offering is presented as an offered solution for customers. There is a need to offer pre-solutions to help with selection, as well as more specified solutions, before a deal is made. The role of service must be emphasised here, given the importance of support to the enterprise-system solution business. It is virtually impossible to sell systems without a service component, so product and service are more accurately seen as parts of a whole than as discrete entities. Solutions need to be flexible, because during supplier-customer interaction the flow of information increases and more specified needs are identified. The solution becomes more focused on particular needs of the customer; a process the supplier might express as “We can take care of your problem.” Service includes support during use. First, testing offers an opportunity for the supplier to learn how the customer will use the software. Delivery and installation offers a second opportunity to see how and where the customer uses the software; usually there is a need to teach them how to use it. Provision of updates or new versions allows the supplier to visit the customer and learn more. Learning the customer’s use process is extremely important and increases everyday interaction. One of the main findings of this study is an understanding of the cumulative and continuous nature of value through learning.

The customer’s experience of a supplier and its products is a culmination of the customer’s cognitions, emotions and behaviour during the relationship. These elements are interdependent and involve the customer in thinking, feeling and doing as an integral part of their role in value co-creation. Importantly, the relationship experience leads to customer learning. Customer satisfaction and the degree of customer involvement help determine whether the relationship is
ongoing. The supplier’s role is, therefore, one of providing experiential interactions and encounters which customers perceive as helping them utilize their resources. The supplier can support customer learning by developing processes, which take into account the customer’s capability to learn. (Payne et al. 2008). Learning is highlighted in this study, because it is one source of the long-term values.

It is important to note that, according to Anderson & Narus’ definition, a single product can have very different values for different customers; they specifically look at the value in use of a product in a particular usage situation (Anderson & Narus 1999). One of the studied organisations solved this problem in an interesting way. Its product has many features, and different customers use different ones. The product includes several features that are not used in practice. If a customer’s needs grow, providing additional features is easily done. An alternative is to customise or add something to the existing product. Customisation increases costs, so there is some conflict between wanted and possible features. The limited nature of resources (time, money) is an unavoidable reality. Investments depend on how important the customer is, and how easily he would be lost. The important customers have more rights and possibilities to influence, and through that they become more involved. At the same time customers become easily locked-in, because involvement deepens the ties. When the co-operation becomes closer and opens customer’s processes, the supplier’s solutions become integrated. It is very difficult to take off solutions, when they are inside the processes, and even the base where systems work. The customer is forced to continue co-operation as long as it has the same working methods, or systems, in use. This is the reason why it is so important to select the right partner, and after selection it is important to develop the ways of work.

The more a customer is mentally engaged with the supplier, the more the customer can be expected to be inclined to continue doing business and perhaps to increase its business with the supplier (Grönroos & Helle 2010). This is one of the main targets during the use period. When customer’s inside processes and needs come clearer, it offers possibilities to sell more. This creates more value to customers too, because they get better fitting solutions to their problems. The co-operation deepens.

Value co-production involves the participation in the creation of the core offering itself. It can occur through shared inventiveness, co-design, or shared production of related goods, and can occur with customers and any other partners in the value network. (Lusch & Vargo 2006). The value network includes other
stakeholders, which interact and have influences on each other. In this study is concentrated on the relationship between supplier and customer, but there are other actors in the network. The competition seems to be hard, and especially losing customers is a bad sign. The findings tell that each customer is worth fighting, or at least reason to find out what is wrong.

This co-creation concept represents a rather drastic departure from goods-dominant logic, which views value as something that is added to products in the production process and at point of exchange is captured in value-in-exchange (i.e. price). Service-dominant logic, however, argues that value can only be created with and determined by the user in the ‘consumption’ process and through use or what is referred to as value-in-use. (Lusch & Vargo 2006). In this distribution, the software should be situated somewhere in the middle, because it has features from both. Supplier is a developer, but value is realised through use, not in exchange. Interesting question is that if suppliers don’t participate during the use, where they get the value? In the case they don’t have direct connections to users then they use the product, it is difficult to see co-operation or long-term value. One of the basic assumptions is that the value is created in co-operation.

Value-creation theories take note of the importance of the use situation, but do not explain in detail its content. In this study use is a central part of the value-creation process. Customer value is defined as a “customer’s perceived preference for and evaluation of those product attributes, attribute performance and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations” (Woodruff 1997). A finding of the study is that value creation is presented as a process in which value is created in the course of interaction between supplier and customer. A natural cause-effect consequence is that the relationship develops in collaboration. On the one hand, relationships can be defined as chains of interactions in which suppliers and customers exchange attributes. On the other hand, a relationship can be either a precondition or a consequence of the interaction. The relationship is the glue between suppliers and customers, making interactions deeper and more significant. The relationships are long, because they last as long as the software is in use. The rare picture is that the customer in stuck with the supplier, when the situation is not so wanted. The nicer way is to say that the relationship develops in different situations, even conflicts.
Interaction and relationships

Relationships are always present wherever there is an interaction between two or more parties. However, the quality of relationships is emergent, derived from the experience of interacting together over time. It is the quality of the relationship that can be ‘managed’, not the relationship as such, and this is a common misconception. How to manage relationship quality is a consequence of learning together over time. This is an important issue, because relationships that are beneficial to all parties provide structural support that is useful for sustaining further value-creating activities. (Ballantyne & Varey 2006). It depends on the quality of the relationship how strong it is. During the relationship supplier and customer learn to work together and find common goals, but relationships have influences on the personal level. Trust is a basic demand for the relationship. According to this research value is created in a relationship –through interactions over time.

In this study, interactions are seen as tools with a direct bearing on relationship development and behavioural outcomes. Interactions are connections between suppliers and customers, and lead to collaboration. Interactions consist of both material and nonmaterial exchanges. Through interactions, relationships become deeper (assuming everything goes well). There is always the possibility that the relationship will end, and such a situation should be accepted as a learning experience. Learning is an important factor in an organisation’s survival and development. At the same time, another side of the coin, called teaching, have an important role. It has direct influences on the use experience, because the software should be used right to get best value of it.

Relationships are composed of different interactions. The interaction process consists of a multitude of exchanges and adaptations between firms (Holmlund & Törnroos 1997). According to Easton (1992), adaptation processes are related to exchange processes. The more intense the exchange process between firms, the stronger the incentive to make adaptations. It is to be expected that the levels of trust and commitment will affect adaptive behaviour, and that adaptations, in turn, will feed back into increased trust and commitment (Brennan & Turnbull 1999). In the software business, trust is a basis for open communication and for sharing information. In practice, when a customer makes time for a supplier, it is an extremely important sign of trust.

Relationships evolve over time; temporality is therefore a vital component of relationships. It takes some time before a sequence of interactions can be labelled
an effective relationship. Both past and future expectations related to business relationships influence the present state. Continuity in a relationship reflects the strength that comes from using learned and innate skills for mutual benefit. Continuity can also be a competitive tool; the manifestation of a relationship forms a specific asset and creates entry barriers for competitors. (Holmlund & Törnroos 1997). Integrating with an outsider’s system is not a desirable situation, and can cause problems with time schedules. An organisation’s market position and relationships with other organisations influence its working methods. These situational factors can have positive and negative effects.

Håkansson & Snehota (1995) perceive social interaction first and foremost as a process, one that explains and structures the development of organisational relationships and all of their relevant characteristics. Through ongoing interpersonal communication, individuals construct the other process characteristics of relationships – adaptation, cooperation and routinisation. Therefore, social interaction can be seen as the core activity underlying all other facets of business relationships. This interaction is dependent on the actors in the processes and how they act in given situations. The assumption is that these personal relations also involve actors at the organisational level, thereby strengthening the relationships.

Strength refers to an organisation’s resistance to disruption in a relationship. Strength is usually assumed to increase over time as the partners learn to work with each other and create bonds. The strength of business relationships is related to necessary investments, which make it costly to switch partners. The strength is enhanced through commitment among actors. (Holmlund & Törnroos 1997). Together, commitment and trust form a major product of social exchanges. Relationships are social entities whose potential benefits depend heavily on the involvement of the two parties and the degree to which they are prepared to react, adapt, learn and invest. Relationships are in many ways the assets that bind together all of the other assets of a company and convert them into something of economic value. (Ford et al. 2003).

Investments are of particular interest in the long term. How much is the relationship worth? This depends on how much is invested – in terms of time, resources and money – over the course of the relationship. In this study, core competencies are mentioned briefly. For example, Prahalad & Hamel (1990) describe competencies as complex bundles of skills and resources that enable a company to achieve superior performance resulting in superior perceived value in the market. This superior perceived value cannot be accessed or duplicated by
competing companies. The high cost of resources places limits on what can be achieved. Evaluations are based on cost-benefit analyses: How much will a given action increase sales? Either benefits accrue from sales, or someone agrees to pay the extra cost. If the customer is willing to pay to get something extra, then it can be done. A cost-benefit analysis should inform any such decision.

Results of this study show, that the importance of each customer is measured in money, both current profit and future expectations. Measuring value is more complicated. For example, what is the value of information? The supplier gets a lot of information from each customer and especially customer’s inside processes. This kind of information can’t be exploited very widely. The idea of how to use the gathered information is based on how customer value could be got a step further. At the more general level, there is a lot of user information, which is not used very well. Measuring value seems not to be that important, it is more important to understand where the value is and how to use it. Information develops to knowledge and increases expertise in the organisations. For example Ford (1997) noticed that the content of information is the most important aspect of information exchange.

Software business context

In this study, the use period is at the heart of the value-creation process, because the software’s success depends on the use experience. If the customer doesn’t use the software, the game is over. This sounds straightforward, but in practice it is complicated. In this study I use software-development theories to explain the importance of use, on the one hand the possible actions suppliers can take during use, and on the other hand the actions customers (or users) can take. Wilson & Jantrania (1994) argue that value is measured using economic, strategic and behavioural dimensions, but do not examine the interrelationships among the three dimensions. In this study is highlighted especially the behavioural (actions), but economic dimensions have power in made decisions and strategic dimensions are like invisible hand, which handle everything.

Woodruff (1997) develops the concept of customer value hierarchy, a model that links customers’ desired value and satisfaction with received value, and this again emphasises the role of perception. Based on value hierarchy, a customer learns that use of a product has certain consequences. The customer has purposes and goals, i.e., reasons to use the product or service. Further, the use situation plays a critical role in evaluation as well as in desires. In this study, reason to use
and motivation to use are extremely important at the beginning of the process. In the absence of motivation, use cannot begin: Why does the customer need the product? Further, what is the problem the customer wants to solve? In this study is presented that understanding what the customer really wants to do is the basis for all subsequent action.

Sometimes customer really needs a service, but the product offers the step on it. The product has a role as a tool how to use the service, and further, the service is impossible to use without the product. One example could be iTunes, which is tightly connected to Mac-computers. There is no humans between the service and the computer, but still the profit exists. This is one type of productisation, which is a challenge for traditional software business typing. For example Sallinen (2002) found out only five software supplier types, which don’t take into account that type. This study recognises service-oriented product business as a new type, when it is possible to do more profit with the service (only used by certain type of product).

The software business doesn’t generate value unless its software is used, as it is claimed in this study. In fact, if one’s business is to see any return, one is compelled to focus on the people who will eventually use the software. In organisations where we consistently fail our users, we also fail the business paying for the software. When users try to use software that’s inefficient or prone to high error rates, or when they opt out of using the software altogether, any anticipated value evaporates. You would notice this lack of value quantified in the metrics you’d identified. To genuinely focus on users, the first step is to understand how it pays your organisation to do so. Identifying and communicating business goals and metrics comprise the foundation of a good user-centred design approach. (Patton 2008).

From business perspective it is important to get customers stay, in software business this happens through lock-in. Customers have so high switching costs, that changing supplier is not very wanted possibility. For example, Messerschmitt and Szyperski (2000) have noticed that in their research. There is also other ways to lock-in customers, for example mobile operators lock phone numbers for years. They offer you cheaper phone bills, but at the same time they want customers to stay for longer time. One reason is that it is cheaper to keep customers than find new ones. Customers might grow dissatisfied over time, but they are unlikely to leave because alternative solutions are not available, like situation can be in the software business. In long run, this can cause a lot of problems in the relationship.
Creating a successful product requires identifying market needs and translating them into a product vision and scope. The customer’s requirements are the glue that holds together the different phases of the product lifecycle – the sum of all activities needed to define, develop, implement, build, operate, service and phase out a product and its related variants (Ebert 2006). Information from the market and from customers is extremely important, but so is employees’ expertise. Within the organisation lies potential knowledge that should be exploited. The special character of the information offers quite complex situations, when the supplier gets information from the use situations. When the customer uses the software, it increases the information to the supplier. Is it ethical to get value from that kind of information content? In any case, it increases supplier’s knowledge. Is there a possibility to sophisticate customer information to get more value? For example Wikipedia includes a lot of information, which should be used better.

The importance of strategy is particularly evident in the empirical part of this study, serving as a guideline behind (or above) everything else. Strategy is like a mirror in which all decisions are reflected. Empirical analysis shows that the decision-making process is quite complex, and easily reveals the hierarchy involved. At the operational level, product management has a role as product owner. The sales can be make decisions based on the amount of expected sales. Product development is guided by a roadmap. From a value-creation perspective, this offers an answer to my earlier question concerning who and what guides the process. Customers have power through sales, and several customers have influences on the market level. They can change direction of the development. There is also other stakeholders, who have power through investments.

Building useful software relies on understanding users, their goals and their problems, and on determining what kind of software will help them reach those goals and solve those problems. User-centricity isn’t just caring about users or asking them what they want. It’s understanding them and collaborating effectively with them to help them make informed choices about what software to build (Patton 2007). The importance of understanding is highlighted several times in this study. Too often it is assumed what customers may want, and made mistakes are expensive. Sometimes even customers themselves assume, because they don’t really know their future needs. This is a reason why it is so important to be close to customers.

According to Hoch et al. (1999), user involvement is the most important success factor in the software-development process. Customers who are closely
involved better understand the implications of their decisions, and usually make faster and better decisions. Customers can only communicate past experiences, so they need experience of using the software if they are to tell the supplier anything reliable. Findings of this study present that there is a big gap between “want lists” and real needs. Collaboration makes it easier to identify real needs and appropriate solutions, because it allows the supplier to get closer to the customer’s processes and offers an opportunity to get familiar with them in practice. In this way, the supplier can become deeply integrated into the customer’s processes, and through that understand the real needs better.

Satisfaction comprises comfort and acceptability of use. Comfort refers to overall physiological and emotional response to use of the system (i.e., whether the user feels good, warm and pleased, or tense and uncomfortable). Acceptability of use can measure overall attitude toward the system, or perceptions of specific aspects, such as whether the user feels that the system supports the way they carry out their tasks, whether they feel in command of the system, and whether the system is helpful and easy to learn. If satisfaction is low while efficiency is high, it is likely that the user’s goals do not match those selected as a gauge by which to measure efficiency. (Bevan & Azuma 1997).

The concepts of customer value and customer satisfaction are closely related. Both describe evaluation of and judgments about products in use situations. In fact, perceived value may lead directly to the formation of overall feelings of satisfaction (Churchill & Surprenant 1982). It is true, that the focus broadens from evaluating basic attributes of the relationship as a whole to include an evaluation of cumulative experiences. Based on findings of this study, this can cause big surprises. The customer uses a simple cost-benefit analysis to find out how satisfying the situation really is. So, problems can arise even when the situation seems to be going smoothly. Such a “surprising” turn of events stems from earlier experiences and earlier disappointments. On the other hand, customers generally evaluate the whole picture, rather than noticing every little problem independently. Customers are more interested in how suppliers react to their problems, and in the extent to which the problems are solved. If a customer feels they are being treated well, the problems themselves can be more easily tolerated.

Eggert & Ulaga (2002) have shown that most satisfaction models are rooted in the disconfirmation paradigm. Hence, satisfaction must be considered as a post-purchase construct. Customer-perceived value, in turn, is independent of the timing of the use of a market offering (Woodruff & Gardial 1996) and can be considered as a pre- or post-purchase construct. The constructs are aimed in
different directions. Customer satisfaction measures how well a supplier is doing with his or her present market offering, as perceived by existing customers. Such a tactical orientation provides guidelines of action for improving current products and services. The customer-value construct, in turn, points at future directions. Its strategic orientation aims to assess how value can be created for customers and by what means a supplier’s market offering can best meet customers’ requirements (Eggert & Ulaga 2002). As a consequence, the assessment of customer-perceived value is directed toward former, present and potential clients, whereas satisfaction research is mainly geared toward the supplier’s current customer base (Eggert & Ulaga 2002).

Satisfaction research is predominantly oriented toward assessment of the supplier’s market offering, but does not necessarily integrate information pertaining to competitors’ product offerings. Customer-perceived value measurement, on the other hand, explicitly benchmarks the supplier’s offering with competitors (Eggert & Ulaga 2002). Woodruff (1997) argues that marketing information systems should integrate not only satisfaction indicators, but also customer-value measurements. Managers should take into account both variables when designing marketing information systems. Critical customer information includes on the one hand data about how satisfied customers are with the company’s products and services. On the other hand, the assessment of how value is perceived by customers in market offerings complements the information needed for marketing decision making. Satisfaction is strongly linked to behavioural outcomes.

Quality in use is the user’s view of the quality of system-containing software, and is measured in terms of the results of using the software, rather than properties of the software itself. Quality in use is the combined effect of the software’s quality characteristics for the end-user. It can be measured as the extent to which specified users achieve their goals with effectiveness, task efficiency and satisfaction. Effectiveness can be measured by the accuracy and completeness with which users achieve specified goals; task efficiency by the resources expended in relation to task effectiveness; and satisfaction by attitudes to the use of the product (Bevan & Azuma 1997). According to interviewees, quality is too wide and abstract a concept to be useful as a measure of value. It is more important as a tool in the product-development process (in the sense of “Well, this isn’t working as well as I expected”). The quality-price combination is a better fit with traditional product businesses than with software.
Customer value is a dynamic concept, so we should not expect value drivers to remain the same over time (Parasuraman 1997). In other words, the drivers that motivate a customer’s initial purchase of a service and/or product may differ from the criteria that connote value during use right after purchase, which in turn may differ from the determinants of value during long-term use (Parasuraman 1997). Usability can refer to a set of independent quality attributes (user performance, satisfaction, learnability) or to all three at once (Bevan & Azuma 1997). Results clearly show that the value of IT systems depends not only on computer and telecommunications hardware and software, but also on the employees – their responsiveness, flexibility, reliability and competence – as well as on the relationship between the customer and the supplier and on what is given up by the customer organisation itself (Lapierre 2000). Problems with usability are easier to stand, if the product is new and it is still developed. It is interesting that sometimes customers are familiar with the bad usability and resist the changes. They have learned how to use something, and don’t want to learn it again. So, it seems to be that learning has also negative influences.

7.3 Managerial implications

From a managerial point of view, the software business is still a rather new and developing business area. Traditional “rules” on how to make things don’t work in the software business, and new “rules” have yet to be completely drawn up. Suppliers search for the right way to communicate with customers. There is strong pressure to listen to customers and do the development work based on their needs. At the same time, it has been noted that customers aren’t entirely sure of their needs and are very unsure about how to solve their problems. Support is needed to an even larger degree than expected. This study makes clear that interaction and collaboration are badly needed in the software business. In the next section, suggestions are presented in the form of managerial implications. The Figure 12 shows the actual sources of the suggestions.
Firstly, **listening is not enough**, even if measuring customer satisfaction has traditionally been the main avenue for listening to customers. Customer satisfaction measurement needs to shift toward understanding more fully what customers value in terms of which products and services help them to achieve their organisational goals and purposes. Woodruff builds the key elements in this definition into a customer-value hierarchy model linking desired product or service attributes and performances to desired consequences in use situations. These ultimately link to the customer’s goals and purposes. The first step is to get customers interested; the more you can promise, the greater your advantage over the competition. In practice, promising too much causes problems later, so it is important to be careful.

“**Suggestion 1:** The first step is to offer pre-solutions to attract the customer. The second step is to offer more specified solutions, which really helps the
customer to solve the problem. Pre-solutions help customers in uncertain situations and give them more time to identify both their real needs and a real solution.”

It is argued that the customer-value hierarchy allows a determination of customer-perceived value by providing a richer and more meaningful understanding of customers’ needs and desires. In the end, the goal is customer satisfaction. One main description of customer-perceived value is connected to this value hierarchy model. This description is an important part of this study, too. In the end, it is always the use situation that is the most significant component of customer satisfaction; in particular, how well expectations match real experiences. Suppliers should develop processes to learn how and why customers use software. Through collaboration, suppliers get close to customers’ processes, enabling them to support correct use and offer alternatives. This closeness is a key to developing understanding between supplier and customer.

“Suggestion 2: To support correct use, it is necessary to understand both the customer’s reason for using and use purpose. Learn not only from customers, but also about customers. Further, the deeper your involvement in the customer’s processes, the easier it is to understand them and correct mistakes in collaboration with them.”

With all possible definitions, it is very difficult to specify precise measurable usability attributes and their interpretations from different perspectives. As an example, for the user, software usability is essential because it measures user performance and satisfaction. An application that features good usability will allow the user to perform the expected tasks more efficiently. For managers, usability is a major decision factor, particularly in selecting a product. Therefore, it has a direct influence on organisational productivity and performance. For software developers, usability can be described in terms of the internal attributes of a system that affect user performance and productivity. For example, learnability can be defined as a simple sub-attribute of time of learning, or as an independent quality factor that might potentially be shared with several attributes.

“Suggestion 3: Customers make evaluations by comparing expectations with experiences. Keep promises and react quickly to problems. Sometimes problems influence the development process. Usability, for example, has a direct influence on use.”
Through cumulative knowledge it is possible to make the necessary decisions on both operational and strategic levels. This cumulative knowledge is one of the most important issues to understand from the value perspective. Closely related to knowledge is learning, which includes common experiences. Knowledge is collected from customers and from the market, but also from one’s own employees inside the organization. Knowledge should be used effectively not only with individual customers, but also in other situations.

“Suggestion 4: At the end of the process social bonds may be tight, but if plans and expectations diverge, this relationship is of little help. Take note of different sources of knowledge and use that knowledge in different places and at different times. It is especially important to understand how this knowledge affects the course of future events. Make plans for the future and pay attention to your customers, but don’t depend solely on them.”

As a summary, a few important question need to be answered. Who is the customer? Different customers have different needs, so an understanding of one customer’s needs can’t necessarily be applied directly to those of another customer. Both experience and knowledge are useful. What does the customer want? This sounds like a simple question, but in practice it is very difficult to answer. Often, customers themselves are unable to answer this question. How to determine the appropriate amount of customisation is a related question. How much should be invested? Use of resources increases price, as shown in the example of the high cost of working hours. Finally, how important is the customer? When importance is placed on the customer, problems are taken more seriously. This is also an economic question, because expected benefits should exceed the costs.

**Insights for the future**

This study focuses on a conservative approach to doing business based on widely accepted guidelines. The research process generated a few ideas on how these baselines are changing. This brief chapter is based on these ideas and how they could change the world. For software suppliers, it is important to understand that in the future, things will not be done the way they are today. Forecasting the future is difficult, but a few trends are already evident.

First, the user’s role seems to be changing even more radically than expected. Users are not only using products and services, they are also creating the content
in various business areas. Readers don’t write stories to Kaleva (newspaper), yet. They are active in writing blogs and even applications for free use. When a new development occurs, those involved can inform others easily and effectively via the Internet. News no longer requires official channels to meet a wide audience.

Second is the concept of negative price. In the software business, it has been assumed that the price can be close to zero, but it now seems possible that it can be negative. To attract customers, suppliers can offer something for free. Experiences of use and collected information are valuable to suppliers and other stakeholders. When a supplier pays customers to use a product or service, the price is negative. This sounds difficult to accept when we think about the worth of something in terms of an amount of money. In business, products and services are traditionally exchanged for money, but now, the value of information is interfering in that process.

Third, what lies at the root of success? Nokia had a large range of phone models and a strong market position, but still hit a wall when Apple entered the same market. Apple has one model, but it attracts huge numbers of customers. Is success based on innovation, and users who are always searching for something new? This could mean in practice that success can’t last, because users will quickly move on to something else. At the same time, other customer groups notice that it is considered cutting edge to use an iPhone. So, the image becomes an important reason to buy. Nokia had a strong market position, but who wants to buy a phone based on that?

Fourth, the success of text messaging is easy to understand in hindsight, but who predicted that this application for writing and sending short messages would be huge? Why something breaks through is an interesting question. Why do we want to send text messages? Because it’s an easy and quick way to communicate when we are too busy to call.

Fifth, the fact that users are important and must be taken into account is, at least, a widely accepted slogan. In this study, users comprise the group that actually uses a product or service and obtain use experience. The value of users is more difficult to define, because they don’t pay the bills. If they don’t use the product or service, the consequence is clear – it will drop out of the market. Value must be defined according to long-term benefits such as knowledge and learning. Knowing the use process – being close to it – is extremely important for the supplier.

Finally, how stable is value? I have explained that positive use experiences are a basis for satisfaction, and a satisfied customer wants to stay. In practice, this
means that suppliers must do whatever it takes to support the use situation. It sounds like a win-win situation, but why do collaborations end? Both parties have worked hard to increase value and, more practically, to reach a common understanding. The situation may seem stable for the moment, but cumulative experiences and future plans influence decisions.
8 Conclusions

This chapter concludes this study, which had the purpose of describing value creation in the context of the software business. First, the theoretical contributions of the study are summarised. Next, the answers to the research questions, which are given in detail in the theoretical part of the research, are provided here in summary. Following that, a few limitations of the study are addressed, following by some suggestions for future research.

8.1 Theoretical contributions of the study

The study contributes to widely researched value creation literature. Traditional economics focuses squarely on the exchange of products and services between the company and the consumer, placing value extraction by the firm and the consumer at the heart of the interaction. In the co-creation view, all points of interaction are opportunities for both value creation and extraction (Prahalad & Ramaswamy 2004a). Much current theory focuses on attributes related to product and service offerings, and customer value is inherent in or linked through the use of some products (Woodruff 1997). In this study the use period is pointed out to be more important than exchange.

According to Eggert & Ulaga (2002), customer-perceived value is a complement to, not a substitute for, customer satisfaction. However, more research is required before a particular view concerning the homological relationship between customer-perceived value, customer satisfaction and behavioural outcomes is to be accepted. Theoretically the behavioural outcomes cause both positive and negative effects on value creation. They can even cause conflicts, when the customer feels that he is not treated well enough. The target is to find out the way, how customers are willing to stay and continue co-operation. In software business context lock-in relationships are profitable, but can cause problems especially for trust between suppliers and customers.

For example, Prahalad & Ramaswamy (2004a) link interaction and value co-creation. High-quality interactions that enable an individual customer to co-create unique experiences with the company are the key to unlocking new sources of competitive advantage. The meaning of value and the process of value creation are rapidly shifting from a product- and firm-centric view to personalised consumer experiences. Informed, networked, empowered and active consumers are increasingly co-creating value with firms. The interaction between the firm
and the consumer is becoming the locus of value creation and value extraction. As value shifts to experiences, the market is becoming a forum for conversation and interaction. Bendapudi and Leone (2003) have reviewed co-production and co-operation literature widely.

Studies dealing with value creation in collaboration have a significant role in recent research. The perspective is quite often service business, lately service-dominant logic on value creation. Vargo et al. (2008) presented the differences between product- and service-dominant logic. In service-dominant logic on value creation firms propose value through market offerings, customers continue value-creation process through use. When in good-dominant logic firms embed value in goods or services, or value is added by enhancing or increasing attributes. This kind of distribution is not suited in the case of software products and service, instead they should be situated somewhere in the middle.

Studies concerning the use period are not new in the software business context, and they support well the same targets than the value creation. According to Hoch et al. (1999) user involvement is the most important success factor in a software development process. According to ISO 9241 usability is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use. User centricity isn’t just about caring about users or asking them what they want. It is about understanding them and collaborating effectively with them to help them make informed choices about what software to build. (Patton 2007). Further, the perception of value is formed through all the experiences a customer has throughout a product’s lifecycle (Goodwin and Ball 1999). This kind of use-centricity deepens the value aspect and increases temporal view. Value changes and is developed, it can be influenced during the process. Positive experiences depend on supplier’s reactions, even more than continuing positive ones.

Karat (1997), for example, defines a user-centred design as an iterative process whose goal is the development of usable systems through the involvement of potential users in the systems’ design. The lifecycle of a software product is normally defined (IEEE standard 100-1988) as starting when the product is conceived and as ending when the product is no longer available for use. The usability engineering lifecycle extends beyond this period because of the impact of usability decisions on future products and their lifecycles. The product life cycle includes a lot of work, which is not noticed in value creation. They are supporting the value creation process.
In fact, the main theoretical contribution of this study is to connect value creation to software context, even to its lock-in aspect on relationships. As a help is used different kind of process models both from value creation and software development, lifecycles and usability. Most important process is the interaction between supplier and customer, which is used to describe exchanges in different phases. Ford (1997) uses product/service exchange, financial exchange and social exchange, which fit well to a priori model. Interaction increases the relationship development and through that positive effects on the value creation. Relationships are theoretically supported from both value creation and software viewpoints.

The framework combines supplier’s and customer’s perspectives though interaction. Theoretically model consists of four phases, called development, purchase, use and evaluation. It increases details to discussion on temporal view of value creation. According to Lapierre (2000) value offering consists of product-, service- and relationship –related benefits and sacrifices or different combinations of these. Spiteri and Dion (2004) collect the consequences of customer value based on a literature review. The literature identifies two types of satisfaction: transactional and overall satisfaction (or cumulative satisfaction). Based on the empirical findings of this study, the importance of understanding both the short- and long-term effects on value creation should be highlighted. The value is cumulative on its basic nature.

The biggest surprise during this empirical section was that the case organisations had already thought the value. They had concrete ideas what is their value for customers, even if the ideas were quite solution dependent. They knew that through their solutions customers get some value, especially because customers don’t have to do the development work by themselves. Keeping the made promises means the same than implementing the value offerings, in all but name. I had four case organisations and gathered material offered very rich view to the software world in practice and supplemented my theoretical framework.

8.2 Answering research questions

The research problem of this study was: How is value created in the context of the software business? This study was undertaken from the collaboration perspective, meaning that both actors (in this case, suppliers and consumers) were consulted and active in the development of a common understanding. The process included four phases: development, purchase, use, and evaluation. Interactions are described as exchanges between supplier and customer, and can be either material
or immaterial. *Short-term interaction* (that is, communication in everyday activities) takes place during each phase. While short-term interactions are occurring between suppliers and customers, a long-term communication develops that consists of factors such as experience, learning, and knowledge. During the continuing collaboration, social factors become meaningful, as the focus of evaluation changes from short-term to long-term. For example, knowledge gleaned from one long-term relationship can be put to use in developing other supplier-consumer relationships.

The first question was: *What is the concept and content of customer-perceived value?* Value has been approached from many different perspectives. Most of these perspectives are derived from the field of economics. These include exchange, utility, and labour value theories as well as marketing, accounting, and finance. Furthermore, the considerable strategy and organisational behaviour literature on competitive advantage is closely linked to value concepts. This question is discussed in more detail in subchapter 2.3 concerning the concept of customer-perceived value. In this study, customer-perceived value is based on the whole value-creation process and experiences that take place during it; customer connection to the situations of use is close and deep, and customer-perceived value is based on expectations compared to experiences. At the most basic level, cost-benefit analysis is behind the evaluation, but it is often difficult to conduct such an analysis. I have used customer-perceived value as the starting point of this study, because satisfying the customer’s needs is a clear need for both businesses, and a focus of the value-creation process. It is not the only focus of the value-creation process, however; the supplier’s perceived value is equally important and is also based on a cost-benefit evaluation (and an overall evaluation of customer needs and desires). Woodruff (1997) defines *customer value* as a customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achievement of the customer’s goals and purposes in use situations. This definition already mentions that the use has consequences and that the customer buys products and services for some purpose related to their use.

The second question was: *Which factors influence the creation of value perceived by customers?* The value is created by products and services that help customers achieve their goals in various use situations. In practice, the supplier’s actions play a large part in how satisfied the customer is. Customers buy products and services to satisfy needs in situations of use. Over the short-term, it is a trade-off between desirable attributes compared to sacrifices; the technical aspect of the
product or service is especially important at the beginning of the process. Over a longer period of time, the supplier has several possibilities for influencing perceived value on the part of a customer. First, the supplier can listen and ask the right questions in order to discover the customer’s needs. The supplier could preemptively offer a solution to help customers during their selection process, and specify which products meet their expressed needs. Supporting the customer and reacting quickly to problems during the use period is essential. The supplier can also demonstrate value-offering behaviours to influence customers. These behaviours can consist of product-based, service-based, and relationship-based benefits and sacrifices. For example, suppliers can increase value by increasing benefits and decreasing costs, if possible. Suppliers can influence both customer’s pre-use expectations and experiences before and after use. The supplier must be careful in promises, because expectations that are too high can cause disappointment. Rather, the customer’s experiences must be equal to or higher than created expectations. Collaboration between suppliers and customers increases common understanding and the chance of finding the right goals. Through this, the supplier learns about their customers’ positive and negative experiences and can use this knowledge in other situations. The amount of investments (on the part of both the customer and the supplier) determines the importance of the relationship. The investments can be monetary or nonmonetary. During the collaboration actors learn to work together, and all connections, shared documents, and open communications increase closeness in the relationship.

The third question was: **How is the significance of exchanges seen in value creation?** The central tenet of the business relationship is the exchange process, in which value is given and received; it does not necessarily mean the traditional purpose. Even in the most tenuous and short-lived relationship, each side of the dyad gives something in return for a benefit or pay-off of greater value. The characteristics of collaborative exchanges are close communication, social and process linkages, and mutual commitments made in expectation of benefits in the long-term. The supplier pursues the objective of collaborative exchange by developing a deep understanding of customer needs and requirements, then customising solutions to these needs as closely as possible, and giving continuing incentives for the customer to concentrate their purchases with them. Exchanges become deeper and more significant during this process. The full elucidation of this concept appears in chapter 2.4.

The core features of the supplier-consumer relationship (mutuality, long-term character, context dependence, and process nature) are described in more detail in
chapter 2.4.2. This relationship is a natural consequence of long-term interaction, and factors like trust, involvement, and open communications are based on it. Exchanges develop to be social, meaning that in each exchange the focus is different. Social exchanges are at the personal level, and can even be friendships; relationship value includes economic dimensions, strategic, and behavioural dimensions (Wilson & Jantrania 1994). Relationships are valuable in and of themselves, but as they evolve learning, knowledge, and communication increase their value.

The fourth question was: What is the use value and how is it made visible? At this juncture, building on the notion of value in use is based on the understanding of value in different use situations. Interestingly, customer value is dependent on the use situation, yet many definitions of value do not pay heed to this situation. The use situation is the context of interactions between suppliers and customers. Furthermore, it is suggested that the linkage between customer values as a set of deeply-held beliefs and the value that customers obtain from a business relationship with a supplier, or from a particular instance of use, is that the set of values that a customer has may condition their experience of the use event. An understanding of customer values may therefore be important in determining the context and outcome of the customer event. The use value is created during the value-creation process. It is important to notice the use value even in the development process; the use value includes both the usability aspect and the quality aspect. Chapter 3.2.3 focuses on users and usability. I have explained use as the core of the value-creation process, as it is the focus for all action. At first, the most important aspect of a product or service for a supplier is that it is sold, as its sale is the basis for all future action. After sale, it is important for the product to stay in use. In this situation, the target is not the faceless ‘mass market’. The use value is created during the whole use period, and through the use value the offering becomes concrete. From the vantage of the supplier, understanding the customer’s reason to use, purpose of use, and way to use for a particular product or service are extremely important for increasing value. At a practical level, the knowledge collected from customers’ use experiences provides a base for development decisions.

Fifth question: What is the best way to exploit the value creation collaboration in the software business? Creating a successful product requires identification of market needs and translation into a product vision and scope that are executed following sound project management principles. Product management can be defined as the governance of a product’s inception,
development, and delivery to generate the greatest possible value for a business. Requirements for the development of a successful product are the basic building blocks that bring together the basic phases of a product life cycle. Knowing customers is the basis for several decisions, but more questions need to be answered. For example, different customers have different needs; however, in a deeper sense, the business also must know their customers’ types. For example, innovators will accept an unfinished product if they get the product early enough. Second, what are the customer’s wants and needs? Understanding the real needs of each customer makes it possible to offer the right solutions. Third, how much investment is needed? If the solution must be customised, or the customer has special needs, more resources are required. Time, money, and working hours are all considerable expenses, and investments should be profitable. Fourth, the business must evaluate how important the customer is; businesses must do anything in their power to not lose important customers. Close collaboration between businesses (suppliers) and customers make it possible for the supplier to be deeply involved in the customer’s processes and understand them more completely.

With the software business, the business doesn’t receive value unless the software is used. The group using the software will eventually express opinions about it; businesses must focus on this group to get optimal return. In organisations where software consistently failed with users, the organisations also failed the business as a whole.

The first step for focusing on users is to understand how much it costs your organisation, if you do so (Patton 2008). Delineating the correct business goals and right development directions are an important foundation for the business. Building useful software relies on understanding users, their goals, and their problems, and on determining the software that will help them solve their problems and attain their goals. User-centric practices in business do not simply consist of caring about users, or asking the users what they want. It is about understanding users and collaborating effectively with them so that the software supplier can make informed choices about what software to build. The best way to accomplish this for a business is to build a collaborative relationship with the customer and react to problems early on. The supplier’s evaluation phase (for software as well as other products and services) includes evaluation of the current and future situation, providing the opportunity to make changes if needed.
8.3 Limitations and avenues for future research

The fact that this research was conducted in the context of the software business is both an asset and a drawback. This study is rich in the sense that the software business is challenging and competitive—an interesting research area that should be studied more widely and with new perspectives. The drawback is that, when something works in one business area, it is not so easy to extrapolate what works (whether it is a product, or a process) to another area, because each area of business is so specialised. This study focused on enterprise solution systems, which comprise only a minor part of the whole software business. This assisted with the study by narrowing the focus; perhaps a future study could increase the scope of focus effectively.

It would be interesting to change the context and determine the degree to which the environment really influences the value creation process. My solution was to combine the product and service in developing my questions and topic, rather than concentrate on one or the other. It might be possible to change this context and focus on, for example, the software service business.

The qualitative research method was close to a ‘narrative’ method. I was interested in process: how things happen, and why. It could be interesting to undertake a quantitative study, in which the number of organisations studied could be much greater. It could offer more possibilities for finding guidelines and cause-and-effect factors. Through this, the findings could be generalised.

One very strong limitation is that this study concentrated only on the supplier side of the process. A corollary need exists to focus on the customer side, as interactions are two-sided communications. Furthermore, this study uses the terms supplier and customer, because the focus is in interaction between them. It must be noted that the supplier has several customers, with different kinds of relationships, and vice versa. These relationships form networks, in which the organisations have their own positions. Accordingly, the dyadic relationship is only a little part of a wider network, in which all actors influence each other.
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### Appendix 1 List of the interviews

<table>
<thead>
<tr>
<th>Code/ Interviewee’s position</th>
<th>Date</th>
<th>Duration</th>
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<tr>
<td>A1 Management</td>
<td>28.9.2007</td>
<td>61.38</td>
</tr>
<tr>
<td>A2 Sales</td>
<td>24.10.2007</td>
<td>61.20</td>
</tr>
<tr>
<td>A3 Development</td>
<td>25.10.2007</td>
<td>50.36</td>
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<tr>
<td>A4 Development</td>
<td>30.10.2007</td>
<td>52.44</td>
</tr>
<tr>
<td>B1 Management</td>
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<td>75.02</td>
</tr>
<tr>
<td>C1 Management</td>
<td>20.10.2009</td>
<td>48.31</td>
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<tr>
<td>C2 Development (client)</td>
<td>23.10.2009</td>
<td>55.49</td>
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<tr>
<td>D1 Sales</td>
<td>28.10.2009</td>
<td>60.20</td>
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<tr>
<td>C3 Development (back-end)</td>
<td>5.11.2009</td>
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<td>6.11.2009</td>
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<tr>
<td>B3 Sales</td>
<td>6.11.2009</td>
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</tr>
<tr>
<td>A5 Business Development</td>
<td>9.12.2009</td>
<td>58.31</td>
</tr>
<tr>
<td>D2 Management</td>
<td>2.12.2009</td>
<td>62.22</td>
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<td>D3 Development</td>
<td>8.12.2009</td>
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<td>A6 Management</td>
<td>17.12.2009</td>
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<td>21.12.2009</td>
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<td>A8 Development/Support</td>
<td>20.1.2010</td>
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<td>A9 Development</td>
<td>25.1.2010</td>
<td>80.09</td>
</tr>
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</table>
Appendix 2 General themes of interviews

- Own role and task in the organisation
- Customers’ needs, information sharing
- Customer-centricity, customer’s wishes vs possibilities to do
- Planning and usability, co-operation
- Structuring solution
- Use period
- Satisfaction measurement and reactions to it
- Relationships
- Markets, marketing, competitors, future expectations
Appendix 3 Codes used in the analysis

- Customer needs
  - What we have
  - What we should know
  - How much influence
  - Places
- Customer info
- Development
  - Process
  - Usability
  - Decisions
  - Customer influence
- Solutions
  - Features
  - Wishes
  - Roadmaps
  - Platforms
  - Timing
- Use
  - Customers/users
  - Get to use
  - Training
  - In use
  - Support
  - Updates
  - Feedback
  - After use
- Satisfaction
  - Measuring
  - Use
- Relationships
- Future
577. Alahuhta, Janne (2011) Patterns of aquatic macrophytes in the boreal region: implications for spatial scale issues and ecological assessment

578. Moody, Gregory (2011) A multi-theoretical perspective on IS security behaviors

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588. Tervo, Heli (2011) Information technology incidents in the present information society: Viewpoints of service providers, users, and the mass media

589. Riipinen, Katja-Anneli (2011) Genetic variation and evolution among industrially important Lactobacillus bacteriophages

590. Lampila, Petri (2011) Populations and communities in human modified forest landscapes

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