INFORMATION FLOWS IN CUSTOMER-ORIENTED SERVICE DEVELOPMENT PROCESS

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ABSTRACT

The aim of this thesis is to demonstrate the importance of information sharing and communication in the service development process in order to ensure that the customer expectations are commonly understood.

The study examines how the stakeholders are behaving in a service development process environment and how the process is supporting flows of information across functions within the case company.

The aim is to gain an understanding of the current state of the information flows in the service development process in the case company and to identify improvement areas and methods to remove the information flow barriers between the stakeholders.

In order to support the empirical part of the thesis the theoretical framework discusses two main concepts: customer-oriented service development and organizational information management, which are closely related.

This thesis has characteristics of a case study as it investigates a service development process and its information flows in a case company. The emphasis is to gain understanding of the object through meaningful data gathering from different sources and in the case study the data collecting methods are observation, written material analysis and unstructured interview.

This study provides an insight on the service development process from the perspective of information flow by demonstrating the state of the information sharing and communication between the stakeholders.

Keywords: service development process, process development, information flow, information sharing and communication.

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JALONEN, MARIKA: Tietovirrat asiakaslähtöisessä palvelun kehitysprosessissa

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TIIVISTELMÄ

Tämän opinnäytetyön tarkoituksena on havainnollistaa miten tärkeää ja tarpeellista on jakaa ja kommunikoida tietoa, että voidaan varmistaa asiakkaan odotusten yhteinen ymmärtäminen.

Tutkimus tarkastelee sidosryhmiä sekä heidän käyttäytymistään palvelujen kehittämisen prosessiympäristössä. Samalla tutkimus pyrkii selvittämään miten palvelun kehitysprosessi tukee tiedon virtaamista eri toimintaympäristöjen välillä kohdeyrityksessä.

Työn tavoitteena on saada kokonaisvaltainen kuva ja ymmärrys kohdeyrityksen palvelunkehitysprosessin tietovirtojen nykytilasta, sekä tunnistaa sieltä kehittämisalueita ja -tapoja, joilla voitaisiin vähentää mahdollisia esteitä toimintaympäristöjen välisessä tiedon jaossa ja kommunikaatiossa.

Tämän opinnäytetyön teoreettinen viitekehys keskittyy tutkimaan kahta kokonaisuutta: asiakaslähtöistä palvelun kehitystä sekä organisatorista tiedon hallintaa, jotka tukevat toisiaan ja luovat hyvän pohjan empiirisen tutkimuksen toteuttamiselle.

Tutkimuksen empiriaosuus koostuu palvelun kehitysprosessin ja sen tietovirtojen nykytilan hahmottamisesta tapaustutkimuksen keinoin. Varmistaakseen tiedon tarkoituksenmukaisuuden aineistoa kerätään eri menetelmillä ja tässä tapaustutkimuksessa käytössä olevat menetelmät ovat havainnointi, aineistoanalyysi ja strukturoimaton haastattelu.

Tutkimus kiteyttää palvelun kehitysprosessin vaikutuksen tietovirtoihin havainnollistamalla miten tällä hetkellä sidosryhmät prosessissa jakavat tietoa ja kommunikoivat keskenään.

Avainsanat: palvelun kehitysprosessi, prosessikehitys, tietovirta, tiedon jakaminen ja kommunikointi.

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1 INTRODUCTION

The aim of this chapter is to provide an introduction to the research presented in this thesis. The beginning of the chapter focuses on providing brief overview to the research area and to the background of the thesis. Further, the chapter will discuss about research objectives, scope and research questions which determine the direction of the research. Finally the chapter will describe the theoretical framework as well as research strategy and methods, and thesis structure.

1.1 Background

Companies today are facing multiple challenges in demanding market environment. There is a high pressure to find new and innovative products and services in order to adapt to the ever-changing customer needs. Those companies who understand clearly the customer needs and are able to translate them into products and services are most likely the ones to succeed (Ward 1998, 7).

In a turbulent business environment the economical success of a company depends on its ability to identify and respond directly to the customer needs. Demanding markets are driving companies to translate the customer needs into products and services better and faster. Especially for the companies providing services it is crucial to understand the customer needs and requirements, and effectively deliver a service that creates memorable customer experiences. (Fitzsimmons & Fitzsimmons 2000, xi, 34)

To survive in rapidly changing and highly competitive environment the ongoing service development is essential. Company's ability to quickly respond to the customer needs is challenging as the service development activities involve several functions and requires integration efforts across the company (Fitzsimmons & Fitzsimmons 200, 90). Developing products or services is an information-intensive process where various activities produce and process the development

information. The outcome of the process is complete when all required information is created and communicated to support e.g. production and sales (Ulrich & Eppinger 2008, 13). This approach is essential for service development since a service is an intangible, non-physical entity and it can be challenging to share the common understanding of the service between different stakeholders in a service development process (Tatikonda & Zeitmahl 2002, 201).

The grounds for this research are in ensuring the delivery of a customer experience by meeting the customer needs and expectations. The idea of the research has evolved along the time and different circumstances have shaped the approach towards the subject. Nevertheless the focus has always been in a customer and an information, and linking these two together in a way that creates win-win solution for the customer but also for the company.

In order to ensure that the customer needs and requirements are understood by all stakeholders involved in the service development process, the information aspect in the process needs to be studied more profoundly. During the service development process the critical service information is expected to be created and communicated, but the level of information and how it is transferred to the stakeholders is currently unknown. According to Ward (1998, 36-37), the nature of ICT industry forces the companies to make efforts to manage information effectively. She suggests that actually entire ICT industry exists in two levels - infrastructure and infostructure level. Infrastructure corresponds to all physical aspects of delivering the service, like network and its operational functions. Infostructure is about information, everything that is needed to carry information in a level of where a customer will receive the service. Infostructure can be used as a tool to determine internal capabilities like; are all needed resources available for delivering the product and what is the skill set to offer this product. In order to transform customer's needs and requirements into a service, the information of the service needs to be communicated and understood by all stakeholders participating to the development process.

Altogether this thesis is literally a story of an iterative knowledge collecting journey, where service provider's employees' ability to manage information within the service development process is under magnifying glass.

1.2 Objectives, research question and scope

The aim of this thesis is to demonstrate the importance of information sharing and communication in the service development process in order to ensure that the customer expectations are commonly understood. Therefore the main objective of the research is to discover the means to improve the information flows within the service development process in order to enhance the information sharing and communication between the stakeholders. The target is to gain understanding of the current state of the information flows in the service development process and further to identify improvement areas and tools to remove the information flow barriers between the stakeholders. The research findings will therefore also provide improvement tools to the service development process to become more information-oriented.

The main research questions are:

- What is the current state of information sharing and communication between the stakeholders in the service development process?
- How to improve the information flows in service development process?

The following sub-questions are defined to support the main research questions and to help to identify the improvement areas.

- Who are the process stakeholders and what are the information requirements?
- Does the process support information sharing between actors of the process?
- What are the barriers in information sharing between stakeholders?

The scope of this research is to focus on improving information sharing and communication between the stakeholders in service development process in order to ensure that customer expectations are commonly understood. The approach of

this thesis is customer-oriented and the overall goal is to ensure that during the service development all stakeholders share the common understanding of customer needs and requirements, and are able to translate them into a service. The thesis discusses the importance of an organizational understanding and practices of information sharing as a key element to remain competitive. The emphasis is on managing information and therefore the knowledge is only discussed to define the information terminology. In addition the discussion involves the role of a process in developing services.

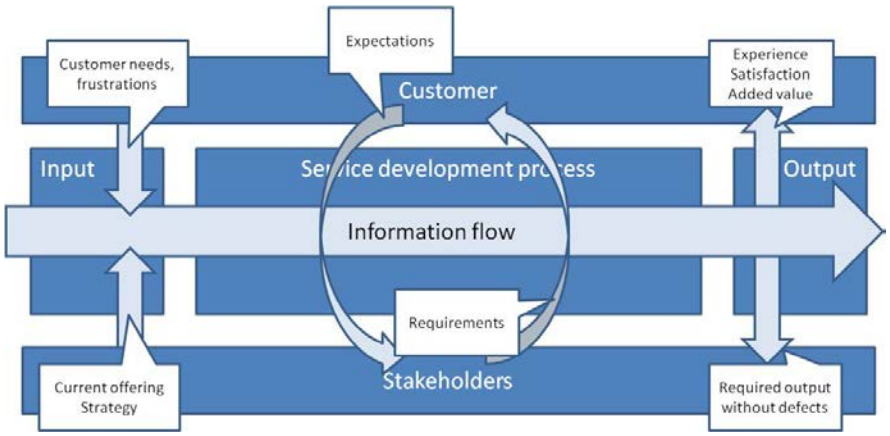

FIGURE 1. The scope of the research.

The scope of the research is illustrated in the figure 1.

1.3 Theoretical framework

There are two main concepts that are theoretically reviewed in this thesis, which at the end have an interrelationship with each other. These two concepts are customer-oriented service development and managing organizational information. Next the main theories are shortly presented and in chapter 2 the theoretical framework is more profoundly reviewed.

The first part discusses about the customer-oriented service development. The chapter is divided into four sub-chapters. In the beginning of the chapter the concept of service is explained to ensure that the uniqueness of service nature is understood. Then the service development success and failure factors are reviewed, which is actually rather convenient for the thesis. The success factors lead to discussion about the processes of product and service development. As the literature about the service development process is fairly inconsistent different models of product and service development processes are introduced in order to gain wider understanding of development process in overall. Also the fundamental role of participants of service development process is addressed and two important roles relating to the research are discussed.

The second part discusses about managing organizational information. The chapter is divided into three sub-chapters. Similar to previous chapter the information and its several definitions are shortly reviewed. The concept of information can be challenging to comprehend as an important asset to the company and therefore the information management is reviewed. Then information management enlightens the path towards to more profound discussion about organizational information sharing and communication. Two different service related perspectives for sharing and communicating the organizational information are introduced.

1.4 Research strategy and methods

Choosing the right research method requires comprehension of the research purpose and the primary audience, as well as understanding of what type of data will answer the inquiry. Researcher's role in a research is to be an effectuating instrument. (Patton 2002, 13-14) The purpose of this research is to investigate a service development process where every step and role is responsible for providing, sharing and communicating critical information to everyone involved in service development. The research tries to identify the barriers of information sharing by evaluating the current state of the service development process and its information flows. The primary audience of this research is service development responsible and management.

This research has characteristics of a case study as the research investigates a service development process and its information flows within a case company. The emphasis of the case study is to gain understanding of the object through meaningful data gathering from different sources and using different data gathering methods (Koskinen et al. 2005, 157-158). In this research the source of data is mainly the population involved in service development process, the stakeholders, but also documents and other written materials are used.

The case study investigates a case or multiple of cases which can be a single actor like an individual, a group, a process or a product, and the case study approach can be descriptive, explanatory or exploratory (Gillham 2000, 1; Swanborn 2010, 2; Simons 2009, 4; Yin 2003 , 5). The case study's purpose is to provide in-depth understanding and present absorbing evidence of the phenomenon (Gagnon 2010, 3). Sypher (1997, 3) argues that the case studies "allow us to experience the experience of organizational life in ways that are often better than the experience itself". The case study research explains the usefulness and necessity of a research object in a surrounding operational system (Routio 2007, 1). Also the case study sits well into a research when studying social processes like people's behavior in certain context or people's interaction between each other (Swanborn 2010, 26). Though the case study has many strengths it also have weaknesses as it can be time-consuming, the results cannot be generalized and the research can become so unique that it cannot be transferred to another researcher (Gagnon 2010, 3).

One key characteristic for the case study is to use different methods to gather data and the methods can be either qualitative or quantitative (Swanborn 2010, 21). In this research many qualitative methods are used as the research environment is not known well, the stakeholders are not identified fully and the subject is based on researchers own experiences and assumptions. The gathered data can be divided into primary and secondary data. The primary data is closest to the event and it can be gathered by observation and through experience, when secondary data is written rendition of the primary data (Kumar 2011, 139; Walliman 2011, 69). When starting the research the primary research will be observation to gather data

and knowledge about the service development process and the stakeholders. In parallel the secondary data gathering method will be executed by reviewing and analyzing service development process flow chart and other relating documents. Enough basic knowledge enable to start discussions about the information sharing and communication practices, the stakeholder information requirements and process role in supporting and encouraging information sharing and communication. These discussions are executed by using unstructured interviews.

Observation

Observation is used to investigate actors' behavior and interactions in service develop process. Observation is suitable method when information about people's actions, interactions or behavior in certain context is needed and information cannot be provided with other methods (Kumar 2011, 140). Observation is also more than just observing the object. Also the place, time and object are decided, and during the observation the researcher listens, watches, and asks questions and records answers (Hemmink, Hutter & Bailey 2011, 170). In participant observation the researcher actively takes part of the activities, interactions and events of a group of people being studied (DeWalt & DeWalt 2011, 1). In this research the observation is used for identifying stakeholders and to observe stakeholder behavior in service development process related situations.

Written material analysis

Written material sources are important and should be included in every research. Written material intends to find data from documents, archives, journals, memos and charts to mention few. Many times written material is used for preparing to the actual research. (Järvinen & Järvinen 1996, 111; Koskinen et al. 2005, 130-131). In this research to support latter mentioned primary data gathering methods the documents and materials about the service development process is collected and analyzed. The essential written material to be reviewed and analyzed is process description but also other available material, if any, will be reviewed. The written materials will be analyzed from information flow perspective.

Unstructured interviews

Interview is one-on-one method to gather information directly from the people (Kumar 2011, 144). When using unstructured interview method the researcher is somewhat familiar with the topic but wants to give an interviewee a possibility to lead the conversation to the direction that may produce data that cannot be captured otherwise. Unstructured interviews are beneficial when the interviewees have difficulties to understand the questions, or if the interview topic or situation is uncomfortable to the interviewee. (McNeill & Chapman 2005, 57) Unstructured interview is used to gain in-depth understanding of the phenomenon (Kumar 2011, 160). Unstructured interviews are used to understand the level of current information sharing and communication, and also to identify possible barriers.

1.5 Thesis structure

The structure of the thesis consists of three entities: theoretical part, empirical part and the conclusions. The thesis is based on the research aim and the aim generates the research questions supported by the theoretical framework. Theoretical framework establishes grounds to the data collection and analysis, and further to answer to the research questions. Research findings are used to generate proposals and conclusion.

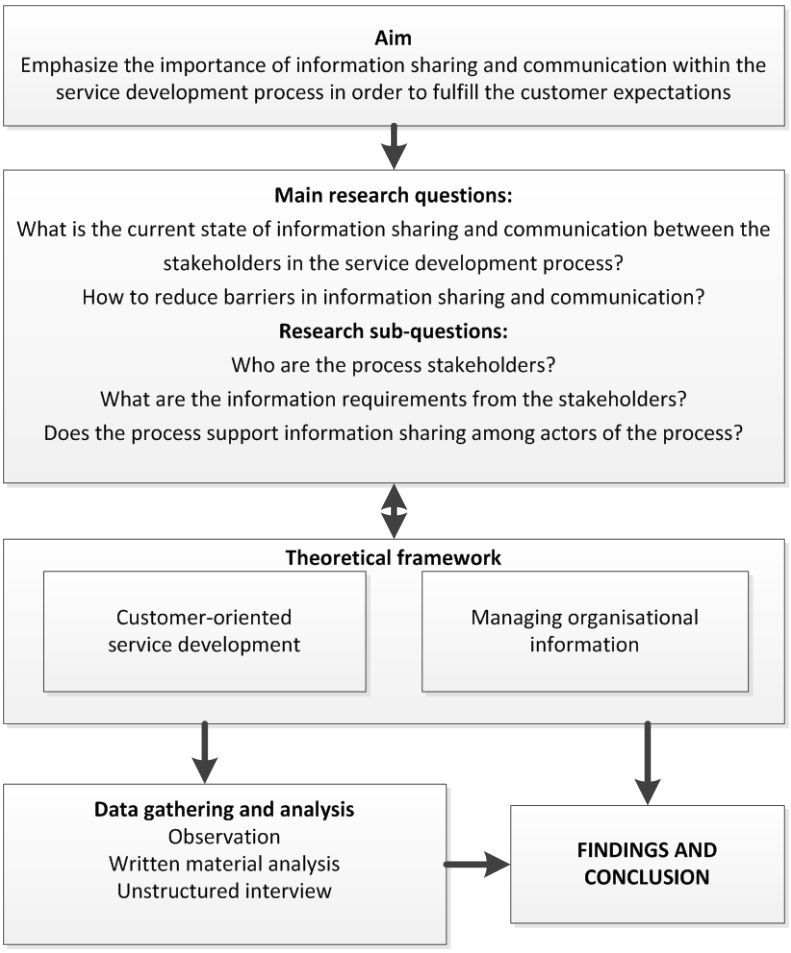

FIGURE 2. Study design.

Figure 2 visualizes the design of the study by describing the aim, research main and sub questions, theoretical framework including two concepts: customer-oriented service development and managing organizational information, data gathering and analysis methods, and findings and conclusions.

2 INFORMATION SHARING AND COMMUNICATION IN CUSTOMER-ORIENTED SERVICE DEVELOPMENT PROCESS

In order for it to work at all, it all must work together.

Ellen Ward

The world has become increasingly dependent on services. Majority of people in developed countries are working for service sector. Customers are expecting better service faster. Instead of receiving good services customers are expecting to receive experiences. In an ever-changing and increasingly competitive market situation developing services that meet customer needs and expectations have become key element for success. (Krishna et al. 2010, 1; Lovelock et al. 1999, 6-7) This chapter focuses on reviewing literature covering the subjects of customer-oriented service development, and organizational information sharing and communication.

The beginning of the chapter discusses about the customer-oriented service development. This part of the chapter explains three important entities of customer-oriented service development which are the service characteristics and development, product and service development process models and participant role in service development. Service characteristics and development entity discusses about the service definitions in order to understand the nature of a service, introduces success and failure factors identified by the literature and also familiarizes with the concept of service newness. Then different development process models are introduced and compared. As the product development process is researched more widely and thoroughly, a generic model of product development process is reviewed as a baseline for reviewing more diverse service development processes. Finally the participant role in service development is discussed. The participants included in this research are acustomer and the stakeholders.

The chapter ends with the organizational information sharing and communication. Information is very controversial term and therefore the information is defined profoundly. Also the importance of information management is addressed. Finally organizational information sharing and communication is reviewed from different

angles. The purpose is to discuss information sharing in an organizational setting, in service development environment, in a controlled manner, acting as a key element for creating value for the customer.

2.1 Customer-oriented service development

Customers are only interested in the benefits of a product or a service that it delivers (Grönroos 2000, 3). Developing products or services is the future of the company (Rao 2011, 227). Development is all about going forward, trying to achieve something. It is also turning ideas into a practice and aiming to the future by creating new opportunities. (Ward 1998, 12). The goal of product and service development is to translate the company strategy and customer needs into a product or a service.

Though the service industry is growing and many people are dependent on services, the service development and its processes are not profoundly covered in literature. Moreover the service development process is a reflection of a product development process. (Fitzsimmons & Fitzsimmons 2000, 27) When examining the service development process, the special characteristics of how a service differs from a product must be considered (Reinoso et al. 2008, 2922).

2.1.1 Service characteristics and development

In this part the discussion is concentrating on service. In order to understand further the development of a service and th customer expectations towards a service, it is essential to examine the nature of a service. To support the research the service characteristics, service development success and failure factors, and newness of a service are discussed.

Service characteristics

Service is a complex and therefore widely defined phenomenon. Grönroos (2000, 47) states that instead of defining the service phenomenon, the service researchers should concentrate on studying the service characteristics since that would contribute more on understanding of the real nature of a service. Next the definitions and characteristics of a service are discussed.

According to the most acknowledged service definitions, a service constitutes as follows:

> *A service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.*
> (Grönroos 2000, 46)
>
> *A service is a time-perishable, intangible experience performed for customer acting in the role of co-producer.*
> (Fitzsimmons & Fitzsimmons 2004, 4)
>
> *Services are deeds, processes, and performances.*
> (Zeithaml & Bitner 1996, 4)

Altogether the common accepted attributes for a service are: a service answers to the need or the requirement, an interaction between a service provider and a receiver is needed for service delivery, a service is expected to add value to the customer, and a service cannot be owned (Grönroos 2007, 53-54; Lovelock et al.1999, 18-19). Grönroos also indentifies that there can be two types of services and customers; professional services or another type of a service, and a service can be provided to the customers or organizational buyers.

The nature of a service differs from a product because a service is produced and consumed simultaneously (Rao 2011, 220). When a product is considered as a thing, a service is rather a performance (Lovelock et al 1999, 6). Common sense says that the difference between a product and a service culminates to their forms. A product is material, it has a physical form, something that can be touched, seen, stored or taken home. A service, on the other hand, is immaterial which means

that it doesn't have a physical or material form. The IHIP model, though controversial among scholars, is so far the major contribution to the service classification (Macintyre et al. 2011, 20). IHIP model describes the four typical characteristics of service which are intangibility, heterogeneity, inseparability and perishability.

Intangibility, as mentioned before, is a reference to the physical form. Service receiver cannot visually check if the purchase meets the requirements.

Heterogeneity addresses the service's uniqueness, the delivery of a service differs from the nature each time though the service is the same. The delivery time and quality of a service are not consistent and experience varies.

Inseparability means that in order to consume the service a customer has to interact with the provider, it reflects to the customer's role as a co-producer of a service.

Perishability is inability to store a service. Service cannot be put on a safe or storage for a later usage.

These four characteristics are to be considered when defining the concept of a service. (Reinoso et al. 2009, 2922)

Service development success and failure factors

Existing studies of the service development success and failure factors mainly share the overall understanding .but at the same time they address the environmental aspect as the service nature differs in different environments. Consequently ICT based study is presented separately from studies covering other industries. The studies also stresses that the literature is very fragmented and the findings cannot be generalized. Further studies are needed.

Many service development studies have focused on extensive review of service development literature in order to provide an overview of the success and failure factors in service development. As the literature is very fragmented, many success and failure factors were found, but the following are the most influential success factors entities to support this study: employee expertise and involvement, service development formalization, customer involvement, information management and cross-functional involvement.

Employee expertise and involvement refers mainly to the front-office employees who are the face of the company. Front-office employees like customer service, sales and service delivery are acting as a bridge between the customer and the company. These people have extensive knowledge of customers and market situation, and therefore their involvement can make a difference in service implementation (Jong & Vermeulen 2003, 13). Involving front-office employees to the service development can have a positive influence to the front-office employees' attitude towards the service (Jong & Vermeulen 2003, 13; Tatikonda & Zeithmal 2002, 220). In order to foster the employee expertise the training and information about the new service or product must be provided (Reinoso et al. 2009, 2923).

Alam & Perry (2002, 7) emphasize the role of knowledge and information management in service development. According to their study, the easy access to the critical information creates competitive advantage. The information management aspect can be linked to the cross-functional involvement. The development of a service can suffer from fuzziness due to the involvement of many cross-functional stakeholders who have different backgrounds and expertise (Milner 2000, 26). Therefore it is important to interact and build teams that efficiently work together despite of the distance. It is also important to gather the useful information and make it available for the stakeholders. (Posselt & Förstl, 13)

Formalized process can offer tools to overcome the service development challenges as it can reduce activities that don't add any value, and on the other hand improve communication (Milner 2000, 26). Highly formalized process helps to endure in challenging market environments and is beneficial in reactive service development (Reinoso et al. 2009; 2921). On the other hand the formalization of a development process should be in an appropriate level to support the development environment (Ojanen et al. 2009, 3). Innovative and rapid development environment could benefit from less formalized process. Tatikonda & Zeithaml (2002, 201) have adopted a customer-oriented approach and describe the service development as a customer value adding process that links all necessary functions within the company together.

Customer is the most influential success factor in a service development. Customer involvement is essential during the whole service development as the customer has a positive impact from idea generation to service launch (Posselt & Förstl, 11). Alam & Perry (2002, 8) discusses the customer's role in service development as a co-producer. Customer inputs should be gathered regularly for innovation purposes. The role of a customer in service development will be discusses more profoundly later on.

ICT industry differs from classical service providers from a nature of a business. To support this thesis the ICT industry specific success factors will be discussed separately. Ward (1998, 24-26) has an extensive experience working in ICT industry and she has studied the common challenges in ICT service development. The problems she had identified include the following: poor communication across organizational boundaries, lack of a regular product development process, customer requirements are not understood, not validated or not defined, too many projects, lack of experienced personnel, and poor linkage to the resources needed to complete development projects. Ward (1998, 24) argues that most ICT service providers are poor in developing services. Many problems are due to the fundamental grounds for the service development, the understanding of customer needs and frustrations.

The factors in service development that may contribute to the success seem to be similar between the all industry studies compared to ICT industry specific. They both emphasize the need for formalized process, customer understanding, cross-organizational communication and skillful employees. Latter three success factors could be enhanced and supported by the formalized service development process which is generated and formulated to fit into the exact organizational environment.

Newness of a service

Until proceeding with the review of different service development processes it is important to understand the level of newness of services in service development.

Because the level of newness can vary it is chosen in this thesis to discuss about "service development" in general instead of "new service development", which is very commonly used expression in business literature. As an example, in ICT industry the services are mainly service modifications, again depending on how the newness is comprehended. In other words the new services are not new in a same degree. Fitzsimmons & Fitzsimmons (2000, 4) has categorized the service innovations into six levels which are viewed in table 1.

TABLE 1. Service newness categories (Fizsimmons & Fitzsimmons 2000, 4, adapted from Heany 1983 and Lovelock 1984).

New Service Category	**Description**
Radical Innovations	
Major, radical innovations	Completely new innovation that create new markets
Start-up businesses	New service for existing market
New services for the currently served market	New service offering offered to existing customers
Incremental innovations	
Service line extensions	Augmentation of the existing service line
Service improvements	New or changed features to the existing service
Style changes	Changes to the appearance of the service

The level of service newness can also influence to the customer role and involvement in service development. Fizsimmons & Fitzsimmons (2000, 5) argue that the stakeholder involvement and information sharing varies depending on how new the service is, e.g. in ICT industry the small service improvements can be implemented with less effort if stakeholders are involved to the development in early phase.

2.1.2 Product and service development process models

The anatomy of a process is to be a discipline that challenges and defies status quo. Process is an iterative learning cycle which, in ideal case, leads to the better understanding and continuous improvement. Processes of developing products and services are the future of the company (Rao 2011, 227). Customers live their lives with needs and frustrations, while companies try to understand the customer requirements and to translate them into a service or a product. Researchers suggest that the company with a well-defined, formalized development process is more like hood to achieve success (Tatikonda & Zeithalm 2002, 229).

The service development process is not well documented compared to product development process (Alam & Perry 2002, 1). The literature mainly concentrates on service marketing where service development is very briefly discussed and the process of developing a service is similar to the product development process. The lack of service development process literature explains the phenomenon that the service providers commonly develop their services according to the successful product development process. (Fitzsimmons & Fitzsimmons 2000, 16-17) As discussed earlier a service differs many ways from a product and therefore development models should be considered accordingly. (Reinoso et al. 2008, 2922) Service providers should understand that they develop services and instead of using product development process they should adapt a service development process.

The service development process literature and researches are either focusing on literature reviews to picture an overview of existing models or suggesting new models. There doesn't seem to be a commonly accepted model for service development process. To serve the purpose three different models are chosen to be reviewed in here, just to argue that the service development process is challenging and very dependent on the company’s operational environment.

Before diving into the service development processes it is important to review the product development process. The product development process is widely and profoundly studied subject (Melton 2008, 7) and the process model chosen to be reviewed here is a generic development process based on Ulrich & Eppinger's

(2008, 9) view. The purpose to go through the product development process is the fact that the most of the service development processes are based on the product development process (Fitzsimmons & Fitzsimmons 2000, 27). After reviewing the product development process it is natural to evaluate the current literature of service development process. The goal is to understand the differences and to address the attributes needed for the customer-oriented service development.

Generic product development process by Ulrich & Eppinger

According to Ulrich & Eppinger (2008, 11-12) the product development process is a sequence of steps or activities which an enterprise employs to conceive, design and commercialize a product. The generic product development process has six stages which are visualized in figure 3. Every phase has its input and output, and before moving into to the next phase the decision to approve proceeding is made. Ulrich & Eppinger approach to the product development is very manufacture-driven and therefore creates a presumable contrast to the service development.

Product development process

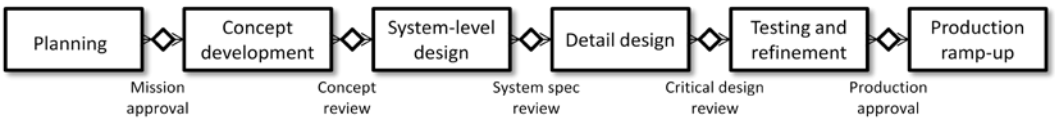

FIGURE 3. Generic product development process with six phases (Ulrich & Eppinger 2008).

The product development is never perfect in a real life and phases do not necessarily happen in sequences. Some development activities are overlapping or development requires iteration. Ulrich & Eppinger pay a lot of attention to the front end process in product development and stresses its importance for successful development. The front end process intends to a concept development. Ulrich & Eppinger also argue that concept development may be the most demanding phase

in product development as it requires more cross-functional involvement and coordination. To gain overall understanding of the steps and activities performed within the product development process, the content of six phases in a process are introduced next by adapting Ulrich and Eppinger generic product development process (2008, 12-15; 30; 50; 68; 90; 120; 159).

Planning

The product development can create something completely new or modify existing product. There are many methods of how companies categorize the newness of a product and the level of modification of a product. The first stage of a product development process is planning, which is a preparation to the actual development process launch. The input to planning stage comes from company's strategy, market objectives and technological capabilities which also can generate different product ideas. Ideas for product development come from several different sources to the funnel, as Ulrich & Eppinger call it, which collects the ideas. These product ideas are then evaluated and prioritized by reflecting them to company's strategic, technology and portfolio plans. Resource and investment requirements for selected development projects are allocated. As an output the mission statement is prepared including: the product description, benefit proposition, business goals, target markets, critical assumptions, and the product's stakeholders. Activity-steps in a planning stage are: identifying opportunities, evaluating and prioritizing projects, allocating resources and planning timing, completing pre-project planning and reflecting on the results and the process.

Concept development

The concept development phase involves creating new aspects and information that can force to take few steps back and consider proceeding again. In order to completely translate customer needs into a product concept the development needs iteration. The concept development phase input is the mission statement from planning phase. According to the statement customer needs are identified more profoundly. The goal of customer needs identification is to ensure that all critical customer needs are understood among the development team. The product should always fulfill the customer expectations and therefore customer needs are

the basis to the product specifications, and the generation and selection of product concepts. The product specifications are very detailed information about what the product has to do. The first set of specifications is established after indentifying the customer needs. Target specifications and customer needs are drivers to start generating the product concepts. The product concept is a sketch of a product form, functions, features, technology and principles, with an exhaustive description of how the product satisfies the customer needs. After the concepts are generated, selected and tested the product specifications have become more accurate and formed into final specifications. The output from this phase is development plan including final product specifications, a project plan, prototypes and models, and financial and competition assessments. During the concept development all information created should be documented to "contract book". The concept development phase consists of seven activity-steps: identify customer needs, establish target specifications, generate product concepts, select product concept(s), test product concept(s), set final specifications, and plan downstream development.

System-level design

This phase acts as a bridge between an abstract product concept and detailed design of a product. Literally it is more or less enabler to put the bits and pieces together, and also to understand the connection between the bits and pieces and how they worked together with the environments. The bits and pieces include e.g. product plan, service issues, product architecture, major interfaces and subsystems, target costs, supplier identification. During this phase the architecture, subsystems, components relating to the product are explored. The output of the system-level design is the decision about the subsystems and components, and their functions, the geometric product layout, and details about the product assembly process.

Detail design

Detail design phase is when the bits and pieces are put together as a complete product specification. This includes decisions about the materials, geometry, tolerances, suppliers of a product and its parts. At this point the development of the marketing plan also starts. The output of detail design phase is a control documen-

tation that includes all information about the product that has been created during the design process, e.g. a description of geometry of each part of the product and its production tooling, the information about the purchased parts from suppliers, and the assembly process guidelines.

Testing and refinement

Before transferring the product to production it requires proper testing. Testing and refinement phase is about ensuring the successful production by simulating the production process in order to validate the design and functionalities. The testing is divided into alpha and beta prototype testing. Alpha prototype is the same material and geometry as in design but the production process does not need to be precise. Testing is executed by internal testers. Beta prototype testing on the other simulates more the target product and is extensively tested internally. Beta prototype is also tested with the customers. The prototype testing provides information about the product quality by identifying the performance and reliability strengths and weaknesses. The output of testing and refinement phase is approval to transfer the product to the production.

Production ramp-up

The goal of production ramp-up phase activities is to ensure the ability to start ongoing production. During this phase the product is launched and made available for target markets.

In addition to the process phases and activities; the roles, responsibilities, decisions and information play also important role in product development process. The roles and responsibilities are vaguely described in Ulrich & Eppinger's product development process. They emphasize the importance of understanding profoundly the customer needs and ensuring the cross-functional co-operation especially in the front-end of the process. In overall the roles identified are rather generic functions inside the company which are extended with the external suppliers and the customer. The customer role is only involved in the product development at the beginning when identifying the customer needs, and in the end when testing the beta prototype. The main roles with responsibilities are: marketing, design,

manufacturing and other functions. Other functions involves: research, finance, legal, general management, service and sales. It can be assumed that the authors leave room for adjustments when adopting the process as environments can vary. Also it is not clearly defined who makes the decisions. The process follows the stage-gate model in some respect and at the end of every phase the decision of whether to approve or disapprove proceeding to the next phase is made. In order to make the decision naturally requires information. Every phase is assessed by the decision-makers and the approval is granted based on the information they have received. As Ulrich and Eppinger conveniently state the product development process can also be considered as an information-processing system where different activities create and process the development information and the process comes to an end when all required information is created and communicated. This generic process review builds a bridge to the evaluation of a service development process, and the discussion of similarities and differences between processes of developing tangible and intangible deliverables.

Service development process by Tatikonda & Zeithaml

Tatikonda & Zeithalm (2002, 206-208) have studied new service development process literature from service operations, service marketing and product innovation perspective, and accordingly have also provided an overview to the services development process or as they call it, services new product development process. As a result of their research they adapted a process with a three macro-stages: the front end, the back end and the product introduction. Their study mainly discusses about the front end and the back end of the process. The process stages and steps with activities are presented in a table 2.

It is noted that the process is very iterative and not every step needs to be fully followed in practice. They emphasize the importance of front-end activities due to the fuzzy front-end phenomena in product development process. The front-end of the service development is called fuzzy due to its abstractness, which in worst case can generate weakness to the process in whole (Tatikonda & Zeithalm 2002, 206) The fuzzy front-end describes the relationship between the development process' front-end (marketing-oriented) and the back-end (operations-oriented).

These two can become too isolated from each other leading to the lack of information sharing which further can cause confusing service specifications (Menor et al. 2002, 146).

TABLE 2. Archetypal macro-Stages, Steps, and Element in the Service Development Process (Tatikonda & Zeithalm 2002, 207).

Macro-Stage	**Major steps**	**Activity element**
Front End	Strategic positioning	– Determine market opportunities or niches – Define how a potential new service is different from extant services – Determine the congruence between a given market opportunity or potential service and the company's strategy and competencies
	Idea generation	– Encourage and collect many ideas for a new service that may fill the market position
	Concept development	– Screen and refine the abstract ideas into a single, less abstract service product concept – Employ early prototypes (drawings, flowcharts) to communicate the concept to and obtain feedback from stakeholders (including customers) – Clearly define the service concept (via an iterative process employing the early prototypes)
Back end	Concept implementation	– Create implementation plans to physically realize the service concept – Develop personnel procedures and training ; design and select supporting goods and materials ; design and test the service facilities (both front room and back room); refine the overall sequence of steps in the service-delivery process – Iteratively develop and refine the overall service delivery – Process model and specific elements of the service
	Full prototype tests	– Test, in a real-world or simulated environment, the complete fully implemented service-delivery process
Product introduction	Market rollout	– Rollout the service to one or more sites (product launch and market ramp-up)
	Performance evaluation	– Analysis of market and operational results continuous improvement of the service-delivery system

Tatikonda & Zeithalm argues that the front end steps need to be completed until the back end activities can be initiated. When the front end has developed the service concept, the back end will take over and develop the delivery system for the service. In order to avoid the fuzziness, the chosen service concept needs to be well defined and appropriately positioned. Tatikonda & Zeithalm are suggesting

that in order to link better the front end and the back end, the service architecture needs to be understood. With the service architecture they mean translating the service concept in a detailed service delivery system. The service architecture has four categories: process, people, facilities and goods. These four categories have specific elements that are required to be developed in the back end. It is noted that some tools, like blueprint, could be useful for building the service architecture. The service architecture would be as its simplest the complete list of elements, with complete information about all factors affecting them, that need to be developed within the four categories mentioned earlier.

Service development process by Ward (ICT)

Ward (1998, 42-49) has introduced a six-phase process for ICT product and service development. Ward, as well as Ulrich & Eppinger and Tatikonda & Zeithalm, emphasize the iterative and overlapping nature of different phases shown in figure 4. Ward argues that when the process is not linear, the development work should not be reviewed only at the end of every phase, but during the phase as an iterative, cross-functional co-operation.

The six phases of development process are opportunity analysis, definition and feasibility, design and testing, development, implementation and trials, and commercialization and review. The phases include activities that have to be finished before moving forward to the next phase. Next the main activities of each stage are described.

Product/service development process for ICT

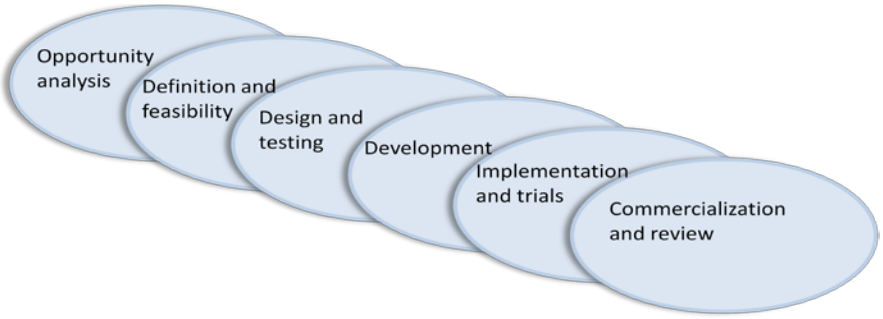

FIGURE 4. The six phases of ICT product/service development process and its overlapping nature (modified from Ward 1998, 42-43).

Opportunity analysis

In this phase product or service concepts are reviewed and validated. Company will evaluate whether the required conditions and resources to deliver the service are available. Preliminary assessment of supportive and operational systems is started. At end of the phase initial business case is prepared and approved, target product specifications are set and assessment report is done.

Definition and feasibility

The outcome of this phase is the final product specifications in order to enable designing to be initiated. At this point all supporting processes like network, technical, operational, sales, customer service, billing etc. are assessed to ensure capabilities. The blueprint of the product is done with all feature and functions. The documentations are revised, as well as the product specifications and the business case.

Design and testing

Ward emphasizes that this phase is the most complex as the network infrastructure and business process infostructure are brought together which requires cross-functional cooperation. Network related design configurations and other elements are defined. Operational support systems are identified, defined and specified. Business processes for delivering the service are assessed for development. Network infrastructure, support systems and business processes must work together synchronized and integrated, therefore this phase is highly iterative as new information is created along the way.

Development

The development for every single part is carried out in this phase. Besides developing the actual service the other processes that support the service when it is introduced begin to develop their capabilities and deliverables. At the end of this phase the whole organization is prepared for trials.

Implementation and trials

There are two main purposes for this stage. First is to make sure that the organization and supporting functions will do their share for the service delivery. Second is to carry out testing to verify that the service is working accordingly. Trials are divided to alpha and beta tests, alpha test are done in simulated environments and beta is with selected customers.

Commercial launch and review

The service will go live now. All previous phases have been a preparation and optimization for this phase. As delivering a service requires several tasks operating simultaneously the service can be launched in sequences. This phase will tell how the customer will receive the service. The post launch review is held to ensure that all unfinished tasks are completed.

Service development process by Edvardsson and Olsson (ICT)

Edvardsson and Olsson (adapted from Lovelock et al. 1999, 407-410) have also studied service development processes in ICT environment and they have adopted quality-oriented approach which addresses the creation of proper preconditions to add value to the customer. Edvardsson and Olsson suggest that the service is a customer perception of the outcome and the quality is the customer's satisfaction towards the service. Based on their studies they present a new model for service development process that has three main types of development: the development of the service concept, the development of the service system and the development of the service process. They view the process in higher level as seen in figure 5 and do not offer traditional process steps. The three main types of development include similar activities as the other processes emphasizing the role of a customer process.

In their service development process model, Edvardsson & Olsson address strongly the quality aspect and they suggest that involving the customer to the service development process the experienced quality can be better assessed. The relationship between service concept, service system and service process is important as these three must be coordinated during the service development process.

Service development model

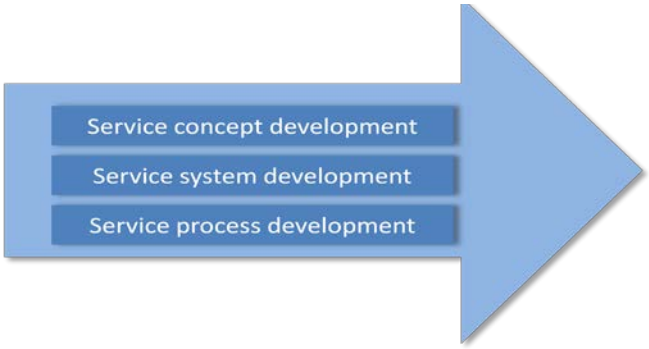

FIGURE 5. Model of the service development process (Edvardsson and Olsson adopted from Lovelock et al. 1999, 409).

Service concept development

The service concept is defined as "a detailed description of what is to be done for the customer and how this is to be achieved". In service concept development ideas are evaluated and a concept developed. Edvardsson and Olsson draw attention to the customer's primary and secondary needs which have direct reflection to the core service and supporting services. The main goal of a service is to fulfill the customer needs, when the supporting services add value to the customer experience. ICT service providers acknowledge this challenge as the core service is only the tip of the iceberg and customers are expecting to receive more in a reasonable manner.

Service system

In order to actualize the service concept Edvardsson and Olsson present a service system development. The service system refers to all resources needed to realize the service concept. The service system development includes specifying needs for a service concept, assessment of current service system and details design description of a service concept. They have indentified four main resources of service system: employees of the organization, customers, technical/physical environment, and organization and control. In order to develop the service system the resources need to meet the expectations as follows. Employees are expected to be highly motivated, trained and have a required knowledge to manage the crucial role in delivering value to the customer. Customers on the other hand are co-

producers and they hold the key role in service system. Technical resources should support the delivery of quality services. And the organization requires development too; the roles, responsibilities, information, interaction, culture, values to support the service system.

Service process

The service process is the process of delivering and producing the service to the customer. In order to do so detailed specification of activities are needed for service generation. Blueprints are suggested for better visualization of the service production. The service process should be developed hand in hand with the service system. Other important activities and information is produced for service launch.

The three different service development processes have similarities but with their own twist. Overall the content of what needs to be done during the development process seems to be quite similar, with of course some exceptions depending on the industry. The iterative nature is distinguishing, though Edvarsson and Olsson do not address it, their three main types of development working in sequel and quality-orientation requires iterative approach. The roles and responsibilities are blurry. Ward stresses the role of supporting function and that whole organization should be ready for launch of a service. Edvardsson & Olsson have similar approach and they emphasize the supporting services that fulfill customer's secondary needs. The customer role as co-producer is not evident though the customer is involved and varies between the process models. Edvardsson & Olsson's model presents that the service development is a customer process and developing services should above all add value for the customer. All models emphasize the importance of the planning phase, also the link between planning and designing the service. Altogether the process flow should be transparent, sequential and iterative. Organizational stakeholder and customer involvement is crucial.

It becomes clear that the service development process in ICT environment differs from other industries as the service itself and the delivery system is very complex. When planning an ICT service or a product the involvement of different functions

is critical. It requires organized and synchronized cooperation across the organization. Establishing development process can therefore become an overwhelming effort. Dynamic industries like ICT are forced to consider their development activities in order to respond to the market requirements better and faster, and therefore the alignment of business objectives and service development is very important. The nature of developing services is mainly ad hoc due to challenging and demanding market environment and the complex nature of a service which is actually a continuous delivery system and in many cases involves also a physical product like a mobile phone or a modem.

After reviewing the literature and the studies about the topic, building picture of generic product development process and reviewing three different service development processes the differences can be identified. The major identified differences are the customer involvement during the development process, the genuinely iterative nature of the development process, and the process output. In addition to the latter findings Menor et al. (2002, 145) suggest that a service needs to be tangibilized, have a prototype or a blue print to ensure that everyone in development process share the common understanding of the goal and works towards the same goal. They also note the coordination needs between the front-office and back-office, though these two have totally different objectives, they still need to work as integrated to provide combined service.

Especially in ICT industry the development process output differs from product development. A service in ICT industry is an ongoing delivery process that has to be maintained and monitored 24/7. Developing the ICT service is actually a development of a delivery and operational processes. (Pang 2009, 8; Ward 1998, 14-15). Another extremely important key factor in ICT service development is a customer involvement in different phases during the development process. The role of customer in service development will be discussed next in this chapter. In a process of developing a service the customer can act as a co-producers or even an employee, the customer can influence to the service development and define in more detail the needs (Tatikonda & Zeithalm 2002, 221). It is more natural to involve a customer to the service development than to the product development, as

the customer has a relationship with the service provider and an ideal case has a direct communication channels with the service provider. The challenge is to find a proper way to engage the customer to the service development process.

2.1.3 Participants in service development

Previously the success and failure factors of service development were identified and the role of right people was seen one of the key success factors. Especially the customer involvement and the frontline employee engagement are essential for service development (Melton 2008, 13). Edvardsson and Olsson (1999, 407-410) also emphasize the role of employees of the organization (internal stakeholders) and customers are part of the service system. Gummesson service quality model in figure 6 describes the service development dependencies from customer perceived quality perspective, e.g. the design and engineering are dependent on the staff and the customer feedback, and further the design and engineering has an influence to the production and delivery (Edvardsson et al. 2006, 85-86). Next the two participant roles important for the research of this thesis are discussed; the internal stakeholders and the customer. The emphasis is on customer role but the stakeholder role is shortly identified and later on is in more detail discussed through information sharing models.

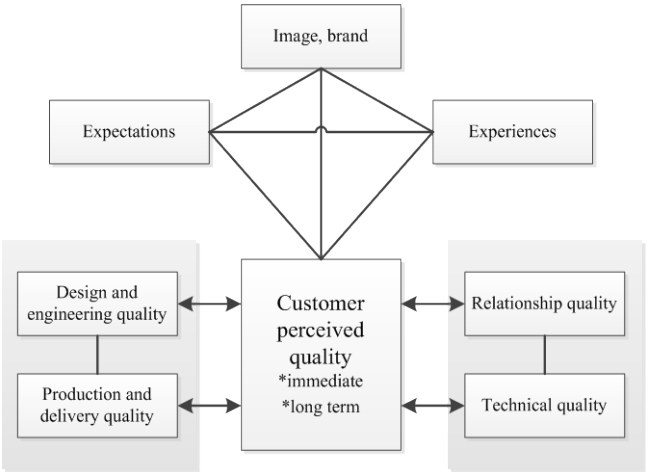

FIGURE 6. Service quality model (Edvardsson et al. 2006, 85, adapted from Gummesson 1996).

Stakeholders play an important role in company's operations. Stakeholders are either internal or external individuals or group of people who are involved in or affected by the activities in an organization. (Ranchhod 2004, 48; Schwalbe 2006, 71). Very important group of stakeholders are the company's own employees (Ranchhod 2004, 56). Stakeholder role in service development is crucial for the company's success. Stakeholder commitment can be improved by identifying right stakeholders and by meeting the stakeholder requirements (Bourne 2006, 138). Stakeholder role will be discussed in more detail by using different models in next chapter.

Customer has a crucial role in service development. Developing a service is practically an iterative discussion with the customer. Without understanding profoundly the customer's frustration and needs it is impossible to create value for the customer. In other words understanding requires bringing the customer closer to the company. For some reason customers seem to be a paradox for companies and therefore a relationship can be very distant and complex. But in real life the customers are actually only humans sharing the same needs, desires and frustrations as the people representing the company. Merholz et al. (2008, 2) emphasizes the people-oriented approach towards the customers and suggest that customers can be understood better if they are seen and treated as people instead of consumers. This mindset can be fundamental discovery for the service providers as customer needs change along the way. Therefore the success lies on continuous discussion between the service provider and a customer throughout the whole service lifecycle (Reinoso et al. 2009, 2923).

Iterative service development with the customers is a good way to fully understand the customer needs as it allows company to question and discuss with the customer during the development (Alam 2006, 25). The first impression the company creates about the customer needs can be false, therefore the customer involvement through different development stages can crystallize and strengthen the customer needs to the development team members (Table 3).

TABLE 3. Customer activities at key stages of the service development (Alam, 2006, 27).

Development stages	Activities performed by the customers
Idea generation	Describe needs, problems, and possible solutions; suggest described features, benefits, and preference in a new service via brainstorming or focus group sessions; identify problems not solved by the existing services; evaluate existing services by suggesting likes and dislikes; identify gaps in the market; provide a new service wish list.
Idea screening	Suggest rough sales guide and market size of various new service ideas; rate the liking, preference, and purchase intents of all new service concepts; critically react to the concepts by analyzing how they would meet customers' needs; compare the concepts with competitor's offerings; examine the overall salability of a new service.
Business analysis	Limited feedback on financial data, including profitability of the concepts, competitor's data.
Formation of cross functional team	Join top management selecting team members.
Service design and process / system design	Jointly develop initial service blue prints; review and evaluate the initial service blueprints to crystallize the concepts; suggest improvement by identifying fail points in service delivery; observe the service delivery trial by the front-line service personnel. Compare their wish list with the proposed blue prints of the service.
Personnel training	Observe and participate in mock service delivery process by the key contact employees; suggest improvements
Service testing and pilot run	Participate in a simulated service delivery process as a customer; compare their wish list with the proposed initial service blue prints.
Test marketing	Provide feedback on various aspects of the marketing strategies and suggest desired improvements; give input to sharpen sales arguments and advertising themes; examine the overall salability of the new service.
Commercialization	Adopt the service as a trial; provide feedback about overall performance of the service along with the desired improvements, if any; offer word of mouth communication to other potential users.

Service development in particular is about creating great experiences to the customers. Customers are not necessarily interested in technology needed for the service delivery but they are definitely keen to receive a satisfying experience. Therefore the focus should be on encouraging and maintaining the experience aspect throughout the developing process. (Merholz et al., 2008, 23) In order to discuss with the customer along the way in the service development process, the common practices like a well-defined process could be useful as the process ad-

dresses critical steps and channels to interact iteratively with the customer during the service development.

2.2 Managing organizational information

Information and knowledge are intangible assets to the organization. Information only becomes useful when it is used. To create value information has to be shared. (Powell 2003, 45) Information sharing among members of the organizations is the key for staying competitive (Hatala & Lutta 2009, 3). The lack of processes for gathering and sharing knowledge and information can cause collective memory loss (Day 1999, 103). Organizations have adapted technology-oriented approach to information management when instead they should consider information as a resource and trying to increase its productivity (Kaario at el. 2008, 4). In this chapter the information will be discussed as organizational asset and essentialness. The purpose is to understand the diversity of information and the importance on information sharing and communication within the organization.

2.2.1 Information definitions

When defining information, the two other dimensions, data and knowledge, need to be included. There is also a fourth dimension, intelligence or wisdom, which is only mentioned here but not defined in more detail. It is quite common that data, information and knowledge are used interchangeably, although they are quite different in nature (Berecca-Fernandez & Sabherwal 2010, 17). The meanings of these three terms can also vary according to the context. According to Powell (2003, 42) information can be seen as a chain of increasing value, from data to information and further to knowledge. The relationship amongst data, information and knowledge is actually generated from activities and situations, e.g. information can be stored as data and again data turned into information by analyses and processing (Liew 1997, 1). It depends on the context whether the subject can be interpreted as data, information or knowledge. Liew's argument emphasizes the importance of defining the terms that are used and focusing on wider view when

determining relationships of concepts which can be understood several ways. Table 4 shows some examples of how definitions differ according to the author.

TABLE 4. Data, information and knowledge definitions by several authors (modified from Liew 1997, 2-3).

Data	Information	Knowledge	Source
Numbers and words without comprehensive meaning. Message without a meaning is raw data.	Information is message that the receiver has given a meaning.	Interpreted information. Sometimes can be called wisdom.	Kaario, K., Peltola, T., 2008: Tiedonhallinta - Avain tietotyön tuottavuuteen. WSOYPro/Docenta-tuotteet
Data are elements of analysis.	Information is data with context.	Knowledge is information with meaning	Amidon, M., 1997: Innovation Strategy for the Knowledge Economy: The Ken Awakening. Butterworth-Heinemann
	Information is a flow of messages.	Knowledge is created by the very flow of information, anchored in the beliefs and commitment of its holder.	Nonaka, I., Takeuchi, H., 1995: The Knowledge - Creating Company – How Japanese Companies create the Dynamics of Innovation. Oxford University Press .
Data is a set of discrete, objective facts about event as structured records of transactions.	Information as message in the (various) form of communication to have an impact on judgment and behavior.	Knowledge is a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information.	Davenport, T., Prusak, L., 2000: Working Knowledge: How Organizations Manage What They Know. Harvard Business School Press.

The definitions also vary according to the viewer's background, e.g. professionals representing different branch of science have different views. In order to avoid inconsistency of the terms for data, information and knowledge in this thesis - the terms will be interpreted as follows:

Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized. Data mainly is stored and need to be accessed in order to be refined.

Information is processed, organized, structured or presented data in a given context so as to make it useful. Information does not have a form, it needs communication to be received.

Knowledge is information of which someone is aware. Knowledge is also used to mean the confident understanding of a subject, potentially with the ability to use it for a specific purpose.

2.2.2 Information management

As the distinction between managing information and managing knowledge is incoherent and many scholars have overlapping understanding (Bouthillier & Shearer 2002, 1), both terms are discussed but the thesis concentrates on using the term information rather than knowledge due to the fact that sharing information can be carried out using several different channels and methods. However the knowledge cannot be left outside as organizations are full of knowledge which needs to be transferred and made available between actors in a proper way. Also the thesis would like to underline that information sharing has it risks, like misinterpreting or misunderstanding when knowledge is transferred between actors in a form of information or data. Therefore the management of information should be well understood, organized and arranged before information can be properly and effectively shared and communicated (Choo 2002, 33).

As mentioned earlier information has many definitions and naturally managing information is equally controversial. In order to discuss more about information management the following expression by Gordon 2007, xxi) is used to crystallize the essential of information and its management:

> "Information is something communicated to a person...and the function of managing information is an enterprise resource, including

planning, organizing and staffing, and leading, directing, and controlling information."

Information is everywhere, new information is created all the time but without a proper utilization the information becomes worthless (Powell 2003, 45). Organizations are ever-changing environments where information is used for adaptation to the new situations (Choo 2002, 3). Information is also a key driver for corporate management (Picot 1989, 1). Organizations are empowered by the information which is processed, filtered and crystallized into knowledge that drives actions (Choo 2002, 223). Powel (2003, 49-49) has presented core aims for organizational information management. In *efficient organization* information is collected and distributed appropriately, available for needers and accessed easily. *Effective organization* ensures that the information is useful, good quality, and something one can learn from. Organization also recognizes the information needs. For *creative organization* information is a key for enhancing people's creativity. And for e*mpowered stuff and partner* the information availability creates better understanding of the situations, improve corporation and eases decision-making

Organizational information management can be mixed up with information technology (IT), when actually it is more a conscious process where information is gathered and used across the organization (Hinton 2005, 11; Choo 2002, xiv). Companies could have invested to fancy IT systems to store the information but still they are struggling with finding the right data, processing it into information and getting the information to those who need it (Day 1999, 104). The role of IT in information management is to enable better and faster information exchange among members across the organization (Daft 2009, 96). Information management is not just technology it can also be based on traditional paper or even human voice (Hinton 2005, 3).

Reviewing information management subject from ICT industry point of view Ward (1998, 36-37) suggests that actually entire information industry exists in two levels - infrastructure and infostructure level. Infrastructure corresponds to all

physical aspects of delivering the service, like network and its operational functions. Infostructure is about information, everything that is needed to carry information in a level of where customer will deliver the service. Many companies have recognized infostructure as a key element to compete more effectively in the future. Infostructure as Ward argues can be used as a tool to determine internal capabilities like; are all needed resources available for delivering the service and what is the skill set to offer this service

2.2.3 Organizational information sharing and communication

"Most organizations don't know what they know" (Day 1999, 104). Information only becomes useful when it is used. To create value information has to be shared. (Powell 2003, 45) People and information resources are needed together for company to achieve high performance (Hinton 2005, 10). Organizational operations and interactions that involve individuals create new information and knowledge. The challenge is that organizations are too complex with silos and matrixes, and therefore information can become inaccessible or even hidden (Day 1999, 104). Another challenge is that people and experiences differ and therefore some people have better ability to create new information, and are also more open to share their information with others. In other words individuals have diverse skills to transform the gained knowledge into information that can be communicated among other people. Next the subject of information sharing and communication and the role of stakeholder within it will be discussed from internal marketing and overall service experience perspective.

In order to translate the customer needs and frustrations into a product or a service, the profound understanding of the expectation towards the experience that customer is looking for is required. Naturally to gain the understanding requires good relationship and continuous discussion with the customer. Further, to ensure the delivery of a customer experience requires shared understanding of customer expectation among everyone involved in the service development. Common practices in information and knowledge sharing are needed to ensure that every development activity is adding value for the customer.

Internal marketing

Organizational information sharing and communication in a service management literature is principally discussed as internal marketing. Although the perspective is different the goals are similar. Internal marketing communication aims for delivering the service in efficient manner, improving trust and collaboration between the members of an organization and ensuring customer-oriented employee motivation (Lovelock et al. 1999, 318; Grönroos 2007, 386). Table 5 presents three conditions for internal marketing which are identified by Grönroos.

TABLE 5. Three conditions of internal marketing (adapted from Grönroos 2007, 336-339).

Internal marketing condition	**Definition**
A service culture development	Enhance customer- and service-orientation in organization by creating culture of positive relationships and a good communication, enabling members of the organization to understand and accept the business mission, vision and strategy.
Maintaining service-orientation	Creation of service culture requires maintaining activities. The customer is the focus and all activities must add value to the customer. Assurance that communication, interaction and feedback among employees are good, clear and constructive. Also communication about the new services is provided well before external launch
Introduction of goods, services, and activities relating to goods or services	The importance of preparing employees for planning or introducing new services or goods, or any activities involving marketing or launching the services or goods. Employees must be aware and accept the new services or goods, technologies, systems, routines etc.

Internal marketing is about creating an environment where customer comes first and all efforts are done to develop and to deliver outstanding services to the customers. The organizational readiness to serve the customer depends on the level of

information creation and sharing among employees. The management has crucial role in building the culture and environment that supports information sharing and communication.

Overall service experience

Another perspective to discuss about the organizational information sharing and communication is an overall experience that the customer is expecting. In a competitive market situation the core product or service can be exactly the same among competitors. To differentiate from each other the overall service experience can make a difference. (Lovelock et al. 1999, 300) Especially in the ICT industry the core service is pretty much the same, but in order to deliver the experience to the customer there are many supporting functionalities that create the overall experience to the customer. This means that although the service fulfills the customer requirements, if the customer cannot order the service or the service cannot be delivered as agreed, the overall experience will suffer. To understand the complexity of delivering overall customer experience the core and complementary services approach will be adopted. Lovelock et al. (1999, 298-310) have introduced a Flower of Service which displays the core of a product or a service and clusters of supplementary services that are needed to enhance the overall customer experience.

The Flower of Service

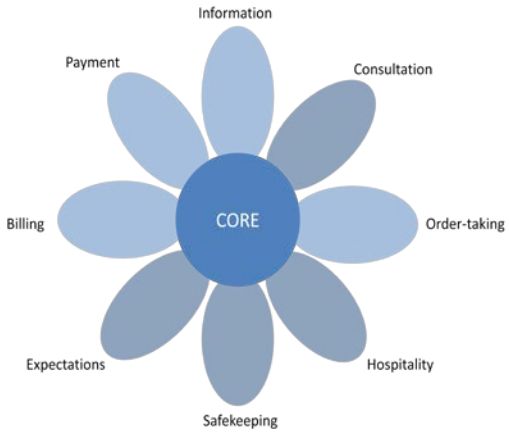

FIGURE 7. The Flower of Service (Lovelock et al. 1999, 299).

The Lovelock et al. model in figure 7 visualizes the dependencies of different functionalities that create the overall customer experience. The supplementary services are divided into facilitating services and enhancing services. Facilitation services are information, order-taking, billing and payment. Enhancing services are consultation, hospitality, safekeeping and expectations. The difference between facilitating and enhancing service is the form of a process; the facilitating services are merely information based when enhancing services require physical involvement (Lovelock et al. 1999, 300). The supplementary services according to Lovelock et al. are shortly explained next.

Customers need to have an easy access to the service *information* which is accurate and presented properly. This information can be e.g. a service description, pricing, instructions, warning and can be provided using different channels like internet or customer service. In addition the customer may require *consultation* to understand the situation in order to find a solution, which can be provided through advisory, training, counseling etc. When customer is happy with information and/or consultation received about the service the customer is ready for *ordering* the service. Again the ordering should be conveniently provided to the customer. After placing the order the customer can receive gestures of *hospitality*, *safekeeping* and *expectations* which are something extra added to the core service to gain customer satisfaction. Up to this point customer experience may have been promising but the *billing* comes in wrong time and is confusing. Customer is expecting that the correct and appropriate *payment* methods are provided.

Latter quick overview of supplementary services pointed out that when developing the core service the supporting functionalities must be considered carefully as well. In other words the flower of service also helps to perceive the functions and stakeholders within the organization that add value to the customer experience. In order to ensure that the core and complementary services are aligned the information flow between them must be guaranteed.

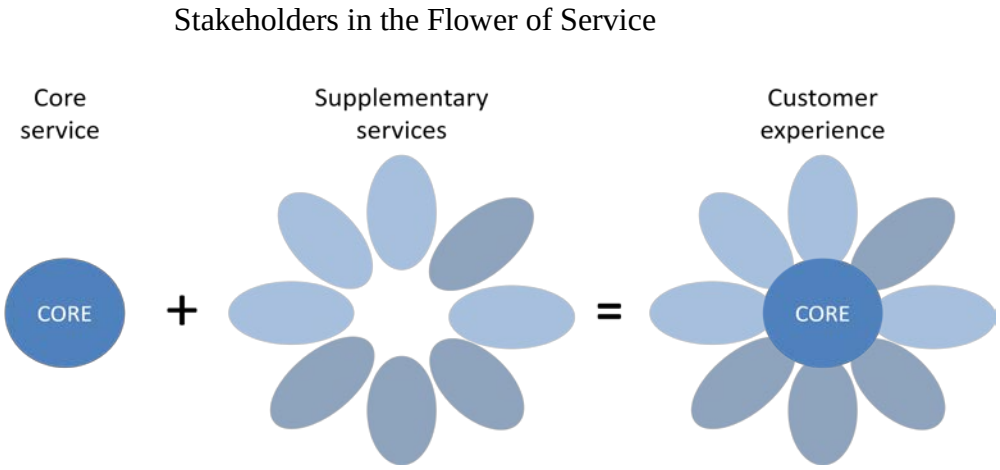

FIGURE 8. Information sharing among stakeholders visualized using the flower of service (adopted and modified from Lovelock, Vandermerve and Lewis 1996).

The flower of service can be exploited to the information sharing perspective by visualizing the roles of other functions and stakeholders in overall customer experience (see figure 8). When developing services understanding the customer requirements is essential, and in order to ensure overall customer satisfaction all pedals in the flower must share the same understanding and information about the service.

So far the chapter has discussed about organizational information sharing and communication from the service perspective by defining internal marketing and overall service delivery system. In other words the discussion has focused on arguing the importance for building an environment that encourages information sharing and for understanding the service as an overall customer experience. Next the discussion will be taken further to define the information sharing and communication in service and product development environment.

Service and product development is an information-intensive process where various activities produce and process the development information (Ulrich & Eppinger 2008, 13). There are different types of information that can be helpful in different phases during the development, especially in the early phase where variety

of information types are needed (Zahay et al. 2003, 11). Product and service innovations cannot be created without interaction and knowledge transfer between actors (Ståhle 2002,15). Development often requires cross-functional involvement which means that the interaction and communication is required across organizational boundaries. Therefore it is important to ensure the transparency among development stakeholders to create new knowledge (Brown 2000, 25). On the other hand too much information can also be harmful and that is why the information should be well targeted. The quality of information is also far more important than the amount. As Toyota would put it "one must know what to communicate and what not to communicate". (Morgan & Liker 2006, 261-262) Nonetheless information sharing and communication is not something that company should put effort on establishing rather it should be natural next step from proper information management (Milner 2000, 26).

3 RESEARCH APPROACH AND METHODS

This chapter outlines the empirical part of the thesis. In the beginning of the chapter the background for research subject and its evolvement is explained shortly. Then the research environment is introduced to reason the need for the research. And finally the execution of research methods is discussed.

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3.1 Research environment

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3.2 Research execution

To answer the research questions and present absorbing evidence about the phenomenon a requisite amount of data needs to be gathered (Yin 1984, 143). Therefore the empiric research is carried out by using a qualitative case study research method. The research method was chosen because the research phenomenon is complex and needs to be reasoned in surrounding context. Furthermore the case study method supports gaining iteratively in-depth understanding about the research object and allows usage of many different research tools (Gagnon 2010, 3; Swanborn 2010, 21; Yin 1984, 143).

To support the case study research formulation the literature of customer-oriented service development and managing organizational information was obtained. Literature supported the existing assumptions and provided different aspect and perspectives to approach the research phenomenon. Literature was not encompassing and required comprehensive review which in the end only added positive extra flavor to the understanding of the topic.

Conducting the research required active participation as the research environment is also a working environment. In order to gain the understanding of the phenomenon there was a demand for diving deep into organizational systems and interactions between actors. Before starting the actual research the phenomenon of information sharing between stakeholders in service development process was present in discussions but it seemed to be considered as a self-evident or an unreachable object. Starting to debate on the phenomenon was challenging for the researcher as for the research participants.

Data collection

Qualitative data collection methods were used to gain in-depth understanding of the case. The methods were chosen to be meaningful to the case study (Koskinen et al. 2005, 157). Data gathering was executed in parallel and in terms of supporting each other. Yin's (2003, 89-98) three principles for data gathering in a case study were used as guidance. Multiple data gathering methods were used and the chosen methods were observation, written material analysis and unstructured in-

terview. The data was stored centrally and is available for primary audience of the research. Chain of evidence is conducted to increase reliability. Reader should be able to follow the progress of the research from research questions to the conclusion. Next the execution of data gathering using different methods is discussed.

Observation

Qualitative observation stands for observing natural situation in different environments (Koskinen et al. 2005, 77). The meaning of an observation was dual: to identify and verify stakeholders in service development process, and investigate stakeholders' behavior and interactions in service development process. The observation was carried out throughout the empirical research but was more intense in the beginning. The plan was to actively participate to the meetings, hallway discussion, lunch-break and other interactions. The goal was to mainly gather information from stakeholders about the experiences of information sharing and communication in service development process.

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Written material analysis

In parallel to the observation written material relating to the service development process was searched, reviewed and analyzed. There are advantages and disadvantages in gathering documents and written material. Advantages are that it can be done by the researcher alone and it can be conducted relatively fast. Disadvantages are unreliability when interpreting unfamiliar documents, and documents that are not created for this particular research purpose. (Järvinen & Järvinen 1996, 111)

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Unstructured interview

The advantage of unstructured interview is its informality. The interviewee is the one who leads the interview and even form the questions, and researcher role is to understand the perceptions and views of interviewee regarding to the discussed

topic. Disadvantages of unstructured interview are: its questionable reliability why other methods are suggested to be used together and its time consuming nature. (Koskinen et al. 2005, 104-106).

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The plan was to have a discussion about the interviewees', the stakeholders, information requirements in service development process and gain understanding of the level of current information sharing but also identify barriers. Many times the unstructured interview and observation became as the same method. The observed situation led to the one-on-one discussion where the questions were formed together.

4 RESEARCH EXECUTION AND FINDINGS

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4.1 Observation

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4.1.1 Meetings

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4.1.2 Open discussion

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4.1.3 Findings

The content is not available

4.2 Written material analysis

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4.2.1 Service development process description evaluation

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4.2.2 Process walk-through analysis

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4.2.3 Findings

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4.3 Unstructured interviews and findings

The content is not available

5 CONCLUSIONS

The focus of this chapter is to summarize the research by revising the research objective, the research questions, and the chosen research methodology and data collection methods. Then the research findings are critically discussed and evaluated by comparing towards the targets set for the research. Finally the research conclusions and recommendations for improvement in the case company as well as for further research are presented.

The objective of this research was to discover the means to improve the information flow within the service development process in order to enhance the information sharing and communication between the stakeholders. In order to reach the objective the current state of information sharing and communication between the stakeholders in the service development process was evaluated. To support the main research question the stakeholders and their information requirements were identified, as well as the information flow aspect in service development process documentation.

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6 APPENDICES

Appendix 1. *Process evaluation form.* (Source: LUAS/Marja-Leena Savonen)
Evaluation form is used in written material analysis to evaluate the information perpective in case company's process descritption.

Appendix 2. *Process explanation page* (Source: LUAS/Marja-Leena Savonen)
The text in written material analysis, findings and conclusions refers to the Process explanation page.

Appendix 3. *Process walk-through content* (Source: The case company)
The process walk-through reports are analyzed as part of the written material analysis.

Appendix 1.

EVALUATION FORM

1. The name and the owner of the process	
2. Evaluate process objectives Have the following issues been taken into account in the process: - Strategy requirements? - Official requirements? - Customer needs?	
3. Evaluate process description (process card, process flowchart, process explanation page) - Does the activity match the description, have the critical points been correctly defined? - Are there enough instructions for each process step? - Do IT-systems support the realization of each process step?	
4. Evaluate process indicator metrics - Are correct issues measured? - Are the process metrics integrated with the process objectives and success factors? - Do the selected indicators give information whether there has been success from the point of view of the customer, own personnel, process performance or economy?	

5. Evaluate the process resource requirements: - Personnel - Equipment and machinery - Systems, software	
6. Evaluate process ownership and other actors? - Are they correctly identified? - Are authority and responsibility definitions clear? - Are authority and responsibility definitions documented?	
7. Evaluate process output information, documents and their utilization	
8. Evaluate process steering, evaluation and improvement procedures	

Summary

Strengths	Weaknesses
Opportunities	Threats

Appendix 2.

Process explanation page

Explanation page for each process step

Step/activity **in the order that the arrows in the process flow chart show**	**Who**	**Critical factors** **is there something that can go wrong in this step?**	**Methods, work in-structions, tools, IS-programs etc. Possible control and surveillance point?**	**Input information** **What information is needed to fullfill the step**	**Output information** **What information comes out of this step**

Appendix 3.

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