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VALUE PROPOSITIONS TO JUSTIFY VALUE CAPTURE FROM  
DIFFERENT STAKEHOLDERS

Master of Science Thesis

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## ABSTRACT

**TATIANA PULKKINEN:** Value propositions to justify value capture from different stakeholders

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Digital innovations provide organizations with ways to better serve their customers and reduce costs through improved operational efficiency and effectiveness. Today, ICT systems are widely used in the healthcare industry all around the world. However, the motivations and needs of the various stakeholders involved are disparate. This imposes challenges to ICT providers aiming to develop profitable revenue models which capture value from the stakeholders benefited from the company offerings.

The objective of this study is to discuss the role of value propositions as tools to communicate and demonstrate the value of the offerings to different stakeholders, with the objective of justifying value capture. Developing value propositions customized to target specific stakeholder groups was studied as a strategy to sustain value capture from stakeholders benefiting simultaneously from an offering.

Based on the study, it seems to be of great importance to be familiar with the particularities of the industry and the motivations and most critical needs of the target stakeholders. Value propositions are more attractive if they are customized to each target stakeholder group and more effective if economic value is clearly stated and can be demonstrated in short pilot projects. Value propositions built in that way prove to be powerful tools to justify value appropriation from different stakeholders.

## PREFACE

This thesis describes how value propositions can be used to justify value capture from different stakeholders, and highlights the importance of considering different stakeholders' needs when developing such value propositions. The value proposition helps stakeholders to understand the value a new product or service delivers to their organizations, constituting an excellent tool to sustain value capture from various revenue sources. The research was conducted for a Finnish healthcare IT company.

This research has been very fruitful for me to understand the complexity involved in business development with public organizations. As a researcher, it has been possible for me to analyze different stakeholders and their points of view about IT products and services in the public healthcare setup. Specially, motivations and barriers existent in such unique business environment.

I am thankful to the case company representatives for allowing me to perform this study. I am thankful for the interesting discussions, their open mind and all the support and input they provided during the research process. I would also like to thank Dr. Jouni Lyly-Yrjänäinen for his feedback and guidance through the process of writing this thesis. Finally, special mention to my family for their support and patience through all my studying time.

Pirkkala, 19.9.2017

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## LIST OF SYMBOLS AND ABBREVIATIONS

APR	Avohoidon potilasryhmitys (Outpatient treatment patient groups)
B2C	Business to Consumer
B2B	Business to Business
CRM	Customer Relationship Management
DRG	Diagnosis-related groups
EHR	Electronic Health Record
EVP	Exclusive Value Premium
GE	General Electrics
ICT	Information and Communications Technology
ITU	International Telecommunication Union
IP	Intellectual Property
KELA	Kansaneläkelaitos (Finnish Social Insurance Institution)
NGMN	Next Generation Mobile Networks
NHI	National Health Insurance
OEM	Original Equipment Manufacturer
PC	Personal Computer
pDRG	Perus DRG (Primary care DRG)
R&D	Research and Development
SaaS	Software-as-a-Service
SMT	Sosiaali- ja terveystieteiden ministeriö (Ministry of Social Affairs and Health)
TCE	Transaction Cost Economics
USP	Unique Selling Proposition



# 1. INTRODUCTION

## 1.1 Background

The public healthcare system of many developed countries is constantly under huge pressure (Myllärniemi & Helander 2012). Due to the increasing amount of aging population (Härkönen et al. 2010) and the increment of chronic disease cases, the already high healthcare costs continue to increase year by year (Kujala et al. 2006; Finnish National Institute for Health and Welfare 2016). However, governments stress the need to implement cost reduction strategies (Myllärniemi & Helander 2012; Teperi et al. 2009). On the other hand, the quality of the healthcare services, including the both service availability and success, need to be still developed to maximize the value delivered to the citizens. Indeed, both cost reductions strategies and service quality improvement should be developed hand in hand in the healthcare sector. Otherwise, the effect of focusing only on reducing costs in the short-term brings the opposite effect on the long-term (Teperi et al. 2009). One way to improve quality and reduce costs at the same time is to embrace a digital strategy consisting on healthcare ICT systems and innovations aiming to increase efficiency and effectiveness.

Digital solutions and information and communication technology (ICT) innovations enable enhancements in productivity, performance, efficiency, customer communication and satisfaction, promotes innovativeness, reduces communication costs and facilitates the delivery of remote services. Among other industries, healthcare has already profited extensively thanks to the development of ICT (Viitanen et al. 2011). It is estimated that ICT helps offering healthcare that is safer, more responsive to patients' needs, and at the same time more efficient (Hyppönen et al. 2014). Today, large amounts of ICT systems are used in healthcare organizations to assist physicians and other healthcare professionals in their daily work with patients (Viitanen et al., 2011; Hyppönen et al. 2014).

However, the different organizations in which healthcare systems are divided have own internal interests and objectives, plus quite tight budgets for their operations. At the same time, uncertainty whether investments in ICT will result in actual measurable cost reductions result in the situation where healthcare managers perceive those investments more as expenses. The rapid proliferation of technological startups offering a variety of products and services that promise to boost their customers' organizations efficiency and effectiveness has lately contributed to the increase of competitiveness in the sector. As a result, customer have become more demanding than ever, especially when it comes to the point of evaluating suppliers' offerings and deciding which investments are more likely to break even while making the organization more competitive at the same time.

## 1.2 Objective

When considering whether to make a purchase or investment, customers estimate the benefits they will receive in comparison to the sacrifices they have to make. Only if the difference between the benefits and the sacrifices is attractive enough, the potential client will be interested in the supplier's offering. In other words, if the value offered reaches potential customer's expectations, there are great chances to get successful sales.

However, to deliver value to their customers, firms need to cover their own costs, without forgetting to make profit for the owners. But business networks where firms operate can be very complex, with several different types of stakeholders participating in the network value creation and capture. Therefore, it is of interest of firms operating in such value networks to be aware of the different stakeholders and how they can influence their businesses. Especially, to fulfil their value capture objectives within the network, firms need to carefully analyze which are the different stakeholders who benefit from the firm's activities and offerings. Resonating focus value propositions that target the most critical needs of each stakeholder benefiting from the firm's offerings should be craft, as they can be used to justify the value capture from those stakeholders. The firm's financial health depends on its ability to implement a revenue model which assures appropriate value capture for the firm as compensation for the value it delivers to other stakeholders. Therefore, the objective of this thesis is ...

*... to analyze the role of value propositions as a tool to justify value capture from different stakeholders benefiting simultaneously from a firm's products and services.*

To achieve this objective, this thesis presents an overview of the concepts relevant for this study: value proposition and revenue model. After that, a review of stakeholder theory is presented, and a framework to justify value capture from different stakeholders is designed, by using the building blocks resulting from the literature review. Finally, the framework is applied to the case company under study.

## 1.3 Research Methods and Research Process

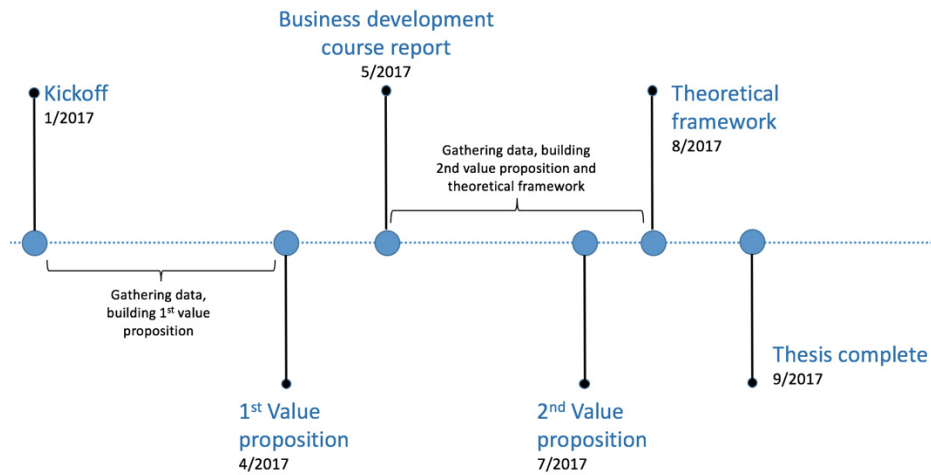
Case studies and field research are tools to obtain richer understanding and knowledge about specific research topic. Case study can be defined as an empirical inquiry that explores a contemporary phenomenon within its real-life context (Yin 2014). Case studies are most beneficial when the phenomenon under study is complex, the theoretical base is thin, the phenomenon is difficult to study outside its natural environment, or the different variables related to the phenomenon are not well-known (Suomala & Lyly-Yrjänäinen, 2012).

In case study research, qualitative methods, quantitative methods or a combination of both can be used for data generation. According to Gummesson (1993), there are five qualitative data gathering methods for managerial research.

- Existing material
- Questionnaire surveys
- Qualitative interviews
- Observation
- Action science

Existing material, also known as secondary data, includes books, research reports, articles, notes, databases, photos, films and so on, which were created for somebody else's purpose. Existing material constitutes an easy starting point for researchers, and it can be used alone or to complement other methods. Questionnaires are used to formalize and standardize interviews. Depending on the structure, questionnaires can be formal or informal, and depending on the contact with respondents, questionnaires can be personal, semi-personal (via telephone) or non-personal (via mail). Qualitative interviews are the most common data generation method in case study research. Compared to formal interviews, qualitative interviews are more informal and closer to a conversation, and at the same time are systematic. Observation requires the researcher to use of all senses. There are two types of observation: participant observation and direct observation. Participant observation requires personal involvement of the researcher. On the other hand, in direct observation the researcher can merely observe the process under study without being involved. In action science, researchers become active participants influencing the process under study. One concept closely related to action science is the concept of interventionist research. According to Suomala & Lyly-Yrjänäinen (2012), interventionist research requires deep and active involvement of the researcher with the object of study.

The research for this thesis started in January 2017, when the author started working with the case company in a project related to the course "Business Development in Sales and Sourcing". The most important milestones of the research process are shown in the Figure 1.



*Figure 1. Research process.*

The objective of the course project was to analyze how to develop value propositions to effectively communicate the customer value of digital solutions to healthcare customers. Working in the project gave the author the opportunity to learn and test the products and services offered by the case company, as well as get insights about the healthcare processes the case company products aims to support and improve. Several visits to the case company took place during the Spring of 2017, where the author had the chance to discuss business development related issues with the case company CEO and managers.

During the first steps, the researcher learnt about the case company situation and its short and long term milestones, through observation, existing material (e.g. brochures, company web site, sales material and other internal documents) and several informal qualitative meetings with the company CEO and managers. During February and March 2017, a theoretical framework on how to craft value propositions was developed, and then was used to analyzed the case. The project was concluded in May 2017, when the findings were presented to the case company representatives and the report for “Business Development in Sales and Sourcing” course was concluded.

In April 2017, during a qualitative interview with the case company representatives, it was realized that investigating about the different possible revenue models and possibilities for value capture could be an interested topic for a Master thesis, especially to analyze how to justify value capture (i.e. revenue streams) from different stakeholders benefiting from the case company’s products.

During June and July of 2017, by using existing material such as journals and documentation from Finnish Welfare and Healthcare authorities and development associations, data about healthcare stakeholders and industry characteristics was gathered to support the development of the theoretical framework and recommendations concerning the value proposition. Next, the theoretical framework was developed.

In August 2017, the value proposition was developed, the case study was analyzed based

on the framework and the empirical data gathered. The author attended a case company sales presentation at a public Finnish hospital, from where through observation, the author could presence and confirm some of the characteristics of public healthcare organizations mentioned by different journals, specially regarding healthcare professionals' behavior towards IT in general. The author also attended a session of the Tampere Executive MBA in Welfare and Healthcare, where the case company was used as an example of innovation that brings value to different stakeholders. Qualitative data was gathered from brainstorming with managers of different healthcare centers, hospitals and healthcare foundations.

## 2. VALUE PROPOSITION

### 2.1 Definition of Customer Value

In the dynamic and highly competitive business environments where firms operate, to be profitable and ensure continuity, it is not enough for firms to offer products or services that are somehow useful for their customers. Due to global competition, slow-growth economies and more demanding customers, organizations are looking for new sources of competitive advantage (Woodruff 1997; Martelo et al. 2011). In this context, the importance of the concept of customer value has raised in the last decades (Smith & Colgate 2007), and it has partially replaced more limited concepts such as quality or customer satisfaction, which have been discussed in the literature before (Martelo et al. 2011).

Customer value is considered by many researchers and practitioners an important source of superior and sustainable competitive advantage (Woodruff 1997; Parasuram 1997; Graf & Maas 2008). Understanding the way customers judge and value company offerings (Graf & Maas 2008), creating value for them and managing it over time have long being recognized as essential elements of business strategy (Martelo et al. 2011).

Customer value is a key strategic concept influencing companies' success (Woodruff 1997; Huber et al. 2001; Graf & Maas 2008). Customer value can be seen as the key to making profit. Customers purchase products and services that they perceive as being more valuable than the actual costs they have to incur to get them (Khalifa 2004; Anderson et al. 2008). In other words, customers are willing to make sacrifices in exchange of expected benefits that outweigh the total sacrifices. According to Van Rensburg (2012), customer value is the "sine qua non" of business, which needs to be constantly created, nurtured, executed, and appreciated to avoid the firm to be in disadvantage respect to competitors, which would result in an erosion of wealth and shareholder value.

The idea behind the concept of customer value is to understand the offerings' benefits and features from the organization's customers' point of view, considering what customers want and what they believe they obtain if they make the purchase or investment. It is important to notice that customer value is determined by customer's perceptions, not by suppliers' assumptions or intentions. As Khalifa (2004) puts it, customer value is "not what the producer puts in, but what the customer gets out".

According to Zeithaml (1988), customer value can be defined as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given", thus value is subjective and perceived by the customer, and it will be experienced differently by different customers, depending on factors such as demographics, financial status, social factors or believes, which change over time (Parasuraman 1997;

Huber et al. 2001). For example, when choosing from which supermarket to buy groceries, some customers will prefer to find the most economic option and achieve the most value for their money, while other customers will value more time and effort and will opt for a supermarket close by their home, despite of the higher prices.

Evidence supports that customer value is not perceived in the same way in different contexts (Woodruff 1997). When making a purchase decision, customers compare the different alternatives and evaluate which is the most convenient, in many cases without testing the products. In contrast, when evaluating a product during or after usage, customers focus on the product performance in different use situations. Thoughts about product features play a more important role during the purchase, whereas performance is more relevant during or after use. This explains why customers perceive value differently at the time of purchase than they do during and after use.

The definitions above consider the concept of customer value from a more static, value in use or value in exchange perspectives. Woodruff (1997) introduced a broader definition of customer value that considers both the customer's desired and received value. He states that customer value is "a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations". Although this definition reflects the complexity of the concept, it simplifies the context to usage situations, which solves the ambiguity of other definitions respect to the context in which value is being evaluated. Regarding the differentiation between customer expected or desired value and customer perceived or received value, various authors support the fact that the key to company success is to create more value than competitors and at the same time maintaining a balance between expected and perceived value (Huber et al. 2001; Voss et al. 1998).

The value perceived by customers is usually subjective (Anderson et al. 2008; Zeithaml 1988) and because of that, it is difficult to evaluate. Lanning (1998) affirmed that the value that makes a difference is the one experienced by the customer. He sees the customer's resulting experience as the essence of the value proposition, and value as the price the customer is willing to pay. (Khalifa, 2004) This is often the case in B2B relationships where customer value is realized and experienced in-use and over a long period of time. In this case, intangible value components related to the value of the buyer-seller relationship need to be considered (Keränen & Jalkala, 2013). Intangible value components are also of great importance in consumer markets. In B2C, customers buying decisions are affected not only by the economic or utility component of value but also by the perceived corporate, social and environmental reputation of the company offering the product, brand or service (Van Rensburg 2012). Thus, customer value is not static and cannot be always modeled by focusing only on the economic consequences of purchasing an object of exchange (Keränen & Jalkala, 2013; Martinsuo et al., 2016).



## 2.2 Customer Value Models and Frameworks

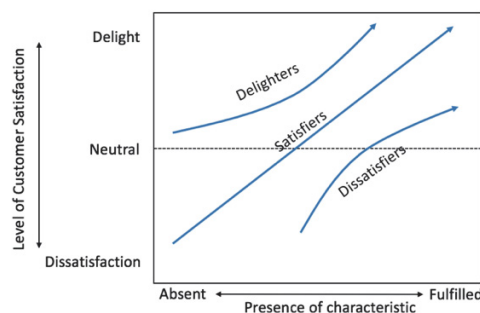
There are different customer value models and frameworks classifications according to different authors. Most used customer value models and frameworks categories are presented in Table 1.

**Table 1.** *Customer value models and frameworks classification.*

Category	Authors
<ul style="list-style-type: none"> <li>Value component models</li> <li>Means-ends models</li> <li>Benefits/costs ratio models</li> </ul>	Khalifa (2004) Aluchna & Idowu (2017)
<ul style="list-style-type: none"> <li>Multi-dimensional models</li> </ul>	Aluchna & Idowu (2017)

Value component models describe customer value as consisting of different value components, and focus on customer's benefits. However, value component models ignore the sacrifices incurred by the customer, as well as the customer activity life cycle and the interaction between customers and suppliers. Kaufman's and Kano's models belong to this type.

Kaufman's model distinguishes three value elements: esteem value or "want", exchange value or "worth" and utility value or "need". In his model, Kano recognizes three components of value: dissatisfiers, satisfiers, and delighters, as shown in Figure 2. (Khalifa, 2004)

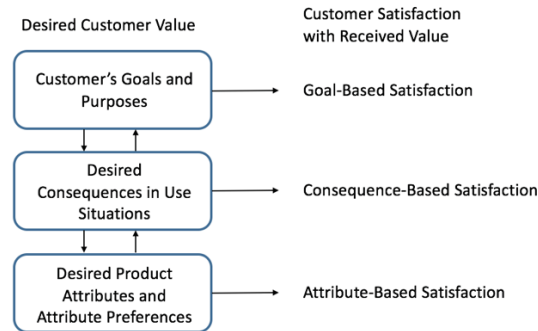


**Figure 2.** *Kano's customer value model.*

Dissatisfiers are must-have attributes, taken for granted when fulfilled, thus causing disappointment if not. Satisfiers are expected and explicitly requested by customers. Customers are disappointed if these needs are poorly met and have increasing satisfaction the better these needs are met. Finally, delighters innovatively solve a latent need of the customer, and since they are unexpected, there is no negative effect if they are absent.



Means-ends models assume that customers acquire and use products or services facilitate the achievement of specific customers' needs and/or goals (Khalifa 2004; Huber et al. 2001). Means-ends models focus on the relation between product attributes (means), consequences produced through consumption (service-means), and customers' personal values (ends or goals) (Aluchna & Idowu 2017, p. 62). Woodruff (1997) proposes a means-end customer value hierarchy model, presented in Figure 3.



*Figure 3. Customer value hierarchy model (based on Woodruff, 1997).*

Starting at the bottom of the hierarchy, customers think of products as bundles of attributes and performances. During purchase and use situations, customers form preferences for certain attributes according to those attributes capabilities to help customers achieve the desired consequences at the middle level of the hierarchy. Finally, customers learn to desire consequences that facilitate them to achieve the goals and purposes at the top level of the hierarchy. Moving down the hierarchy, customers use goals and purposes to attach importance to consequences, and important consequences guide customers when forming preferences of attributes and attribute performances (Khalifa, 2004).

Means-ends models successfully explain why customers assign different weights to various benefits, taking also into account negative consequences derived from products' attributes. However, means-ends models do not pay much attention to the sacrifices customers have to make in exchange for the benefits obtained. (Khalifa 2004; Aluchna & Idowu 2017, p. 62)

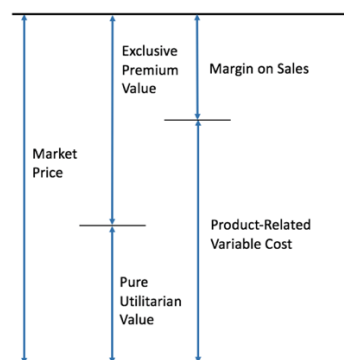
Customer value multi-dimensional models combine traditional functional dimensions such as perceived price, quality, benefits and risks with socio-psychological dimensions, such as prestige, social interaction, novelty and hedonism (Aluchna & Idowu 2017, p. 63). Nevertheless, similarly to previous types, multi-dimensional models fail to consider customer costs.

Sheth et al. (1991) identify five consumption values which influence consumer choice behaviour: functional, social, emotional, epistemic, and conditional. Functional value results from products' ability to perform its functional, utilitarian or physical purposes. Social value derives from the product's image and symbolism in relation with demographic, socioeconomic, and cultural-ethnic referent groups. Emotional value is originated by

products' ability to generate feelings or affective states. Epistemic value refers to products' ability to generate curiosity, provide novelty and desire for knowledge. Finally, conditional value refers to the value originated by products in specific situations or contexts. (Smith & Colgate, 2007)

Holbrook (1996) defines customer value as an “interactive relativistic preference experience”, and argues that there are eight customer value types divided into four categories: Economic (efficiency, excellence), Hedonistic (play, aesthetics), Social (esteem, status) and Altruistic (ethics, spirituality). Efficiency results from the use of a product to achieve some self-oriented goal. Excellence relates to the quality and satisfaction that the product use brings to the customer. Play refers to the feeling of joy and fun the customer may experience when using a product. Aesthetics is concerned with the product's appearance and design. Esteem results from the ownership of possessions as a means to building one's reputation. Status denotes the use of own consumption behavior to achieve a favorable response from someone else. Ethics refers to benefits that aim at achieving justice, virtue or morality. Finally, spiritual benefits are those delivering faith, ecstasy and sacredness.

Benefits/costs ratio models, also known as utilitarian models, define customer perceived value as the difference between the benefits received and the sacrifices or costs incurred (Khalifa 2004). Treacy and Wiersima (1995) define customer value as the sum of the benefits received minus the costs incurred by the customer in order to acquire the product. Further, they state that benefits directly improve the customer's experience, while costs can be tangible or intangible, and include price, maintenance costs, plus the time spent on delays, errors and effort. Groth (1994) argues that consumers make purchases for other than just pure utilitarian reasons. He introduces the concept of exclusive value premium (EVP) and proposes that customer value consists of pure utilitarian value and exclusive value premium, as Figure 4 illustrates.



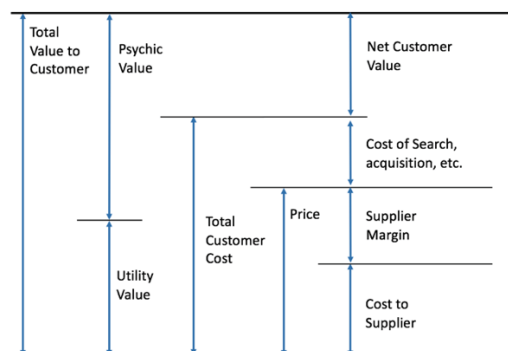
**Figure 4.** Groth's customer value model (adapted from Groth, 1994).

EVP comprises premiums above pure utilitarian value. EVP depends on psychic factors, which can be internal or external to the individual, and in turn, can be real or perceived. (Groth, 1994)

Horovitz (2000) states that customers obtain value when the benefits of an offering exceed its costs of acquisition and usage. In his model, he argues that benefits can be improved, extended, and expanded. To improve a benefit, companies need to focus on one or few attributes and improve them respect to current range. To extend benefits, companies need to add auxiliary services related to their products in order to create more complete solutions to their customers. Finally, to expand a benefit companies have to add intangible features to their offerings in ways that make them reach the level of experience. Concerning the costs, Horovitz (2000) pays attention to the total costs of ownership of a product, such as price, acquisition and usage costs and effort.

Huber et al. (2010) recognize benefits and costs defined in terms of customer's perceptions, during the whole customer's activity life cycle, including acquisition, consumption (use), and maintenance. During purchase situations, customers tend to apply cost-benefits principles to evaluate and compare different offerings, and because of that, they might pay more attention to the associated costs. The cost of a purchase considered by consumers includes monetary costs, time costs, search costs, learning costs, emotional costs, and, cognitive and physical effort, combined with financial, social, and psychological risks caused by the uncertainty and potential negative consequences of consumer activities (Huber et al. 2010).

In the 2000s some authors (Khalifa 2004; Kotler & Keller 2008, p. 121; Lyly-Yrjänäinen et al. 2010; Suomala et al. 2011) have popularized the concepts of total customer value and total customer cost. According to Khalifa (2004), the difference between total customer value and total customer cost results in the net customer value, as presented in Figure 5.

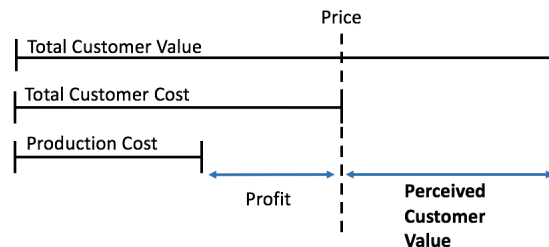


**Figure 5.** Net customer value (adapted from Khalifa, 2004).

The total benefits (or total value to customer) consists of utility value and psychic value. On the other hand, the total customer sacrifices (or total customer cost) is composed of financial and non-financial customer costs components, which together form the total customer ownership cost.

Lyly-Yrjänäinen et al. (2010) define total customer value as the monetary value of all the benefits (economic, functional and psychological) provided by a product. Naturally, those

benefits do not come for free. Instead, to obtain that value, customers have to incurred in costs. Total customer cost is the sum of all those costs, including purchase costs, usage costs and disposal costs. In this context, Lyly-Yrjänäinen et al. (2010) argue that customer perceived value is the difference between total customer value and total customer cost, as illustrated in Figure 6.



**Figure 6.** Customer's perceived value, price and profit (adapted from Lyly-Yrjänäinen et al. 2010; Suomala et al. 2011, p. 319).

Customer perceived value is the actual value that a company provides to its customers through products or services, and as such it can be seen as the incentive for the customer to purchase the product. As illustrated in the figure above, to successfully attract customers, the product price should be set somewhere between the total customer value and the production cost, in a way that the incentive to the customer is appealing and the company can make profit at the same time.

A similar definition of customer value for B2B markets was inked by Anderson, Dipak, Chintagunta and Pradeep in 1992 (Kelly et al. 2017, p. 7). They defined customer value in business markets as “the perceived worth in monetary units of the set of economic, technical, service and social benefits received by a customer firm in exchange for the price paid for a product, taking into consideration the available suppliers’ offerings and prices”. Companies can increase the value offered to their customers by some combination of raising economic, functional, or emotional benefits and/or reducing one or more of the various types of costs (Kotler & Keller 2008). Quantifying and estimating customer value in B2C markets is not a simple task since benefits provided to consumers are in many cases related to psychological, social and emotional factors (Anderson et al. 2008). Lyly-Yrjänäinen et al. (2010) claim that, in B2B environments, it is easier to estimate benefits because of two reasons. First, in B2B is usually easier to quantify cost savings, and second, it is possible to estimate the income generated from the sales influenced by a particular product.

In B2B environments it is important to keep in mind the dynamic nature of value (Kelly et al. 2017, p. 18). The circumstances customers find themselves in are always changing: what is regarded as valuable today may not be that valuable tomorrow. Moreover, value also varies by customer, even within the same sector.

## 2.3 Value Proposition

In the dynamic and highly competitive business environments where firms operate, to be profitable and ensure continuity, it is not enough for firms to offer products or services that are somehow useful for their customers. Instead, firms must deliver significant value to their customers. To do that, it is necessary to understand the customer point of view, translate product and service features into customer benefits, solve real customer problems and provide with enough value so that customer investments can be justified. At the same time, sufficient degree of differentiation respect to competitors and new entrants needs to be achieved. Whether the offerings live up to expectation affects customer satisfaction and the probability that the customer will purchase the product again (Kotler & Keller 2008) or consider competitors' products. Therefore, communicating customer value in an effective and efficient manner is of great importance. In this context appears the concept of value proposition.

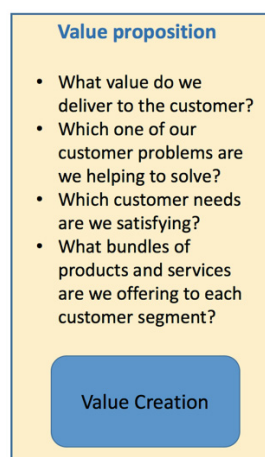
The term value proposition has its origins in the 1950s, as a result of the evolution of the concept of unique selling proposition (USP) (Kelly et al. 2017, p. 28). USP led to the benefit-led selling movement in which sales professionals were trained to describe customer benefits instead of product features. Today value proposition has become one of the most widely used terms in business markets (Anderson et al. 2008, p. 159), and the importance of developing superior value propositions have been highlighted as a key research priority (Patala et al. 2016). Despite the its growing use, there is little consensus about what a value proposition consists of or what makes one persuasive (Anderson et al. 2008, p. 159).

According to Lanning and Michaels (1988), a business is a system for superior value delivery: choosing a superior value proposition and echoing it through the business system by providing and communicating it to customers. Thus, essentially, the value proposition reflects the firm's core strategy (Patala et al. 2016). Value proposition can be understood as the specific messages that a company uses to communicate the customer value of their offering to their current and potential clients. The following table collects definitions of value proposition by different authors.

**Table 2.** *Value proposition definitions.*

Definition	Author
Statement of benefits being offered to a customer group at a price they were willing to pay.	Lanning and Michaels (1988)
Suggestions and projections of what impact on their practices customers can expect. When such a projection is proposed actively to customers, it is a promise about potential future value creation.	Grönroos and Ravald (2011)
Overall view of a firm's bundle of products and services that together represent value for a specific target customer segment.	Osterwalder & Pigneur (2004)
Clear and concise series of realistic statements based on an analysis and quantified review of the benefits, costs, risks, and value that can be delivered to stakeholders.	Van Grinsven (2010, p. 135)
A promise of expected future value, illustrating how that future relevant and distinct benefits will outweigh the total costs of ownership.	Kelly et al. (2017, p. 30)

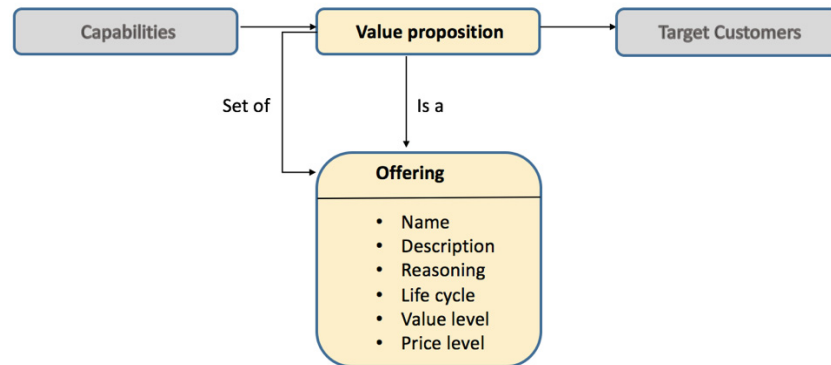
The value proposition is one of the components of business models, whose main goal is to ensure that company products create and deliver superior customer value to its customers. To do that, a value proposition must answer the questions shown in the figure below (Osterwalder et al. 2010).

**Figure 7.** *Value proposition goals (based on Osterwalder et al. 2010).*

By answering to those questions, a value proposition makes sure that a company's offering delivers superior value to its customers, solves customers' most critical problems and satisfies customers' most important needs. All that delivering customer benefits through

the products features, being those strategically grouped together into bundles of products and services which conform the specific offerings.

Osterwalder & Pigneur (2004) argue that value propositions are based on the firm's capabilities. Their value proposition model is illustrated in the Figure 8.



**Figure 8.** Value proposition (based on Osterwalder & Pigneur 2004).

As shown in the figure above, value propositions are composed of a set of one or more offerings. Offerings illustrate a specific product, service, or even product or service feature, and outline its assumed value to the customer. Offerings are characterized by a set of properties which are presented in the table below.

**Table 3.** Offering properties (based on Osterwalder & Pigneur 2004).

Property	Definition
Description	Explains what is the offering about
Reasoning	Why supplier thinks the offering could be valuable to the customer
Life cycle	Stage when the offering creates value <ul style="list-style-type: none"> <li>• Creation, Appropriation, Consumption, Renewal, Transfer</li> </ul>
Value level	Offering's amount of value compared to that of competitor's products, measured using a qualitative scale <ul style="list-style-type: none"> <li>• Me-too value (commodities), Innovative imitation (pocket PC), Excellence (iPhone) or Innovation (microwave ovens)</li> </ul>
Price level	Compares the offering's price to the competitors' by using a qualitative scale. <ul style="list-style-type: none"> <li>• Free (online newspapers), Economy (RyanAir), Market (stocks), High-end (Ferrari)</li> </ul>



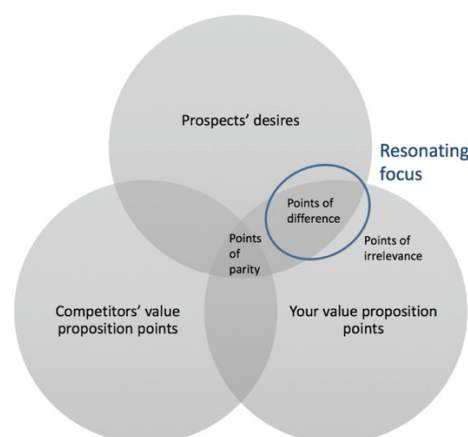
Most value proposition frameworks emphasize the importance of the customer, but do not pay attention to the possible risks. Van Grinsven (2010, p. 135) includes risk assessment in his framework, and argues that value propositions can be used to position value to the following stakeholder classes: (1) customers (both internal and external), (2) suppliers/strategic business partners, (3) employees, (4) regulators. Building value propositions to target the needs of various stakeholders will be further discussed in Chapter 4.

Anderson et al. (2008, p. 160) classify value propositions into three alternatives:

- All benefits
- Favorable points of difference
- Resonating focus

First, all benefits value proposition lists all the potential benefits that a specific offering might deliver to customers. This type of value proposition has a high risk of claiming advantages for features that provide no value to targeted customers. Furthermore, most of the benefits may be similar with those of competitors, diluting the effect of the few genuine points of difference. Second, favorable points of difference value propositions focus on differentiating the offering from the next best competitor alternative. Nevertheless, assuming that any favorable points of difference are valuable for the customer is not correct. Third, resonating focus value propositions make the offerings superior on the few elements that matter most to target customers, demonstrating and documenting the value of this superior performance, and communicating it in a way that conveys a sophisticated understanding of the customer's business priorities.

Anderson et al. (2008, p. 161) claim that resonating focus value propositions is the most successful value proposition alternative, used by best-practice suppliers. The figure below visualizes the resonating focus value proposition concept.



**Figure 9.** *Resonating focus value proposition.*

The advantage of resonating focus value propositions is that it does not get the customer confused within large lists of irrelevant benefits, very similar to those offered by other



suppliers. Instead, the idea is to emphasize the value of the points of difference, those benefits that are not covered by any other competitors' products, which make the offering stand out. How Van Grinsven (2010, p. 137) puts it, "it is not about telling the client what you offer, it is about why your offer is the best choice".

## 2.4 Developing Resonating Focus Value Propositions

When properly constructed and delivered, value propositions make a significant contribution to business performance and strategy (Anderson et al., 2006). Nevertheless, too often suppliers claim to be offering benefits it turns out they are not. On the other hand, the benefit of saving money for the customer has almost become a generic value proposition from prospective suppliers. (Anderson et al. 2008)

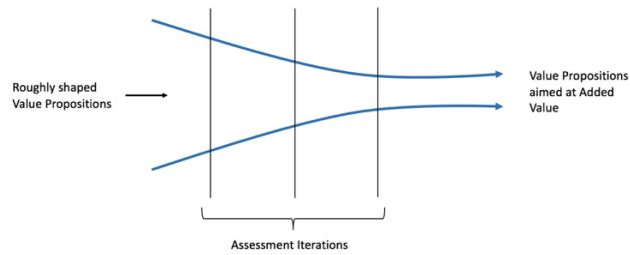
To craft a superior value proposition, usually it is necessary to have a deep understanding on customers' business and unique requirements to be able to tailor the offerings to satisfy most critical customer needs (Anderson et al., 2006). It is about learning to fully understand and decisively act on specific demands that customers and other influential stakeholders most value (Van Grinsven 2010, p. 137). More importantly, to make value propositions persuasive, it should be possible to quantify the provided value and demonstrate it to customers.

Van Grinsven (2010, p. 138) proposes a process of formulating value proposition composed of three phases:

- Understanding the benefits for the stakeholders
- Formulating the value proposition
- Delivering the value proposition

First, understanding the benefits for the stakeholders is a crucial phase. Usually, there are several different stakeholders, from who it is useful to identify the top beneficiary stakeholders. A good way to get knowledge about stakeholder benefits is to use semi-structured interviews or to experience the benefits yourself. As well, user-groups, reversed seminars, client meetings and client feedback are useful tools.

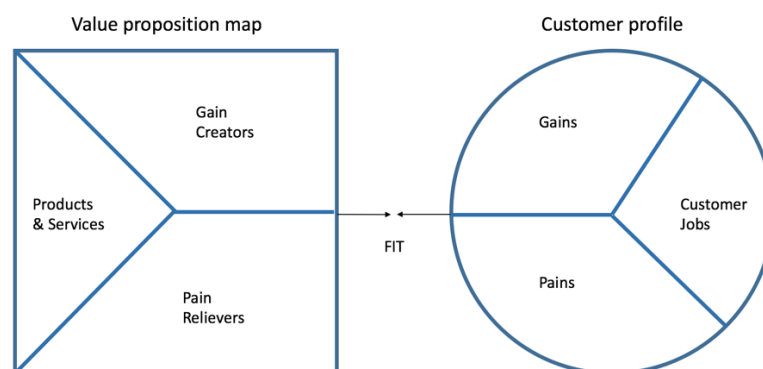
Second, the value proposition should be formulated in a clear, concise series of realistic statements, based on the quantifications of the benefits, costs, risks and value that can be delivered to stakeholders. Before delivering the value proposition, it should be assessed. This process helps to shape, re-shape and sharpen the value proposition, as Figure 10 shows.



**Figure 10.** *Value proposition assessment process (adapted from Van Grinsven 2010, p. 141).*

Finally, value propositions need to be delivered, and to do that, effective communication is crucial, not only to deliver the message, but also to persuade the stakeholders. It is important to know who the stakeholders are, be aware of their expectations and agenda's, understand how they measure those expectations, and understand what they try to accomplish, in order to satisfy their needs.

According to Strategyzer website, 72% of all new business ideas and innovations fail to deliver on expectations. With the intention to alleviate this problem, Osterwalder et al. (2015, pp. xvii) introduced the value proposition canvas, a tool to ease value proposition development. The value proposition canvas consists of two sides, the customer profile on the right, and the value proposition map on the left (Osterwalder et al. 2015, p. 3). The customer profile area is used to clarify the customer understanding, while the value proposition map is used to describe how the company intends to create value for that customer. When the one meets the other, fit is achieved. The value proposition canvas is shown in Figure 11.

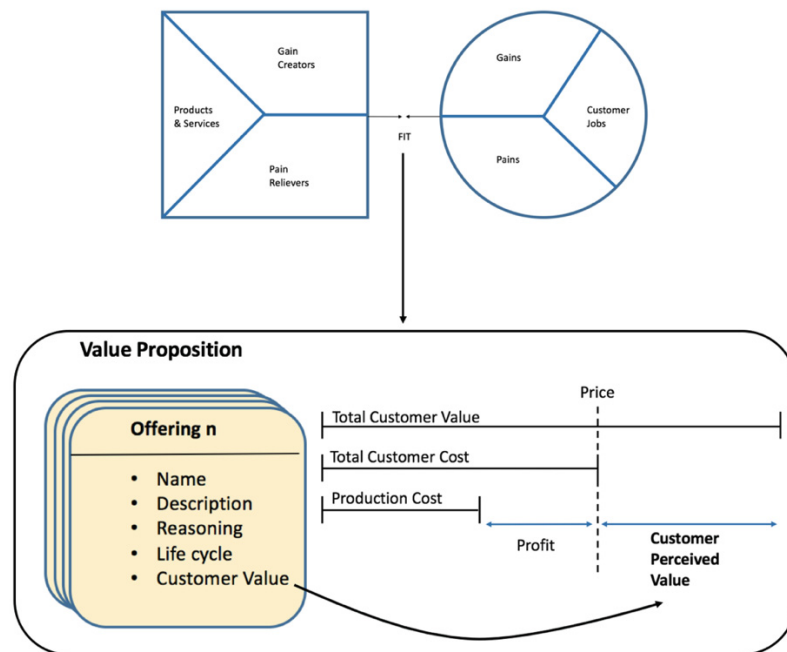


**Figure 11.** *Value proposition canvas (adapted from Strategyzer website).*

The customer profile describes a specific customer segment of the company in a more detailed and structured way, by dividing it into (1) customer jobs, (2) customer pains, and (3) customer gains. Customer jobs describe what customers are trying to achieve, expressed in their own words. Customer pains describe negative outcomes, risks, and obstacles related to customer jobs. Finally, customer gains describe the outcomes customers want to achieve or the concrete benefits they are seeking.

The value proposition map describes the features of a specific value proposition in a more structured and detailed way, by dividing it into (1) products and services, (2) pain relievers, and (3) gain creators. Products and services is a list of the offering a value proposition is built around. Pain relievers describe how the products and services alleviate customer pains. Finally, gain creators describe how the products and services create customer gains.

Fit is achieved by creating clear connection between what matters to customers, having product and service features to ease pain and create gains. Once fit is achieved with the elements from the Value Proposition canvas, those elements can be translated into the value proposition offerings and customer value can be demonstrated. The idea is visualized in the figure below.



**Figure 12.** Value proposition framework.

Most relevant sets of gain creators and pain relievers are organized around product and service features, which in turn are grouped into specific offerings. The customer value analysis is the core of each offering. Each offering has its own set of customer benefits and customer costs which determine how much customer value the offering would be delivering to the customer, as perceived by the customer himself. At the same time, the supplier must receive compensation for the work done, which should be greater than the costs of producing and delivering the offering to the customer. That way, the supplier ensures profitability of the business operations, making the business viable. These aspects determine the price level of each offering. Thus, in general, price must be attractive enough for the customer to decide to make the purchase and acceptably contribute to company profitability.

Summing up, resonating focus value propositions target essential customer job gains and pains and do so extremely well. However, outstanding value propositions can fail if the

business model is weak. Successful companies embed outstanding value propositions in scalable and profitable business models, which not only create superior value for the customers, but also include a formula to successfully capture a reasonable part of that value for the company. The revenue model is the component of the business model in charge of planning, developing and maintaining value capture mechanisms that aim to make companies profitable. Just as value proposition deals with value creation, revenue model deals with value capture. Because value creation and value capture are the most critical issues to be addressed by any business model, both value proposition and revenue model form the pillar on which every business model builds.

Next chapter presents a literature review on the concepts of revenue model and value capture, and a classification of revenue models. The link between value proposition and revenue model will also be discussed in the next chapter.

## 3. REVENUE MODELS AND VALUE CAPTURE

### 3.1 Revenue Model and Value Capture

The fact that a company possess a strong value proposition and is capable to successfully create and deliver value to its customers does not guarantee that the company will make profit or even be viable. A creative and thoughtful approach to value capture is a critical component of building a successful business model. The firm's value creation and delivery system must be designed with both the value proposition and value capture in mind (Richardson 2008).

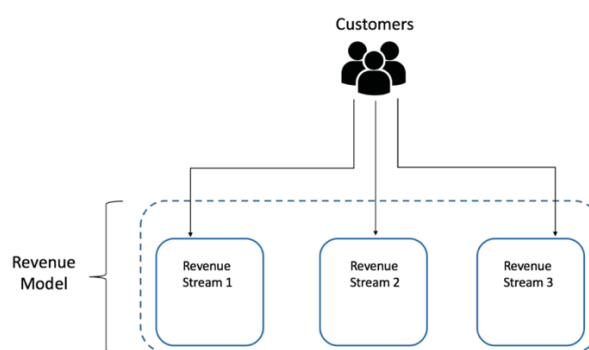
According to Richardson (2008), firms need to have a plan of how to produce revenue and provide for a profit margin over its costs, that is, a plan how to capture part of the value created by the business. He recognizes two elements, which combined explain how the firm makes money: the revenue model and the economic model. The economic model deals with costing, margins, and various financial aspects of the firm which are reflected in the operating cash flow statement. On the other hand, the revenue model describes the sources of revenue or different ways through which the firm receives money in exchange for its services, products or a combination of both. (Richardson 2008) The main objectives of revenue models are to define (1) which revenue streams to pursue, their volume and distribution, and (2) what value to offer, how to price it and who pays for it (DaSilva & Trkman 2014; Afuah 2004, p. 68).

Amit & Zott (2001) define revenue model as “the specific modes in which a business model enables revenue generation”. They argue that business models and revenue models complement each other. Business model refers primarily to value creation whereas revenue model is concerned with value appropriation (Amit & Zott 2001), how revenue is appropriated by the firm through the sale of its products. It is related to the ways by which companies get income to sustain their operations and achieve profit, thus making the business viable (Ojala 2013). Seen from another angle, a revenue model defines how a firm is compensated by its customers for the goods or services delivered, usually but not necessarily through a monetary compensation (Popp 2011b). Afuah (2004, p. 68) sees revenue models as “frameworks for generating revenues”, and includes pricing as a revenue model component.

Revenue models are important because of two reasons (Afuah 2004, p. 67). First, by understanding its market's sources of revenue, and especially the profitability of each source, a firm can make better choices about which activities to perform, how to perform them, and when to perform them to increase its chances of being profitable. Second, by knowing its possible sources of revenue, a firm is in a better position to understand the threats a technological change can pose. Thus, planning and developing a competitive

revenue model is crucial for firms to efficiently obtain revenue in exchange for the value provided to customers, to be able to cover the costs of their operations and ensuring business continuity.

Osterwalder & Pigneur (2010) state that revenue models consist of one or more revenue streams. According to Popp (2011a, p. 49), revenue models made up of several revenue streams are hybrid revenue models. Suppliers tend to exploit more than one revenue streams. The idea is to consider alternative means of exchange that customers will find attractive (Richardson 2008), and deploying a well-thought revenue stream configuration that better reaches customers with various needs, and that way achieve larger market share and sales. Figure 13 visualizes this idea.



**Figure 13.** *Revenue stream configuration.*

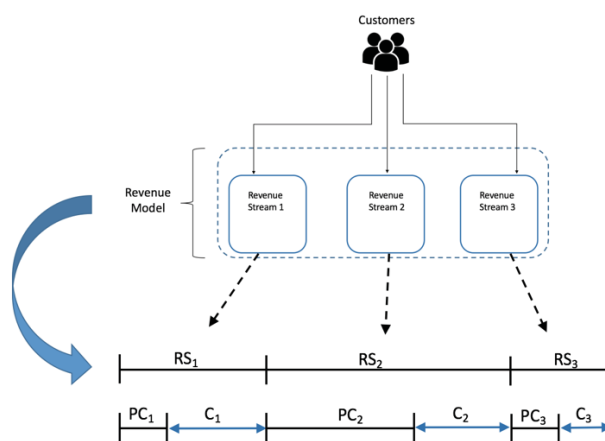
To better satisfy different customer needs, the supplier's revenue model consists of a configuration of revenue streams, each of them designed to meet different customer needs. This way, the supplier ensures the offerings suit most potential customers, thus increasing sales and market share, which can be translated into higher profit, naturally under the premise that costs remain in the same level.

Because a well designed and implemented revenue model can have a positive effect on market share and company profitability, it can be considered a source of competitive advantage for the company (Popp 2011b). For example, a company may choose to offer several services and only get paid for one or two. That way, the company's value proposition will be stronger than many competitors', which may not be able to offer services for free. In many cases, each product or service category offered by the company is related to one revenue stream, but again, this is not always the case (Popp 2011b). For example, some subscription-based service providers offer access to a combination of services for the same single fee. On the other hand, different revenue streams can be associated to the same product, which could be for example delivered in different ways.

For example, the Walt Disney Company achieves revenue out of its movies from various revenue streams. First, movies are shown at cinemas around the world. Second, copies of the same movies (DVDs or Blue Ray discs) are later sold to customers who prefer to watch the movies at home, and as many times as they wish. Third, same movies can be

watched from home through the Internet without the need of any physical disc, for example by renting them from Google Play Movies or by subscribing to some video-on-demand service such as Netflix or HBO. Fourth, after some time from their release, the same movies also reach free-to-air broadcast TV channels and their free streaming and video-on-demand services. All those different ways to deliver the product to the customers, in collaboration with partners and distributors, generate different revenue streams which contribute to achieve higher incomes for the company, than if only one or two revenue streams were available. But Disney's revenue model is much more complex than that. In addition to have a revenue stream configuration to maximize the revenue coming from movie products, the company also has revenue streams from various products such as toys, clothing, accessories, books, other children products and also, revenue generated from Disney parks and resorts, Disney channels and other media networks. Even the revenue stream associated to one Disney resort can be subdivided into different revenue streams associated to single products and services offered at the resort, such as specific restaurant, hotel, and souvenir products and services.

Often, firms have multiple sources of revenue even within the same market segment, and some are more profitable than others. For example, low-cost airlines like Ryanair or EasyJet sell economic plane tickets, however, that is not the only source of revenues for them. Instead, they sell all kinds of related services such as baggage, ticket name change, on board catering, on board shop, and hotel and car rental on destination. Interestingly, profit margins of those services are usually much higher than that of the plane ticket. The example illustrated how important is for firms to identify different sources of revenues in order to plan what value to offer to customers and what level of focus to apply in performing value-adding activities (Afuah 2004, p. 7). The figure below shows a simplified representation of a company's revenue model, and the different revenue streams which that revenue model consists of.

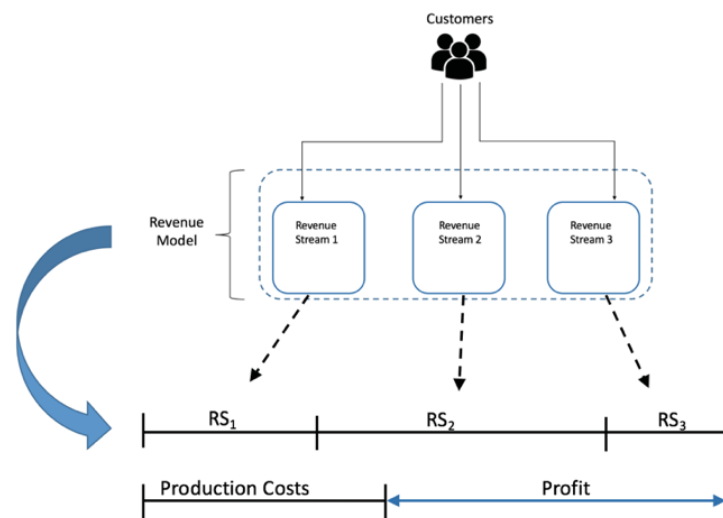


**Figure 14.** *Revenue model for multiple products.*

The company achieves greater revenue and profit thanks to the example revenue model configuration, compared to the case of having a revenue model made of one revenue

stream only. In this case, each revenue stream ( $RS_1$ ,  $RS_2$ ,  $RS_3$ ) is associated to a different product or service offered by the company, each one having its own production cost ( $PC_1$ ,  $PC_2$ ,  $PC_3$ ), thus contributing differently to company profitability (through contributions  $C_1$ ,  $C_2$ ,  $C_3$ ).

When companies reach economies of scale, or customers purchase copies of the same product (e.g. the case of Disney movies explained above), the production costs associated to the sales of one more copy are inexistent. In that case, planning a revenue model made of multiple sources of revenue can bring significantly better results for the company, as a larger customer segment can be reached, which increases sales and profit. This type of revenue model can be represented as shown in Figure 15.

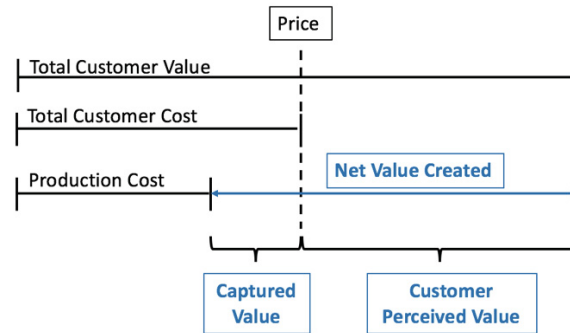


**Figure 15.** Revenue model for a single product with several revenue streams.

As the figure above shows, by figuring new sources of revenue for the same product, companies can increase sales with minimum additional costs, thus increasing profit. Moreover, that way companies can more easily ensure more constant cash inflows.

Value exchange takes place in supplier-customer relationships. The value created when a customer uses a product is to be divided between the customer and the product's supplier. The customer perceived value is the part obtained by the customer, whereas the captured value is the part obtained by the supplier. Figure 16 illustrates the idea.

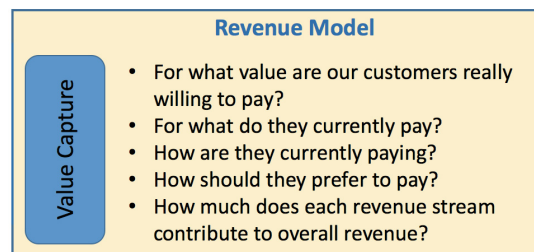




**Figure 16.** Customer perceived value vs Captured value.

The net value created by the supplier through a specific offering equals the total customer value minus the production costs, as it is shown in the figure above. That net value is to be fairly divided between the supplier and the customer. That is done by setting a price that is interesting enough for the customer, while the supplier makes an acceptable profit. The price determines how the value is distributed, being the customer perceived value the net value received by the customer, while the rest is the value the supplier captures as profit for the company, that is, the captured value.

To plan proper mechanisms of revenue acquisition aiming to capture value, a firm's revenue model should answer the questions shown in the figure below (Osterwalder et al. 2010).



**Figure 17.** Revenue model and Value capture.

As the figure above shows, in order to decide products and services prices aiming to capture value, it is important for companies not only to estimate how much value they are offering to their customers through their value proposition, but also to estimate how much monetary costs customers are willing to incur in. To figure that out, it might be key to learn how much customers currently pay for similar offerings, how the companies' offerings compare to those offerings and which payment terms would be the most beneficial for the customer. Finally, for the company it is strategically important to know how much each revenue stream contributes to company's overall revenue, and at the same time understand how much company resources are used in order to implement each revenue stream. This is especially important for small companies, which should understand which ones of the different revenue streams they are pursuing actually provides more captured

value and profit for the company. Failing to do this, tight company resources may be assigned to the wrong activities, which may lead to bankruptcy.

The list below shows some factors which affect how much value can the company capture, and thus affect pricing and company profitability.

- Competition
- Customer perceived value
- Solution technical complexity
- Degree of customization
- Initial investment

First, the more companies offering similar products and services, the more bargaining power the customer has. Moreover, market prices have to be used as reference. On the opposite, if a company is almost the only supplier offering certain products or services, it has more freedom and can set higher prices.

Second, the customer perceived value has to be more than the price the customer has to pay in exchange. Otherwise, there is no incentive for the customer to buy the product.

Third, if the solutions offered to the customer are technically simple, the customer may think it is worth implementing it in-house instead of purchasing it at a too high price from a supplier. Thus, it may be a bad idea to set too high prices for technically simple products, even if the customer value those products deliver to the customer is high.

Fourth, if the offering is highly customized to specific customer needs, there are less possibilities of finding similar products or services that would suit the customer business. Customization often means more production costs for the supplier, which logically has to be compensated through more premium prices.

Fifth, the initial investments necessary to develop and manufacture products or services can greatly vary depending on the industry. Certain products such as cars need huge investments in equipment, raw material, components, labor and facilities within others, while in other industries such as mobile app development a single person equipped with a laptop and an Internet connection can get started. Further, in some industries such as food industry or healthcare there are tighter quality standard certifications and other requirements which could take long time and significant amounts of money to acquire.

## **3.2 Generic Revenue Models Taxonomy**

Revenue model types heavily depend on the sources of revenues they intend to exploit to generate different revenue streams. Afuah (2004, p. 68) recognizes six primary sources

of revenue pursued by companies when executing their business models, independently of the industry. The primary sources of revenue are presented in Table 4.

**Table 4.** *Main sources of revenue (Afuah 2004 pp.68-70).*

Source of Revenue	Description	Example
Direct product or service sales	Products or services created by the firm or to which they have added value	Car manufacturer selling cars, e.g. Toyota, Seat, etc.
After-sales service	Services related to the products sold by the company	General Electrics (GE) servicing jet engines sold by them
Indirect content sales	Customers do not directly pay for the value they receive, but a third party does	Media (TV, radio, magazines and newspapers) where advertisers pay for most of the content value in exchange for the right to have their ads shown to the audience
Product financing	Revenue is collected from customers when financing the product	GE capital was responsible for over 42% of GE's total earnings in 2002
Collect-early, pay-latter financing	Investments based on time difference between receivables from customers and payables from suppliers	Dell customers pay for pcs immediately when making the order, but Dell pays its suppliers later
Royalties on intellectual property (IP)	Royalties from licensing patents and copyrights	Texas Instruments collected over \$1.9 billion on royalties in 1987-1994, while operations over same period reported \$1.3 billion

First, direct product sales or service sales is the most evident source of revenue, and refers to the sale of products or services that firms have created themselves or to which they have added value. Second, after-sales services refers to services related to the products sold by the company. After-sales services give companies the opportunity to maintain

long-term relationships with their customers, and many times it is the after-sales service source of revenue the most profitable one. Third, indirect content sales refer to sources of revenue in which customers do not directly pay for the customer value they receive. Instead, a third party pays for it. Fourth, product financing is a revenue source that provides companies with earnings coming from interest charges and other fees collected from customers when financing the product payment. Fifth, collect-early, pay-latter source of revenue emerges from the difference between company's customers' payment terms and those of its suppliers. When a company reputation and brand allows it to collect payments earlier from customers than they must pay suppliers, the money collected from customers can be invested. This activity, if done effectively, generates revenue. Finally, royalties on IP is a source of revenue used by firms that instead of commercializing their R&D outcomes, decide to obtain patents and copyrights and cash royalties to other companies for using their inventions.

To generate revenues from the selected sources, firms choose from a number of revenue models. Table 5 presents the primary sources of revenue and, marked with grey, the associated revenue models.

**Table 5.** *Sources of Revenue and Associated Revenue Models (based on Afuah 2004, p.68).*

Sources of Revenue	Revenue Model					
	Production	Subscription	Fee-for-Service	Markup	Commission	Advertising
Direct product or service sales						
After-sales service						
Indirect content sales						
Product financing						
Collect-early, pay-later financing						
Royalties on intellectual property						

As Table 5 presented, there are six generic revenue models that firms can employ, regardless of the industry. In a production model, companies create products or services that they sell to their customers. Once the transaction is done, the customer owns the product or the outcome of the service. In contrast, in a subscription model the customer pays a flat fee for the right to use the product for a specific period. Whether the customer uses the product or not, he still pays the fee. In a fee-for-service model customers only pay for

the service they use, without the existence of a flat fee. If the firm only acts as an intermediary between the product or service creator and the customer, the firm can use a markup or a commission revenue model. In a markup model, a firm buys products or services from manufacturers, mark up the prices and resell them to the end customers. On the other hand, in a commission model, a firm charges a fee for being an intermediary in a transaction between other parties. This model is used by brokerage and auction firms. Finally, the advertising model is the one used by media companies and internet sites such as Google and Facebook, where most revenue comes from the ads displayed to the end users.

### **3.3 Internet Revenue Models**

Advances in ICT have brought customers and suppliers closer to each other, and firms have started to exploit all possibilities offered by the increase in connectivity. ICT is present in business more than ever before. From products and services totally based on the new technologies, to more traditional industries using ICT solutions to boost their productivity, efficiency and effectiveness, passing by using Internet sites just as an interface between customer and supplier. Further, ICT has brought innovation also in the way companies do business and, as a result, new business models have emerged, partly due to the rise of new revenue models known as Internet revenue models.

Moreover, due to the existence of more transparent supply chain alternatives and low-cost provision of information and customer solutions, customer demands are higher (Teece 2010). This environment has made more relevant the importance of not only satisfying customer needs better, but also the importance of capturing value in more astutely ways, for example by providing new products and services enhanced through the benefits of ICT. This is crucial in the case of Internet companies providing software services or mobile applications, where the creation of revenue streams is often disconcerting because of customer expectations that certain services and information should be free (Teece 2010). This issue is often the case in certain open source environments, such as in the Android environment (Roma & Ragaglia, 2016).

As a result, Internet is essentially an ecosystem of various revenue models (and business models based on them) that allow both online and offline companies to make money. Over time, the most successful models in an industry predominate and the weaker models fade away (Barringer & Ireland 2010, p. 207).

Internet has revolutionized certain industries such as information, media and content-based industries. Traditional information providers like newspaper publishers used to employ a revenue model where the newspaper itself was sold quite inexpensively, while they were collecting succulent revenues from advertising (Teece 2010). However, the rise of

sites such as Monster or Etuovi has made many newspapers go out of business, while others have been forced to innovate their business models. In the case of TV, series and movie producers, and music artists there has also been huge business changes due to the arrival of companies such as Netflix or Spotify. Before, people use to obtain music and video content through the purchase of CDs, DVDs, by watching the TV, listening to the analog radio or by going to the movie theaters. Today, infinite amounts of audiovisual contents are a click (or a tab) away from consumers, which tend to access them more and more thought the Internet. This has caused the fall of the sales of CDs, DVDs and the closure of many movie theaters, forcing music artists, discographies and film production companies to reinvent their business models as well. For example, “Nokia Comes with Music” handset offered unlimited music downloads for a year, with Nokia passing on a fee to the recording companies (Teece 2010). An extensive classification of Internet revenue models composed by Rappa (2010) is presented in Table 6.

**Table 6.** *Internet Revenue Models (adapted from Rappa (2010)).*

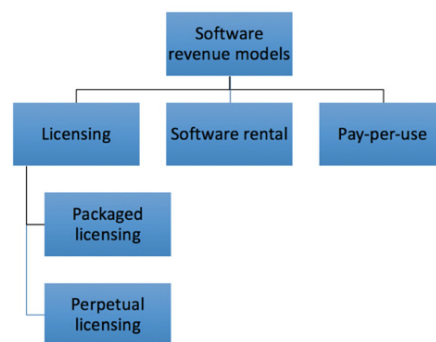
<b>Revenue Model Type</b>	<b>Description</b>	<b>Revenue Models</b>
Brokerage Model	Brokers bring buyers and sellers together and retain a fee or commission per enabled transaction	<ul style="list-style-type: none"> <li>• Marketplace Exchange, e.g. Orbitz</li> <li>• Buy/Sell fulfillment, e.g. CarsDirect</li> <li>• Demand collection system, e.g. Priceline</li> <li>• Auction broker, e.g. eBay</li> <li>• Transaction broker, e.g. PayPal</li> <li>• Distributor</li> <li>• Search Agent, e.g.</li> <li>• Virtual marketplace, e.g. Amazon</li> </ul>
Advertising Model	Web advertising model extends the traditional advertising model	<ul style="list-style-type: none"> <li>• Portal, e.g. Yahoo!</li> <li>• Classifieds, e.g. Monster, Etuovi</li> <li>• User registration, e.g. Facebook</li> <li>• Query-based paid placement, e.g. Google</li> <li>• Contextual advertising</li> <li>• Content-targeted advertising, e.g. Google</li> <li>• Intromercials, e.g. YouTube</li> <li>• Ultramercials, e.g. in some mobile games</li> </ul>

Infomediary Model	Information intermediaries that assist buyers and/or sellers in understanding a given market	<ul style="list-style-type: none"> <li>• Advertising networks, e.g. DoubleClick</li> <li>• Audience measurement services, e.g. Netratings</li> <li>• Incentive marketing, e.g. Kesko/S-chain bonuses</li> <li>• Metamediary, e.g. Edmunds</li> </ul>
Merchant Model	Wholesalers and retailers of goods and services	<ul style="list-style-type: none"> <li>• Virtual merchant, e.g. Amazon</li> <li>• Catalog merchant, e.g. Lands' End</li> <li>• Click and Mortar, e.g. Barnes and Nobles</li> <li>• Bit Vendor, e.g. Netflix, Spotify</li> </ul>
Direct Model	Manufacturers or service providers reaching buyers directly through the web	<ul style="list-style-type: none"> <li>• Purchase, e.g. Dell</li> <li>• Lease</li> <li>• License, e.g. software licensing</li> <li>• Brand integrated content</li> </ul>
Affiliate Model	Providing purchase opportunities whenever people are surfing the net.	<ul style="list-style-type: none"> <li>• Banner exchange</li> <li>• Pay-per-click</li> <li>• Revenue sharing, e.g. Amazon</li> </ul>
Community Model	Based on user loyalty. Revenue comes from side products, services or donations	<ul style="list-style-type: none"> <li>• Open source, e.g. Red Hat</li> <li>• Open content, e.g. Wikipedia</li> <li>• Public broadcasting, e.g. The classical station</li> <li>• Social networking services, e.g. Facebook, Tinder</li> </ul>
Subscription Model	Users are charged a fee to subscribe to a service	<ul style="list-style-type: none"> <li>• Content service, e.g. Netflix</li> <li>• Person-to-person networking services, e.g. Classmates</li> <li>• Trust services, e.g. Truste</li> <li>• Internet services providers, e.g. Elisa</li> </ul>
Utility Model	Based on metering usage or a "pay as you go" approach	<ul style="list-style-type: none"> <li>• Metered usage, e.g. Procontour</li> <li>• Metered subscriptions, e.g. Slashdot</li> </ul>

Two subcategories of Internet revenue models are of interest in this thesis: software revenue models and mobile applications revenue models. Next section reviews the different revenue models used in the software industry and those used by mobile applications providers.

### 3.4 Software and Mobile Applications Revenue Models

The figure below presents the most common revenue model alternatives used in software industry, both traditional (licensing) and more recently emerged ones (software rental and pay-per-use) (Ojala 2013; Ojala & Tyrväinen (2012)).



**Figure 18.** *Software Revenue Models (based on Ojala 20013 and Ojala & Tyrväinen 2012).*

Ojala & Tyrväinen (2012) distinguish two different license-based software revenue models which have been traditionally used by software vendors: packaged licensing and perpetual licensing. In packaged licensing a customer buys a single license intended for a single user or computer, whereas in perpetual licensing, the software is purchased for a certain number of users or computers.

The surge of new technologies, such as cloud computing, is changing the way in which software is delivered, sold and used. Cloud computing refers to the provision of computing capacity, storage capacity, and applications as a service across the Internet (Ojala & Tyrväinen 2012). Clouds can be classified as public, private or hybrid. In a public cloud, software providers use their own or a third party's data center, whereas a private cloud involves the customer's own internal data center where the software is installed and used in a centralized manner in the organization. Finally, a mixture between public and private cloud is called hybrid cloud. (Ojala & Tyrväinen 2012)

Cloud computing enables software providers to serve their customers using the so-called Software-as-a-Service (SaaS) model. In the SaaS model, customers can access software online as needed instead of permanently installing it on their computers. This ensures they always use the latest version of the software, and no longer need to worry about their



computer's technical specifications or storage capacity. (Ojala 2013) In SaaS, the software is licensed for a fixed term through a usage or periodic subscription fee. (Ojala & Tyrväinen 2012)

Ojala (2013) introduces two types of revenue models that are commonly used with SaaS: pay-per-use and software rental. With pay-per-use, there is a unit with a fixed price, and the customer is charged according to the number of units used. In software rental, the customer pays a negotiated subscription fee to use the software for a specific limited period. The price can be based on the length of the agreement, the number of users, the software's functionalities, or the customer company size. Further, if the supplier uses a third party's infrastructure as a service (IaaS) or platform as a service (PaaS) to provide the SaaS offering, the software can be priced independently. The benefits and trade-offs of the different software revenue models from the supplier's point of view, are summarized in Table 7.

*Table 7. Comparison of revenue models from supplier's point of view (Ojala 2013).*

<b>Model</b>	<b>Advantages</b>	<b>Disadvantages</b>
Pay per use	<ul style="list-style-type: none"> <li>• Diversifies customer base</li> <li>• Network externalities</li> <li>• Avoids software piracy</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of not breaking even</li> <li>• Usage records required</li> <li>• Low switching costs</li> </ul>
Software rental	<ul style="list-style-type: none"> <li>• Flexible pricing strategies</li> <li>• Diversifies customer base</li> <li>• Network externalities</li> <li>• Avoids software piracy</li> <li>• Usage records not needed</li> <li>• Higher profit if loyal customers</li> <li>• Cumulative profits</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of not breaking even</li> <li>• Low switching costs</li> </ul>
Software licensing	<ul style="list-style-type: none"> <li>• Easier to break even</li> <li>• Higher switching costs</li> </ul>	<ul style="list-style-type: none"> <li>• No diversified customer base</li> <li>• No income after purchase</li> <li>• Risk of piracy or misuse</li> </ul>

Firstly, pay-per-use allows software companies to reach customers that cannot afford to purchase traditional licenses, and customers that need the software only occasionally or for some specific purpose. Further, pay-per-use involves no hidden costs because customers do not need to set up nor maintain their own IT infrastructure. As well, customers have the possibility to evaluate the software and change to another one if necessary, as the cost is minimal. From the supplier point of view, in addition to enable reaching a more diversified customer base, pay-per-use revenue model also has the advantages of promot-

ing the network externalities effect and avoid piracy. First, the increased number of buyers increases the knowledge about the product within potential customers. Second, executing the software on a cloud server makes copying almost impossible. However, nothing is white or black and the pay-per-use model has also its disadvantages. First, for customers it is cheap and easy to switch to another software provider. Second, documentation of each customer usage of the software may require too much administrative work, raising the costs. Third, because initial incomes are low and uncertain, recovering from R&D costs is uncertain.

Secondly, rental model has the advantage of not requiring usage monitoring. Moreover, in the long run, the rental model might generate more revenue than other models if the supplier can maintain loyal customer relationships. Yet again, this model is not absent of trade-offs. For the supplier, the disadvantages are similar to those explained for the pay-per-use model, except for the need of auditing customer usage that does not apply to the rental model.

Finally, with the traditional licensing model customers purchase a copy of the software which they can use during unlimited time. Because in this case the price is much higher than that of pay-per-use or rental models, it is easier for the supplier to recover R&D costs and break even. As well, customer turnover rates are lower due to the higher switching costs involved. Nevertheless, pay-per-use and rental models are gaining ground to licensing models because the latter does not allow much customer base diversification. Small and medium-size customers which need the software occasionally are not targeted. Other disadvantages of the licensing model are the risk of piracy or misuse since the customer obtains a copy of the software, and the inexistence of incomes after the purchase is done.

Advances in wireless technology and the fall of ICT prices have resulted in the rapid increase of next generation wireless networks coverage and users across the world. According to the International Telecommunication Union (ITU), at the end of 2016, 99.7% of the world population owned a mobile phone subscription - compared to 76.6% at the end of 2010, and 33.9% at the end of 2005. The 4G mobile technology was launched in December 2009, and until the end of January 2015, more than a third of the global users were using 4G mobile data (Alomari et al. 2016). According to the Next Generation Mobile Networks Alliance (NGMN), 5G is planned to be launch in 2020.

Mobile phones are used extensively for entertainment and communication, and have become a part of personal accessories (Alomari et al. 2016). Thanks to the spread of mobile technology, and the first releases of Apple iPhone and App Store in 2007 and 2008, respectively, the software industry has witnessed the raise of a new software business modality: the mobile applications business.

Mobile applications (apps, hereafter) refer to software applications that run on smart phones and tablets. Typically, apps are developed by third parties, which can be either

software companies or individuals (Roma & Ragaglia 2016). The major mobile devices operating systems today are Google's Android and Apple's iOS. Because Android is an open source (OS) platform, devices running on Android are produced not only by Google, but also by other phone manufacturers such as Samsung, Ericsson and Huawei. In contrast, Apple's iOS is a closed-source or proprietary OS and runs only on Apple's iPhones.

Apps have been able to quickly reach large customer bases through the well-known Apple and Google's app stores, Apple's App Store and Google's Play. An app store is essentially an online distribution platform from which users can download software applications for mobile devices to increase the utility associated to their usage (Roma & Ragaglia 2016). App stores offer benefits to all actors involved. Mobile phone original equipment manufacturers (OEM) increase the value of their devices and operating systems thanks to the great number of available apps and other indirect network externalities. Developers get a distribution channel that allows them to reach consumers worldwide, which would be almost impossible to do in their own. Finally, consumers perceive the large variety of apps available for purchase thanks to higher number of developers. (Roma & Ragaglia 2016)

Mobile applications can be classified as a different type of software business, but, actually, they are sub-types of the three types introduced in previous section (product, professional services, and hybrid solutions). Thus, software companies deliver mobile applications which can be products, services or a mixture of product and services, with the particularity that those products and/or services run or are accessed through smart phones and tablets. In many cases, traditional software companies see mobile applications as a part of their business, but in other cases new ventures have been established only with the purpose of creating mobile applications. Although software products, services or combination of those can be technically designed to be consumed from mobile devices only, most of the software applications which are available for mobile devices only belong to the product group. Services or product-service combinations offered through mobile devices often have been originally designed as traditional desktop or Web applications, and have been later also provided as mobile applications to reach more customers and follow the growing business trend.

The app market has shown an astonishing growth, from less than \$10 billion annual revenue in 2011, up to an estimated \$70 billion by 2017. Together, App Store and Google Play cover almost 90% of the market. (Roma & Ragaglia 2016) According to Apple App Store Developer web site, 70% of app revenue goes to the developer, whereas 30% goes to the platform owner. Similar revenue-sharing rule applies in the Android ecosystem.

Roma & Ragaglia (2016) point out that in the app business there are some important decisions, which determine the success or failure of the apps. First, the type and number of apps to offer. Second, the operating systems to develop for, and therefore, in which app store to distribute the apps, and third, the revenue model for each app. The latest is

one of the most difficult (and yet crucial) due to the increased competitiveness in the mobile app market, which is causing many developers and mobile app-based startups suffer from low sales. There are three types of mobile app revenue models: (1) free, (2) paid and (3) freemium. Table 8 describes the three mobile app revenue models.

**Table 8.** *Mobile app revenue models (based on Roma & Ragaglia, 2016).*

Revenue model	Description	Revenue streams
Free	Customers download and use the app for free	Monetizing by means of advertising, and sometimes through non-personally identifiable data selling
Paid	Customers pay to be able to use the app	Monetization happens mostly by means of app sales
Freemium	Combines free and paid models. Customers can choose between using a low value free version or purchase a high valuable version	Monetizing from advertising in the free version, and by means of app sales in the paid version

First, in free revenue model users can download and use the app for free. Software firms and developers obtain revenue either by advertising other companies offerings or by selling user data to third-parties. A remarkable example of how to make the free revenue model profitable is the Facebook app.

Second, in the paid model the revenue comes from the direct sale of the app to customers, who pay to be able to download and use the app. To successfully monetize with this model, it is required to differentiate from similar free apps. An excellent example of successful paid app is WhatsApp.

Thirdly, freemium revenue model has gained in popularity thanks to the raise of the mobile app market. In 2014, 69% of gross revenue from iOS and 75% from Android devices was estimated it came from freemium model (Alomari et al., 2016). As introduced in Table 8, freemium model is characterized by combining both free and paid models (Alomari et al., 2016), offering customers the possibility to test the app and resolve the uncertainty about the real value to them, before making the decision to purchase the full version. Thus, the free version usually works as a trial version, which may include ads and has limited or time-expiring features (Roma & Ragaglia, 2016).

To complement the three revenue models described above, mobile app developers and software firms can make use of the so-called in-app purchase revenue stream. In-app purchase refers to providing app users with the possibility to buy extra-features directly from inside the app after they have downloaded and installed it, regardless of the revenue model – free, paid or freemium. Table 9 presents the advantages and disadvantages of the different mobile app revenue models explained above, as well as the app categories and app stores that are more suitable for each revenue model.

**Table 9.** Mobile app revenue model comparison (based on Roma & Ragaglia, 2016).

Revenue model	Advantages	Disadvantages	Most suitable app categories	Pref. app store
Free	<ul style="list-style-type: none"> <li>• Can rely on third party advertising and market info seekers revenue streams</li> <li>• Free for end users</li> </ul>	<ul style="list-style-type: none"> <li>• Needs a huge number of downloads to be profitable</li> <li>• Competition from other forms of advertising</li> <li>• Decline in the effectiveness of advertising on the Internet</li> </ul>	<ul style="list-style-type: none"> <li>• Newspapers</li> <li>• Magazines</li> <li>• Access to content</li> </ul>	Google Play
Paid	<ul style="list-style-type: none"> <li>• Profitable without huge amount of end users</li> <li>• Generates higher revenue than free apps</li> </ul>	<ul style="list-style-type: none"> <li>• People expects digital products to be accessed for free by the final user due to zero marginal cost</li> </ul>	<ul style="list-style-type: none"> <li>• Utilities (no customer value uncertainty)</li> </ul>	Google Play or App Store
Freemium	<ul style="list-style-type: none"> <li>• Allows market segmentation and to profit from both app purchases and advertising</li> <li>• Enables product trials</li> <li>• Better app revenue performance than free and paid models</li> </ul>	<ul style="list-style-type: none"> <li>• Less profitable than paid apps</li> </ul>	<ul style="list-style-type: none"> <li>• Utilities (customer value uncertainty)</li> </ul>	App Store

As previous table shows, the product category should also be taken into account when developing revenue models for apps. Free revenue models perform better for product categories for which users are not willing or have not traditionally used to spend money.

Paid or freemium models are more suitable for more complex product categories, which meet more sophisticated customer needs, thus delivering considerable value to customers. Paid model works well when there is no uncertainty about the customer value that the app will deliver to the customer, who will afford to pay immediately.

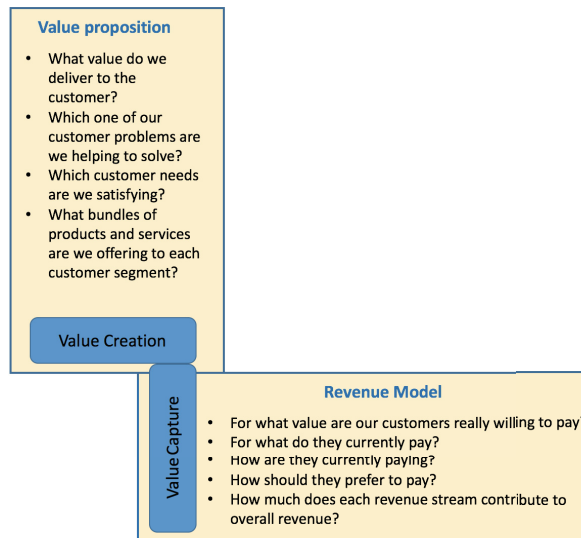
As it was mentioned above, in addition to select the most appropriated revenue model, companies need to decide in which app stores they want to release their apps as well. Because Android-based phones can only access Google Play store, and iPhones can only access Apple's App store, the only way providers can reach all users is by releasing their apps to both stores (Roma & Ragaglia, 2016).

Apple targets exclusively the high-end of the market, whereas the sales of Android devices are mostly determined by the low-end segments of the market. Therefore, consumers accessing the App Store are on average more valuable than those accessing the Google Play store. Google Play generates 70% more app downloads than App Store, but App Store generates 70% of total app revenue. Consequently, it is expected that payment-based models (paid and freemium) work better in App Store (Hyrnsalmi et al. 2012). Further, in Google Play the freemium model appears to be less effective than the free model, due to product cannibalization to which paid versions are exposed in the presence of a free version (Roma & Ragaglia, 2016).

Other point where revenue performance differs between Google Play and App Store is when it comes to the use of in-app purchases. Apps providing in-app purchases should achieve higher revenue than the equivalent that do not provide it, as a result of a finer-grained market segmentation that reaches more customers. However, evidence shows that this is only true in App Store, while the opposite effect shows in Google Play. (Roma & Ragaglia, 2016)

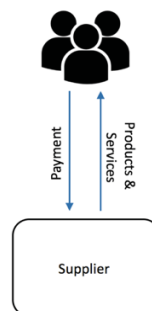
### **3.5 Link Between Value Proposition and Revenue Models**

Value proposition and revenue model are two important pillars companies' business models need to be built on, since they are in charge of ensuring value creation for customers and value capture for the company. The figure below illustrates the link between value proposition and revenue model.



**Figure 19.** *Value proposition and Revenue model (based on Osterwalder et al. 2010).*

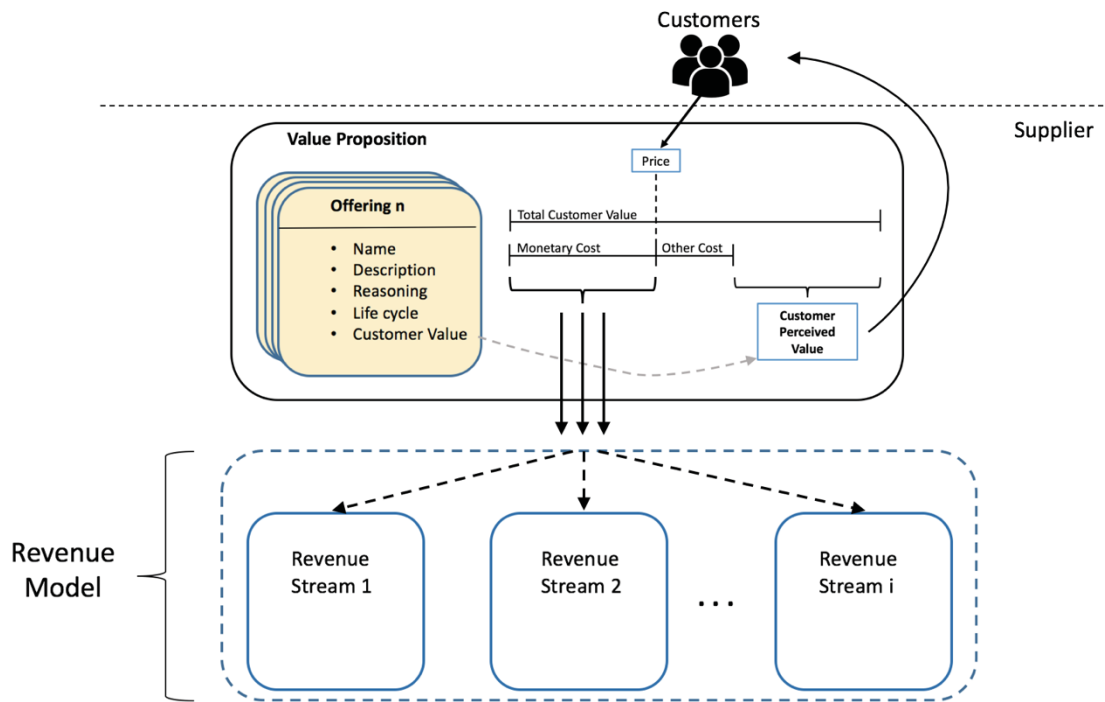
The exchange of value that takes place in the supplier-customer relationship is the key link between value proposition and revenue model, like it is visualized in figure above. In general, business relationships between a company and its customers could be represented as a value exchange, like it is shown in the following figure.



**Figure 20.** *Supplier-customer relationship.*

That value exchange may be more constant, like it occurs in long-term B2B relationships, or may happen in the form of transactions, like it is usually the case in B2C. Either way, the company delivers value to its customers through products and services that customers purchase from the company. On the other hand, customers compensate the supplier by paying the product prices or service fees. Both B2C and B2B sales can be explained with the concepts previously studied in this thesis: value proposition and revenue model. The idea is shown in Figure 21.

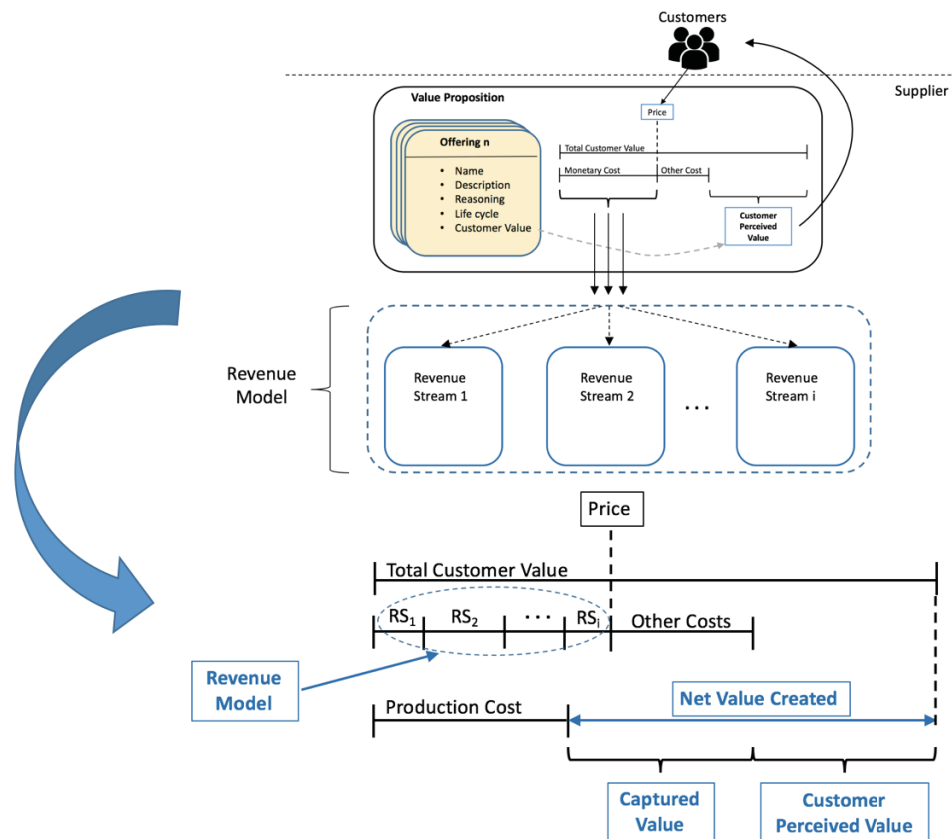




**Figure 21.** Value proposition and Revenue model.

The customer value analysis is the core of the value proposition, which explains the base of the value exchange between customer and supplier. The customer perceived value is the value received by the customers through the supplier's products or services, and can be calculated as the difference between the benefits received minus the costs incurred to get those benefits. As it was discussed in Chapter 2, the total customer costs include all costs incurred by the customer during the purchase, usage and disposal of the offering (Lyly-Yrjänäinen et al. 2010), which in turn can be classified into monetary, time, search, learning, emotional, physical, maintenance and risk costs (Horovitz 2000; Huber et al. 2010; Treacy & Wiersima 1995). As Figure 21 shows, the monetary costs determined by the price constitute the supplier's compensation, that is, the value the supplier receives as compensation for the product or service delivered. This compensation reaches the supplier as the different revenue streams the company revenue model consists of. In other words, the monetary costs assumed by the customers is the link between the value proposition and the revenue model. Therefore, the value exchange mechanism representation can be simplified as the figure below shows.





**Figure 22.** Value proposition to justify value capture.

The figure above shows how the revenue model affects the company's ability to capture part of the value created thanks to the products and services delivered by the company. Further, the revenue stream configuration, including the decision on which revenue streams to exploit, the different weights of each revenue stream and prices, determines how much of the net value created goes to the customer as customer perceived value, and how much is captured by the supplier. Moreover, it is worth noticing that customers can simultaneously contribute to the firm's value appropriation through more than one revenue stream.

However, business environments where firms operate rarely can be modelled in such a simple way, without considering other parties involved, in addition to customers and suppliers. Next chapter presents an overview of stakeholder theory and explains how the framework can take stakeholders in general into consideration when value is created simultaneously to more than one stakeholder.

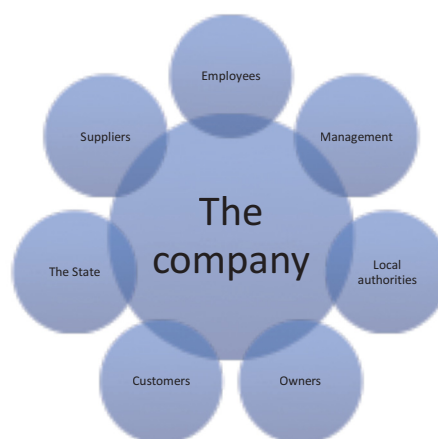
## 4. JUSTIFYING VALUE CAPTURE FROM DIFFERENT STAKEHOLDERS

### 4.1 Stakeholder Theory

According to Freeman and Reed (1983), the term stakeholder can be defined as “any identifiable group or individual who can affect the achievement of an organization’s objectives or who is affected by the achievement of an organization’s objectives”. When business activities are considered as to be divided into projects with specific goals, project stakeholders are all the different parties such as organizations, associations, institutions, consortia, and the people representing those, as well as any other private persons, which in more or less degree, are affected by the project or have the chance to affect the project and its success (Artto et al. 2011, p. 27). Stakeholders can have direct or indirect connection to the project, or to the resulting product or service (Artto et al. 2011, p. 32).

Edward Freeman has been by many identified as the founder of the stakeholder management theory back in 1980s. In his book, *Strategic Management: A Stakeholder Approach* (1984), he defended a stakeholder view of the firm, in contrast to the production and managerial views of the firm, more dominant in that time. (Eskerod et al. 2015) However, according to Freeman himself, the stakeholder term was first coined in the 1960s by the Swedish researcher Eric Rhenman (Strand & Freeman 2015). Indeed, Scandinavian societies have traditionally stood out at stakeholder engagement practices (Ihlen & von Weltzien Hoivik 2015), which may have links to democratic behavior (Strand et al. 2015).

In his book, *Industrial Democracy and Industrial Management* (1968), Rhenman points out the mutual dependencies between the focal company and other individuals and groups (i.e., the stakeholders). According to him, stakeholders depend on the company to be able to achieve their goals, and at the same time, the company depends on the stakeholders to achieve company’s objectives. (Strand & Freeman 2015). Rhenman visualized these ideas in the form of a stakeholder map (Strand et al. 2015), which is presented in Figure 23.



**Figure 23.** *Stakeholder map (based on Rhenman 1968).*

Rhenman's ideas about the importance of acknowledging and considering the various stakeholders, shifts strategic management attention away from traditional focus on competition and dominance towards attention to cooperation and mutually beneficial value creation, the antechamber of the concept of value co-creation. This mind set change can be inferred from Figure 23. The Scandinavian stakeholder approach supported by Rhenman depicts the firm, its suppliers and its customers as having shared interests, unlike Porter's vision in his Five Forces model, where the interests of a company, its supplier and its customers are shown in direct competition. (Strand et al. 2015) Moreover, Rhenman argues that a cooperative approach is more likely to produce favorable results (Strand & Freeman 2015).

Most likely influenced by Rhenman's ideas, in 1963 Stanford Research Institute (SRI) researchers defined stakeholder for the first time as "those groups without whose support the organization would cease to exist". It was later, in 1984 when Freeman affirmed that stakeholder is a person that "can affect or is affected by the achievement of the organization's objectives". A definition with a broader scope was introduced by Donaldson and Preston (1995), who argue that stakeholders are "persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity". (Strand & Freeman 2015)

Regardless of the type of community or business to which stakeholders are related, decisions and actions taken should consider the needs and expectations of stakeholders, even though different stakeholders usually have different, even contradictory needs and demands. However, in typical customer-supplier configurations, the goal is to promote the objectives of the customer, and strengthen supplier-customer relationships, and at the same time keeping other stakeholders content. (Artto et al. 2011, p. 26-27)

Managing stakeholder relationships and the supplier organization's own position in the stakeholder value network has been long recognized as a crucial, yet challenging activity in project business (Eskerod et al. 2015). Stakeholder relationship management not only can decide the future of a business proposal, but also have benefits for both customer and

suppliers and other stakeholders in the long-term as well. The trust and experience developed during a project may make the difference in future projects. Also, less preliminary work may be needed for future projects if the parties already know each other, thus longer and more profitable business relationships can be expected. Moreover, well managed stakeholder relationships help generating good formal references that can be useful marketing sources for acquiring future deals and new customers. (Artto et al. 2011, p. 36)

## 4.2 Stakeholder Classification

The main types of stakeholders influencing or being influenced by a company's business are customers and users. Firstly, customers are all individuals and organizations that purchase or order the company products or services, benefit from them, and pay the agreed price or fees to the company (Artto et al. 2011, p. 32). Usually, companies try to connect with their customers by satisfying specific needs they may have, thus targeting groups of customers with similar needs.

The relationship between companies and their customers can be quite different depending on the types of customers a company serves. There are two types of customers: B2C and B2B customers (Lyly-Yrjänäinen et al. 2010, p.1). B2C customers, or simply end-consumers purchase products or services without the intention to use those products or services benefits for any commercial end, whereas B2B customers, known as well as professional customers, acquire other companies' products in order to use them to obtain profit either by reselling them or by using them as factors or production (Lyly-Yrjänäinen et al. 2010, p.1) to generate new products or services.

Secondly, the users are the other main type of stakeholders. Users are individuals that make use of the company products and services, but they are not necessarily customers (Artto et al. 2011, p. 32). In the simplest case, the customer not only pays for the product, but also uses it to obtain the benefits promised in that offering's value proposition. Thus, the same individual acts as customer and user. But this is not always the case. A typical example where customer and user are different stakeholders is in the case of social media applications (e.g. Facebook). Social media users are the people who have registered as users, and use the service through their user profiles. However, even if the users receive benefits from their use of social media applications, they do not pay any fee and use it for free. Offering the service for free to the users is the tactic used by social media providers to build huge customers bases who are the target of advertising campaigns. Social media service providers' customers are companies which want to advertise their offerings in different social media sites. Nowadays, social media service providers use powerful machine learning and artificial intelligence algorithms thanks to which their customers' ads target users whose preferences match better the products and services being advertised.

Thus, social media service providers offer their customers with these advanced advertising services, paid by the customers, whereas the users access the social media site for free.

Frequently, companies operate complex business networks which have more stakeholders than the focal company, its customers and the users. In other words, often there are more parties which directly or indirectly influence or are influenced by the company business activities. Other stakeholder types are presented in Table 10 (Artto et al. 2011, p. 33).

**Table 10.** *Other stakeholders (adapted from Artto et al. 2011, p. 33).*

Stakeholder	Description
Suppliers	Subcontractors and other service providers.
Officials/authorities	Usually public parties that regulate matters related to the operating environment, manufacturing, implementation and the products/services or their components.
Financers	Investors, who expect profit but do not own or use the company products or services.
Media	Sources and channels of communication that reach the public and share information about the company, its products and services, and other related matters.
Other target groups	Any other individual or organizations affected directly or indirectly by the company or its products/services.
Competitors	Other companies offering products, solutions or services that can substitute a specific company offering, or that even in more indirect way competes for the same customer investments.
Other people	Other people participating in the company's projects or products' and services' manufacturing, whose wellbeing may affect or be affected, both directly or indirectly.
Society	Society in a broader sense, includes the state as a whole, and influences in employment, taxation, and environment in a broader sense.

When planning its value proposition and business strategy, the focal company must take stakeholders into consideration, and try to satisfy stakeholders needs, from more influencing stakeholders to less influencing ones. This way the company avoids unnecessary risks which may become critical issues impeding that the company reaches its objectives.

### 4.3 Understanding Value Capture from Different Stakeholders

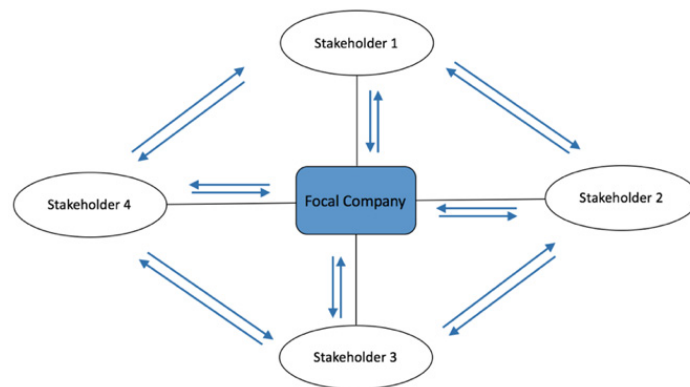
As it has been presented in this chapter, even though the Stakeholder Theory had its origins in Scandinavia in the 1960s, its popularity has increasingly raised during the 2000s, in hand with the raising importance of the concept of customer value. Indeed, researchers link the idea of superior customer value creation and capture to the development of value networks, consisting of different stakeholders (such as suppliers, customers and partners) related to a business (Zott et al. 2011).

Firms in a value network share common interests, which motivate them to develop relationships with each other for their mutual benefit (Ojala & Helander 2014). According to Allee (2008), value networks can be defined as any set of roles and interactions in which participants engage in both tangible and intangible exchanges aiming to obtain economic or social benefits. Thus, value networks aim at exchanging not only tangible assets such as specific products and services or monetary assets, but also important intangible assets such as professional expertise, relationships, employee know-how and competency, reputation or brand. Further, Allee (2008) argues that value networks need mechanisms to convert network intangible assets into tangible assets, which can be more easily exchanged between the network stakeholders.

Value networks can be internal or external. Internal value networks refer to activity-focused relationships between individuals belonging to the same unit, and between and among the various units of an organization. On the other hand, external networks include relationships between the organization and suppliers, investors (including venture capitalists), strategic business partners (e.g. a business with a complementary product), customers (Allee 2008), distributors, competitors, non-profit organizations, and bodies in public administration (Ojala & Helander 2014). For the purpose of this thesis, it is only relevant to study the role of different stakeholders in external value networks, which will be simply referred to as value networks.

Independently of the nature (tangible or intangible) of the assets exchanged between the different network stakeholders, they represent the value exchanged between networks' stakeholders. Value always needs a creator and a capturer, which in general are different actors in the network. However, it should be noted that all value network stakeholders have to both create and capture value. (Ojala & Helander 2014) Walter et al. (2001) argue that value creation and capture can be seen from a functional perspective. According to the function-oriented viewpoint, a company can obtain value from its relationships by both direct and indirect functions. Direct functions are responsible for value that can be measured financially and can be realized in the context of the relationship between the company and the customer. Indirect functions, on the other hand, require the participation of third parties, and the outcomes are less easy to measure financially.

Already in the 1960s, Rhenman suggested that stakeholders should cooperate instead of competing, and that way, more value will be created for the network participants. Further, to be successful in a value network, a firm needs to identify the value of its offering, including how this value can be delivered so that it benefits most critical stakeholders in the network (Allee 2008). Different kinds of resources that bring value to a firm have an important role in networks. By analyzing the value network and the motivation and interests of the value network stakeholders, a firm can create a stakeholder map consisting of the different stakeholders which could benefit from the company's offerings, and add value to the firm's own offering. (Ojala & Helander 2014) The result is a value network that provides the end-users with premium customer perceived value, leading to a win-win situation where all network participants add value and receive value as well, being the received value much higher compared to that if they would operate independently outside the network. By getting surrounded by partners with similar interests and encouraging cooperation between companies of the value network, objectives of companies in the value network could be more easily achieved than if they operate individually. An example of such a stakeholder map is shown in the figure below.



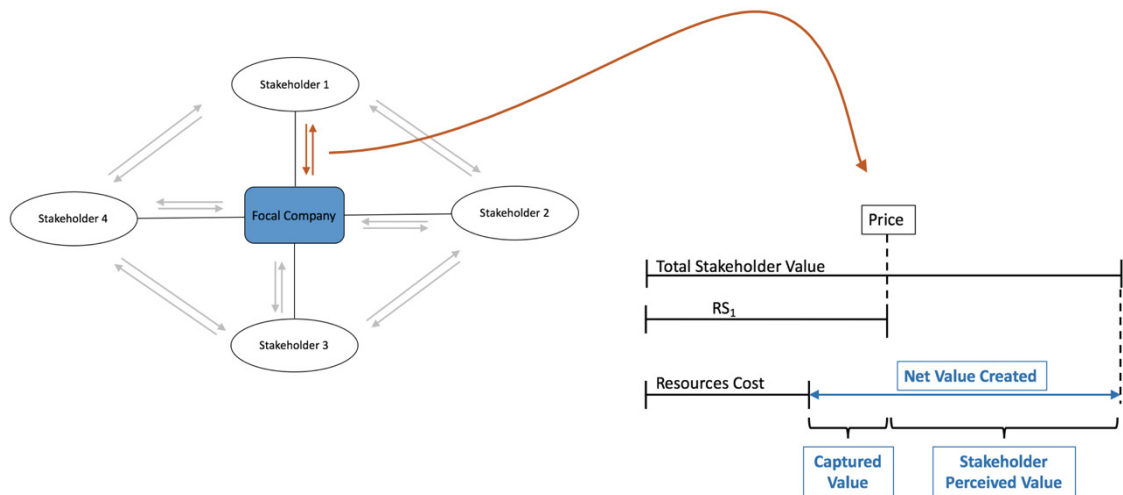
**Figure 24.** *Stakeholder map.*

Figure 24 shows a simple value network which includes a focal company under study, and four stakeholders related to the focal company business. The arrows represent value flows (i.e. exchange of tangible and intangible assets) between different stakeholders in the network. Thus, it is natural that if one stakeholder receives value from another, the former has to compensate its partner by delivering value to it in some other way. The most common ways how companies exchange value is through B2B customer-supplier relationships, where one company sells to another products and services which the customer companies uses to fulfil some needs aiming to produce and deliver offerings to their own customers. However, like it was explained above, sometimes the value exchange is more intangible or has not been productized. For example, companies can exchange value through information and knowledge sharing.

Value exchange between different stakeholders in a value network can be understood as a more generic type of customer-supplier relationship, where one of the parties delivers



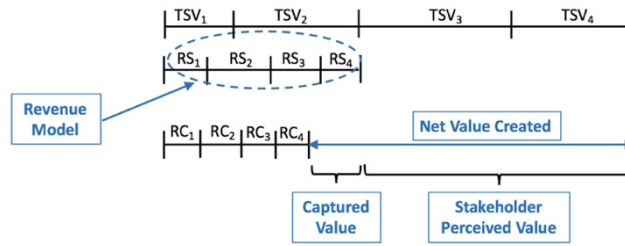
value whereas the other one receives that value. In that sense, value exchange between stakeholders can be modelled using the concepts of value proposition, revenue model and value capture, similarly to the way traditional customer-supplier relationships were modelled in Chapter 3. Moreover, only monetary costs obtain the value are taken into account, and other costs are considered insignificant. The figure below illustrates the idea.



**Figure 25.** Value analysis for one stakeholder.

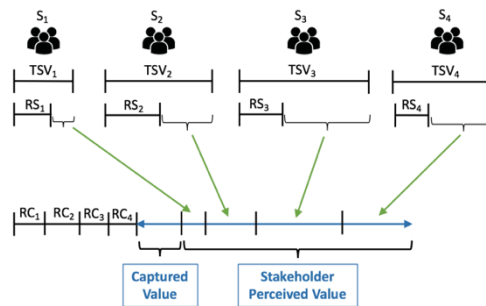
Figure 25 shows how the value exchange between the focal company and one of its stakeholders (Stakeholder 1) can be modeled. The focal company delivers certain Total Stakeholder Value to the stakeholder, who in exchange compensates the focal company becoming a revenue stream  $RS_1$  for the focal company (i.e. pay the agreed price). The costs assumed by the focal company are the Resources Cost, which refer to the total cost of the focal company resources employed to create and deliver the value to the stakeholder. On the other hand, the total value created thanks to the cooperation between the focal company and Stakeholder 1 is represented by the Net Value Created, which is distributed between focal company and Stakeholder 1. Thus, as the figure above shows, the Stakeholder Perceived Value is the value obtained by Stakeholder 1, whereas the focal company obtains the Captured Value. Considering the rest of stakeholders, the value exchange between the focal company and its stakeholders can be represented as the figure below shows.





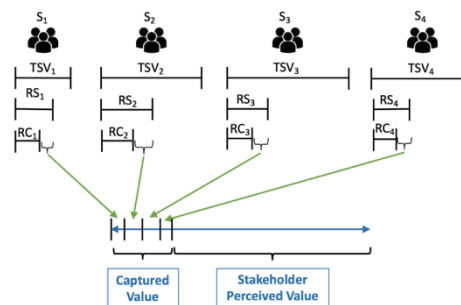
**Figure 26.** Value analysis for the stakeholder map.

In this case, the focal company delivers total stakeholder value  $TSV_1$ ,  $TSV_2$ ,  $TSV_3$  and  $TSV_4$  to the stakeholders Stakeholder 1, Stakeholder 2, Stakeholder 3 and Stakeholder 4, respectively. Resource costs  $RC_1$ ,  $RC_2$ ,  $RC_3$ ,  $RC_4$  refer to the resources used by the focal company in order to deliver the value to Stakeholder 1, Stakeholder 2, Stakeholder 3 and Stakeholder 4, respectively. Accordingly, revenue streams  $RS_1$ ,  $RS_2$ ,  $RS_3$ ,  $RS_4$  are generated when the different stakeholders compensate the focal company for the value delivered. So, in total, the stakeholders obtain the Stakeholder Perceived Value, whereas the total value that the focal company captures is represented by the Captured Value in the figure. In theory, the total Stakeholder Perceived Value is the sum of the stakeholder value perceived by each stakeholder, as described in the figure below.



**Figure 27.** Stakeholder Perceived Value.

Accordingly, the total value captured by the focal company is the sum of the value captured from the different stakeholders to which the focal company delivers value simultaneously. The idea is illustrated in the figure below.

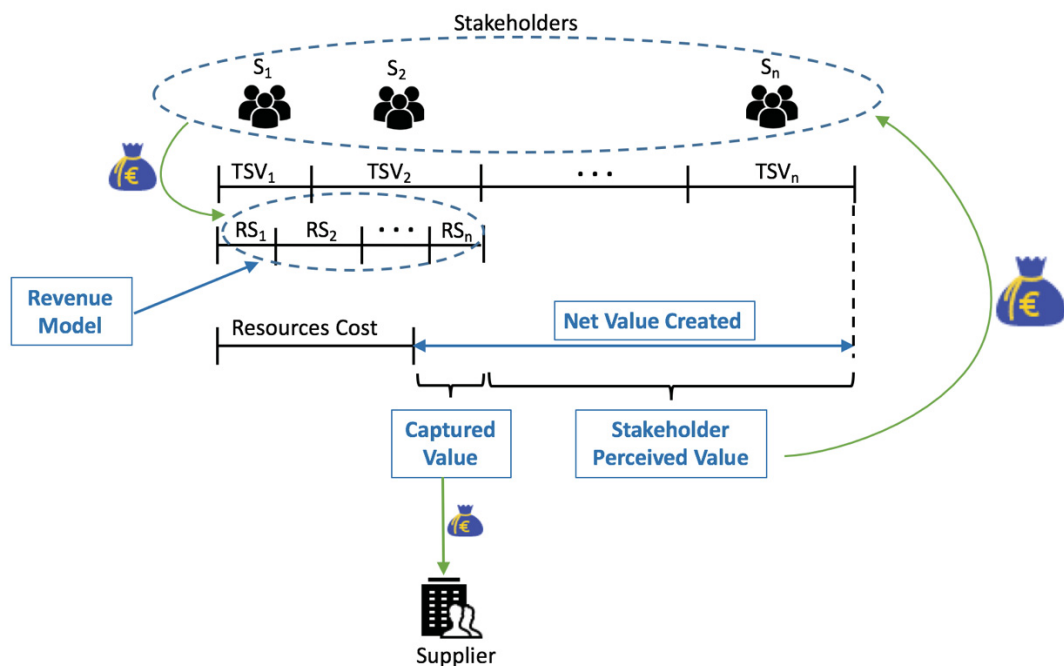


**Figure 28.** Captured Value.

For example, the value captured from stakeholder  $S_1$  comes from the price paid by the stakeholder minus the cost of the resources needed to deliver the service to that stakeholder, which equals  $RS_1 - RC_1$ . Similarly occurs for the other stakeholders. Resources Cost expression can be simplified as

$$\text{Resources Cost} = RC_1 + RC_2 + RC_3 + RC_4$$

Resources Cost refer to the total cost of the resources used by the company to deliver value to the stakeholders. In general, if the focal company has  $n$  stakeholders, and considering the expression above, the resulting theoretical framework is illustrated in the figure below.



**Figure 29.** Value propositions to justifying value capture from different stakeholders.

The framework justifies why the focal company should be able to capture value from the different stakeholders to which value is delivered to. To deliver that value to each stakeholder, the focal company uses some resources, thus incurring in costs. In addition to those costs, the focal company adds value e.g. in the form of know-how, and technological competences, adding value to the resources used, and thus delivering products and services of great value to the stakeholders. Because of this, the focal company should receive compensation from each stakeholder receiving value from the focal company, and this justifies the existence of a revenue stream coming from each stakeholder. Figure 29 describes how revenue streams coming from different stakeholders contribute to the total value captured by the focal company, and thus, it can be concluded that the framework justifies value capture from different stakeholders.

## 5. ICT IN THE FINNISH HEALTHCARE SYSTEM

### 5.1 The Finnish Healthcare System

Healthcare sector in Finland has different types of stakeholders with varying interests and purposes (Myllärniemi & Helander 2012). For ICT solutions providers aiming to commercialize their products and services to healthcare customers in Finland, it is crucial to study how healthcare services are organized in the nation and who are the important actors involved. The relevant stakeholders need to be identified, as well as their interests and influence over other parties.

According to Finnish law, all people residing in Finnish territory has the right to receive social welfare and healthcare services. The Finnish healthcare system is divided into public and private healthcare. (Ministry of Social Affairs and Health, SMT) The public healthcare services are mostly financed from public sources. Private healthcare services complement the public ones by offering other alternatives directly to the citizens as well as by offering their services to the municipalities. (Finnish Social Insurance Institution, Kansaneläkelaitos, KELA) Teperi et al. (2009) affirm that, in general, private healthcare services are used by patients who wish – and can afford – to choose their physicians or want to access a specialist without referrals or delays. In 2014, healthcare expenditure was financed up to 76.6% by public funds and 24.4% privately (Finnish National Institute for Health and Welfare, THL, 2016).

Finnish nation is divided into 311 municipalities. Local authorities have strong self-government based on local democracy and decision-making, as well as the right to impose taxes. On the other hand, the municipalities are responsible for the provision of basic public services to their citizens, including healthcare services (Association of Finnish Local and Regional Authorities, 2017), which makes Finnish healthcare system the most decentralized in the world (Häkkinen 2010).

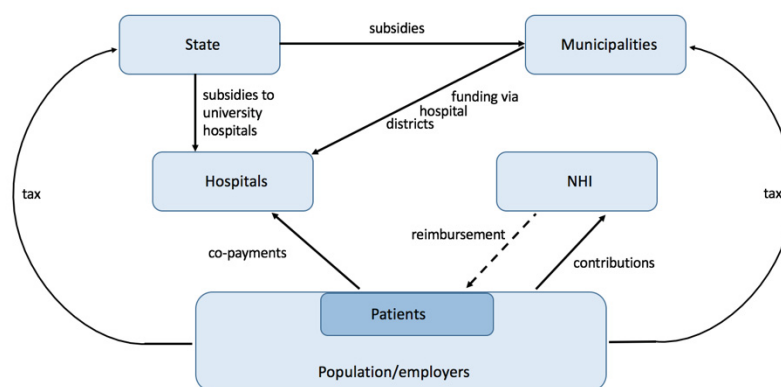
Municipalities offer primary and specialized healthcare. Primary healthcare is mainly provided at health centers, which are owned by municipalities or federations of municipalities. Health centers provide preventive care, ambulatory, medical and dental care, outpatient specialized services and, various public health programs, such as maternity and school health care. Occupational health services, services for specific patient groups such as diabetics and hypertension patients, and inpatient services such as acute short-term curative services and services for the elderly and chronically ill patients are also provided by the healthcare centers. Long-term care is provided at homes for the elderly, which are also under municipalities' responsibility.

Specialized medical care is offered by municipality-owned hospital districts (Teperi et al. 2009), with each hospital district being dependent on a federation of municipalities. Each municipality must be a member of a hospital district. (Kautianinen et al. 2011) In 2008, the largest hospital district oversaw over 1.4 million inhabitants, while the smallest oversaw only 65,000 inhabitants (Teperi et al. 2009).

Each hospital district has one central hospital and other hospitals as necessary, depending on the population of the municipalities belonging to the district. Five of the central hospitals, also act as university teaching hospitals. Finnish university hospitals are Helsinki University Hospital, Tampere University Hospital, Kuopio University Hospital, Turku University Hospital and Oulu University Hospital. Further, hospital districts are grouped into five tertiary care regions organized around the five university teaching hospitals. Tertiary regions centralized care delivery for some complex or rare conditions. Further, for about 20 extremely rare conditions care is centralized at national level, with only one or two tertiary care regions taking care of those patients. Lately, hospital districts have also started to establish condition-specific care units in contrast to the traditional individual specialties' units. That way, experts from various specialties work together to deliver more efficient and effective care. (Teperi et al. 2009)

Even though the long-term development of the Finnish healthcare system has been a success story, often cited as a model from which other countries might learn (Teperi et al. 2009), the way in which healthcare is organized in Finland has been often criticized, specially for the poor cooperation between the primary and the specialized healthcare organizations. (Pharma Industry Finland, 2017) To try to solve that, and other demanding issues in the Finnish healthcare system, some actions have been taken and others are under development. For example, during 2010-2016, KanTa, a national data system for storing and managing patient and prescription information in a digital form, was introduced (Kanta web site). Moreover, currently Finland is undertaking a health, social and regional government reform that aims to safeguard the basic public services, eliminating the inequalities in health and welfare, and reducing public costs (Association of Finnish Local and Regional Authorities, 2017), which continue to increase year by year.

Public healthcare services are mostly funded from municipal taxation, and a smaller part comes in the form of subsidies from the state. On the other hand, private healthcare services are paid mainly by the users, insurance companies and employers. (Häkkinen 2010) Municipalities fund primary healthcare center budgets based on previous year allocations. For health centers owned by more than one municipality, budgets are constructed in similar ways, but the distribution costs across municipalities usually depends on the volume of actual services delivered to the residents of each municipality. (Teperi et al. 2009) The following figure describes how hospital districts are funded in Finland (Häkkinen 2010).



**Figure 30.** *Hospital districts funding in Finland (Häkkinen 2010).*

Hospital district funding depends on the member municipalities. Municipalities pay to district hospitals according to the services used, up to 89% of all somatic care costs in 2008. About 2% of the total funding of district hospitals comes from state subsidies for research and teaching, and 4% from user charges. Maximum fees that hospitals can charge are defined by the Government, which in 2010 were €32.50 for an inpatient day, €27.40 for outpatient visits and €89.90 for day surgery. After €633 spent, patients receive care free of charge. (Kautianinen et al. 2011) As Figure 30 shows, funding is also coming from the National Health Insurance (NHI) scheme, which is part of the Finnish social security system. NHI partially covers, through reimbursements, private doctors' and dentists' fees and the costs of examinations and treatments prescribed by them, medication costs and transportation costs. NHI also provides sickness and partial sickness allowances. (KELA, 2017)

Municipalities and hospital districts negotiate annually about healthcare services volumes and costs. The budget of each hospital district is decided based on estimated volume of services (Teperi et al. 2009) by councils, which consist of members appointed by each municipality (Kautianinen et al. 2011). Also, major investments are decided by these councils.

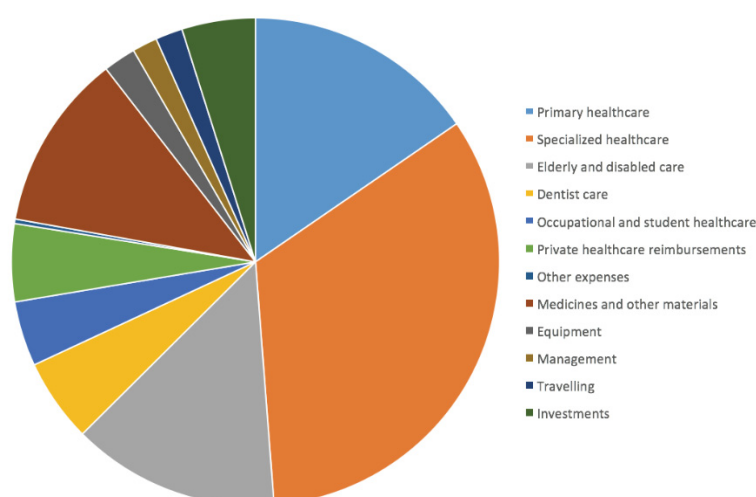
Hospital pricing systems are a way to allocate a hospital's costs evenly to the different municipalities responsible for their funding. There have been attempts, including a diagnosis-related groups (DRG) project in Europe to change hospital costing systems from a price-per-bed-day approach towards a more case-based, diagnosis-related group-based approach. (Kautianinen et al. 2011) However, still today there is no single unified practice for the invoicing of hospital charges to municipalities and the legislation does not define how hospital services productization prices are to be calculated. In primary healthcare, pricing is based in several costing techniques such as pDRG (primary care DRG-based invoicing) and APR (Outpatient treatment patient group), whereas in specialized medical care, the NordDRG method is the most commonly used (Choose Healthcare website, 2017). At the end, the situation is that hospital districts are free to determine how they

collect funds from municipalities in exchange for the services delivered, without the existence of nation-wide price lists (Teperi et al. 2009).

More unification and standardization of the DRG-based billing system would make comparison between hospital districts easier, encouraging competition and promoting operating efficiency in the hospitals. Moreover, it could lead to improvement in the management and provision of hospital services, such as more transparency and more accurate costing information. (Kautianinen et al. 2011)

Since hospital districts are governed by several municipalities and they charge each municipality on a fee-for-service basis, municipalities have less control over hospital expenditure than they do over spending by their own primary care health centers (Teperi et al. 2009). Thus, it seems that in the relationship between hospital districts and municipalities, the hospitals are more dominant.

According to the Finnish National Institute for Health and Welfare (THL, 2016), health care expenditure in Finland has grown by 50% in the last 14 years, totalling €19.5 billion in 2014. Figure 31 shows the expenses distribution into different categories.



**Figure 31.** Finnish healthcare expenditure distribution in 2014 (THL, 2016).

As it is shown in the figure above, in 2014 primary healthcare accounted for €3.8 billion (19.5%) of the total €19.5 billion, whereas specialized medical care expenditure, which increased by 0.1%, was a total of €6.8 billion (35.1%) that year. Other categories which also accrue an important part of the annual healthcare expenditure are medicines and other materials, elderly and disabled care, dentist care, private healthcare reimbursements and occupational and student healthcare.

Häkkinen (2010) has pointed out some trends towards which Finnish healthcare is moving to in the last years. Those trends are presented in the list below.

- Government involvement and monitoring
- Scale and scope
- Vertical integration
- Patient choice
- Hospital benchmarking

First, the involvement of the Ministry of Social Affairs and Health has increased in recent years, for example, by implementing some reforms which include guidelines related to the quality of healthcare services. Second, there is a clear trend towards increasing both the size of hospitals and the size of the purchasing municipalities. Third, local reforms have integrated service provision to a single organization in order to enhance cooperation between primary and specialized healthcare and social welfare services. Fourth, according to the Health Care Act (Choose healthcare website, 2017), patients have the rights to choose health centre and hospital from any location in the country. Also, health care professional (nurse or doctor) can be chosen if it can be arranged from the perspective of the health centre's operations. Finally, hospitals have been compared since the National Research and Development Centre for Health and Welfare (STAKES) launched the Hospital Benchmarking project in 1996, in cooperation with the hospital districts. Benchmarking data is collected to aim to improve and direct hospital activities.

## **5.2 ICT Innovations in the Finnish Healthcare System**

Digital solutions and information and communication technology (ICT) innovations enable enhancements in productivity, performance, efficiency, customer communication and satisfaction, promotes firms' innovativeness, reduces communication costs and facilitates firms to become global. Among other industries, healthcare has already profited extensively thanks to the development of ICT (Viitanen et al. 2011; Teperi et al. 2009). It is estimated that ICT helps offering healthcare that is safer, more responsive to patients' needs, and at the same time more efficient (Hyppönen et al. 2014). Today, large amounts of ICT systems are used in healthcare organizations to assist physicians and other healthcare professionals in their daily work with patients (Viitanen et al., 2011; Hyppönen et al. 2014).

Finland is one of the leading countries in global eHealth (Hyppönen et al. 2014). ICT is widely used in the Finnish healthcare system, and in general, healthcare professionals are considered to have good ICT skills. Electronic health record (EHR) systems were introduced in the early 1980s (Martikainen et al. 2012) and today cover all Finnish primary and secondary care organizations (Viitanen et al. 2011; Martikainen et al. 2012). Moreover, the KanTa national archive for electronic healthcare data with citizen access has been developed in 2010-2016 (Kanta web site) and it is now operative. Further, the already comprehensive IT infrastructure in healthcare, together with the advanced ICT skills of



healthcare professionals, is seen a strong advantage in the further development of eHealth (Martikainen et al. 2012), which aims to create a new working environment for healthcare professionals by incorporating ICT innovations and offering to the citizens the possibility of actively participating in decisions on their care.

However, there are challenges related to the implementation of norms, standards and interoperability of ICT systems as healthcare providers are decentralized (Viitanen et al. 2011). Although the benefits of technology and other ICT innovations are theoretically obvious, they are not used by healthcare professionals in their daily work (Viitanen et al. 2011) as much as they could. Many healthcare ICT implementations find critical to define strong standard patient datasets to support clinical care processes, facilitate new technologies to enhance patient safety and care quality, and to ease statistics collection to monitor healthcare services quality (Hyppönen et al. 2014). Moreover, designing efficient and usable interfaces for those datasets is another difficult task (Martikainen et al. 2014).

Finnish physicians are dissatisfied about the ICT systems they have to use and their ability to support routine tasks (Viitanen et al. 2011; Martikainen et al. 2014), specially regarding the systems' usability and deficiencies, and their ability to support healthcare processes (Martikainen et al. 2012). Physicians believe that the end-user point of view is missing in healthcare IT development, while the developers lack enough knowledge in healthcare and most medical doctors participating in IT development work in administrative positions, thus lacking perspective. The low success rate of IT projects, with only about 34% successful projects, does not help the situation. (Martikainen et al. 2014)

Although Finnish physicians show good IT skills and ICT systems are widely used in healthcare, physicians have a critical attitude towards the adoption and usefulness of healthcare IT systems, being the time needed to use the systems the biggest barrier for them (Martikainen et al. 2012). According to Raitoharju (2007), the perceived usefulness of IT is a critical factor conditioning the IT use within healthcare personnel. The benefits of the system for a particular employee are likely to be quite blurry. However, explaining the benefits of the system for the whole organization could increase the acceptance of IT. To promote the acceptance of IT to all the sub-cultures within healthcare organizations, training and support should be targeted more specifically to certain professional groups. (Raitoharju, 2007) Further, healthcare managers should try to align employee incentives to the delivery of superior value for the customers, aiming to increase efficiency and effectiveness of the healthcare system as a whole, even over specific units or organizations' goals.

According to Teperi et al. (2009), in Finland, almost all hospital workers are salaried hospital district employees. On one hand, this is positive to avoid the over-treatment phenomenon present in many forms of productivity-based compensation methods. However, on the other hand, healthcare employees are not either offered incentives to see additional



patients within the public system, resulting long waiting lists through the country. Kau-tianinen et al. (2011) argues that there are no clear direct financial incentives or disincentives for the use of new technologies by the hospital districts. Municipalities, on the other hand, have as goal to provide their citizens with the best possible healthcare services, and at the same time to achieve such a quality service in the most cost-efficient way. Thus, municipalities are interested in making sure that their money is used for effective technologies and digital solutions, rather than have it wasted on something less effective.

One of the most critical issues that Finnish healthcare system is facing is the continuous increment of costs. However, in healthcare, setting a goal to reduce costs is one of the surest ways to increase long-term costs and worsen outcomes. In the medium and long run, the best way to keep costs at a reasonable level is to improve quality. (Teperi et al. 2009) In this context, it is wise to invest in software solutions and other innovations that aim not only to increase the efficiency of healthcare professionals, but also to increase their effectiveness. Various software products can help doctors and nurses to deliver higher quality health care services, which in the long run will maintain costs lower thanks to prevention and avoidance of the need of more costly treatments and procedures. Digital innovations and IT play an important role in supporting and enabling disease prevention, early detection, accurate diagnosis and faster treatment. Moreover, healthcare outcomes depend on patients' participation and commitment to their care (Teperi et al. 2009). Therefore, IT systems which intend to increase the patient participation in turn increase the ability of the healthcare system to create and improve value.

In addition to improvements due to progress in different fields of clinical research and medical technology, innovations related to the organization of care delivery have great potential to drive improvement in value. Particularly in Finland, service delivery innovations have been recognized as one of the key performance drivers of the healthcare system, and because of that the government funds municipal projects with these types of innovations in mind. (Teperi et al. 2009)

Healthcare IT systems procurement is highly decentralized in Finland, having each health center and hospital district deciding independently on which IT systems to procure (Martikainen et al. 2012). This creates a challenge for IT providers, forced to maintain relationships with a large number of small customers. In addition to that, due to differences in processes and operations between different healthcare centers and district hospitals, the efforts associated to serve one customer are quite high compared with the value captured from that single customer. Consequently, a wide diversity of disintegrated information systems is in use, and ICT development in healthcare has a compartmentalized nature (Martikainen et al. 2012). Due to the language barrier, the small market size and the peculiar healthcare system, Finnish healthcare sector is not attractive for international vendors. Because of that, IT systems for Finnish healthcare are locally developed in Finland, with two larger vendors controlling most of the market. (Martikainen et al. 2012)

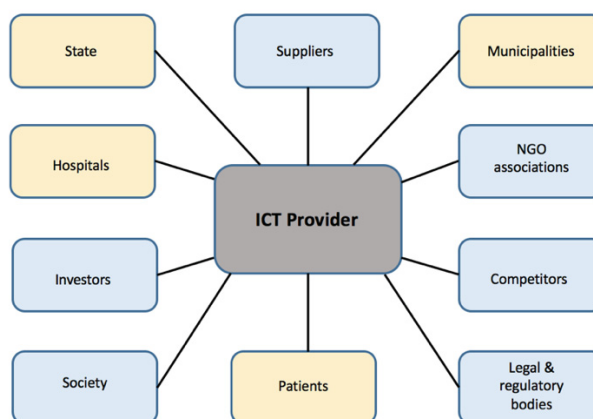
Funding decisions related to innovative technologies, such as the introduction of new digital solutions, are made at hospital districts or department/clinic level, without the existence of any national regulation. Only, evidence related to the cost-effectiveness of the solution being assessed seems to be required. The Finnish Office for Health Technology Assessment (Finohta), together with district hospitals, oversees providing new technologies' safety and effectiveness information to support hospitals in decision making about new technologies. However, it is uncertain how exactly each hospital district make these types of decisions. (Kautianinen et al. 2011)

To summarize, although it is in the benefit of all Finnish citizens that municipalities and district hospitals encourage investments and improvements in the use of IT innovations to ensure long-term quality and cost-efficient healthcare, the reality is that healthcare organizations and their managers do not always actively seek for new and promising IT systems, neither incentive their employees to make efforts to follow such strategy. Instead, organizations short-term budgeting goals and employees' personal preferences may be hindering the success of many eHealth projects and initiatives. However, government major strategic healthcare-related goals include the increase in the use of IT and other innovations to find alternatives and new ways to deliver high quality healthcare services to Finnish citizens, and at the same time dealing with structural issues such as the aging population, the increasing prevalence of chronic diseases and the need for cost reductions.

### **5.3 ICT Solutions Stakeholders in the Public Finnish Healthcare System**

A nation's healthcare system can be seen as a value network consisting of many different types of stakeholders with various interests and purposes, and complex relationships between them (Myllärniemi & Helander, 2012). Due to the variety of stakeholder's goals, together with the influence and decision power differences between them, the result is a situation where some stakeholders affect others with their action, whereas others are affected by the actions of others.

In the case of ICT solutions providers in healthcare sector in Finland, the network of stakeholders, somehow involved in their business activities, can be visualized in the figure below.



**Figure 32.** *ICT-related stakeholders in Finnish healthcare system.*

As Figure 32 shows, the ICT provider is the focal company under analysis, and for that reason is positioned in the middle of the stakeholder map. Stakeholders which most influence or are influenced by the focal company are situated around it in the stakeholder map, and their interests and influence related to the focal company business are analyzed. The most influential stakeholders (State, Hospitals, Municipalities and Patients) are highlighted in yellow in the figure above.

**The State.** It is in the best interest of the State that ICT innovations and new systems are introduced in healthcare aiming to improve efficiency and effectiveness. For this reason, the State organizes and funds different development programmes to support new initiatives and projects.

**Municipalities.** Welfare and healthcare services are mostly organized and financed by municipalities. The expenses resulting from healthcare services delivered to the citizens of a municipality are covered by the municipality where those citizens reside. However, whereas primary care – including elderly care – is directly organized and financed by the municipalities, secondary care is organized by hospital districts, which in turn bill the municipalities for the services delivered to the municipalities' citizens. Therefore, regarding ICT innovations and systems which target primary healthcare processes, the municipalities can be seen as direct customers with purchasing power.

**Hospitals.** Specialized care is delivered by the hospital districts, which bill municipalities for the services given to their residents. ICT systems targeting specialized healthcare processes which take place within hospital districts are purchased by the hospitals, because they are seen as tools or systems the hospitals need to be able to deliver the services. Nation-wide common systems (e.g. KanTa database) are funded by the government, but for smaller unit-specific systems the purchasing process is not strictly regulated, being the specific units' managers in charge of evaluating and making ICT purchasing decisions. Therefore, this leads to a situation where ICT systems aiming to boost specialized healthcare efficiency and effectiveness should be translated into costs reductions, being

the municipalities the theoretical main beneficiaries. However, for the municipalities being able to get those cost reductions benefits, the service fees should be negotiated accordingly. ICT systems which are proven to reduce the amount of healthcare services needed by the municipalities' residents would directly mean cost reductions for the municipalities. Overall, municipalities' money would then be more wisely spent.

**Patients.** The patients are the customers of any healthcare system. All parties involved should aim to deliver high quality healthcare services to the patients. Therefore, patients benefit from ICT systems which help healthcare professionals deliver the best possible healthcare services. Further, in cases where patients are users of the systems, their collaboration is crucial for the systems to work correctly. Usually, patients do not have much influence power to decide whether to use the systems or not, but they have to agree to follow the processes established by healthcare organizations. However, ICT providers need to take patients into account as possible users of their systems.

Other stakeholders which have are more indirectly influenced by a specific ICT provider focal company in the Finnish public healthcare environment are investors and suppliers of the company, competitors, non-profit non-governmental organizations, legal and regulatory bodies, and the society in general, within others.

## 6. THE CASE COMPANY

### 6.1 The Challenge

Epilepsy is one of the most common neurological diseases globally, affecting approximately 65 million people worldwide (Liu et al. 2016), and with another 2.4 million new cases diagnosed very year (World Health Organization, WHO 2017). According to Finnish Epilepsy Association, approximately 1% of Finnish population suffers from epilepsy, which is about 55000 epilepsy patients. Studies in the area revealed that epilepsy incidence is higher in those aged 60 or more, and the highest in childhood. A slightly higher incidence was noticed in males than in females (Forsgren et al. 2005). Further, the incidence of epilepsy over time decreases in children, whereas it increases in the elderly. (Kotsopoulos et al. 2002)

According to the International League Against Epilepsy (ILAE), epilepsy is a “disorder of the brain characterized by an enduring predisposition to generate epileptic seizures and by the neurobiologic, cognitive, psychological, and social consequences of this condition” (Fisher et al. 2005). The concepts of epilepsy and epileptic seizure differs from each other as the occurrence of a single epileptic seizure does not imply epilepsy, whereas the predisposition to generate epileptic seizures results in an epilepsy diagnosis.

Fisher et al. (2005) define epileptic seizures as “transient occurrences of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain”. Epileptic seizures have three characteristics (Fisher et al. 2005): mode of onset and termination, clinical manifestations, and abnormal enhanced synchrony of neurons. Firstly, epileptic seizures have a clear start and finish times. The mode of onset and termination refers to the characteristics describing the start cause and the termination of an epileptic seizure. Secondly, epileptic seizures are clinical events, and as such, signs and symptoms are referred to as clinical manifestations. Seizures affect at least one of the following: sensory, motor and autonomic functions, consciousness, emotional state, memory, cognition or behavior. Thirdly, abnormal enhanced synchrony of neurons refers to the uncontrolled electrical discharge typical of epileptic seizures.

Epilepsy is a treatable condition, with about 50% of cases achieving seizure remission soon after the first treatment, and another 15-25% more after changing the treatment once or twice. However, about 15-25% of patients have drug-resistant epilepsy. In those severe cases, surgery may help. (Forsgren et al. 2005)

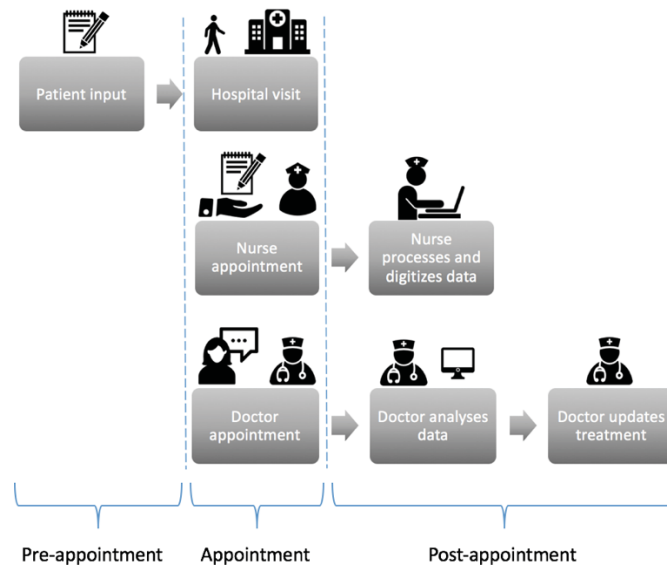
Epilepsy is a cost-intensive disorder (Strzelczyk et al. 2008). Living with uncontrolled seizures not only has a negative impact on the quality of life of epilepsy patients and their

caretakers, but also imposes a substantial burden on society due to the considerable use of healthcare resources (Liu et al. 2016; Forsgren et al. 2005).

Recent research has demonstrated that mobile phones applications have the potential to improve the treatment and management of chronic disease. In developed countries such as Australia or the United States, seizure management apps are already in use. (Liu et al. 2016) There has been increasing recognition in clinical guidelines of the importance of epilepsy self-management programmes in improving treatment adherence, controlling seizures and reducing the negative impacts of epilepsy on patients (Pandher & Bhullar 2014).

Epilepsy patients or their caregivers need to keep a seizure diary to help monitoring and keeping track of changes related to the frequency and characteristics of the patient seizures. Currently in Finland, patients (or their caretakers) keep record of the seizures by means of pen-and-paper epilepsy diaries. After each seizure, patients write in their diaries some general information about the seizure, such as date and time, duration, type of seizure (e.g. clonic, absence, tonic, etc.), location where it happened, activity that was in course, and trigger that most likely caused the seizure. Epilepsy diaries need to be carried everywhere and some patients may need to keep record of up to 50-100 seizures a day.

Epilepsy patients regularly visit their epileptologists, usually in the nearby hospital district epilepsy unit serving the municipality where they reside. The visits' frequency, test and procedures delivered by the specialized epilepsy unit to each patient depends on the severity and need each case presents. Moreover, patients are in contact with the epilepsy unit nurses each time there is a change in their condition. Nurses, in turn, make consultations to epilepsy doctors about the patient, according to previously stored patient data and the information given by the patient through the phone. Doctor's treatment updates are informed to the patient by the nurse afterwards, and new doctor appointment is scheduled if necessary. For urgent and more severe condition-worsening cases, patients directly go to the nearest emergency room or call an ambulance. Finally, for extremely severe cases which cannot be managed at home, patients are taken to nursery homes where they receive 24/7 care. Each time a patient has an appointment with his epileptologist, the process described in Figure 33 takes place.



**Figure 33.** *Patient visit process.*

As the figure above shows, different steps are currently needed to get to the doctors the data required to follow up each patient and make decisions regarding treatment and medication.

First, patients need to accurately and manually keep a diary about their seizures. That means that they must carry pen and paper everywhere they go. In addition to that, patients need to contact their nurses every time there is a significant change, having to wait telephone queues and delays regarding the processing of the new data by doctors, until they finally get a treatment update or a new appointment is scheduled if needed. Because of those telephone consultations, the epilepsy unit nurses have to prepare hard copy summaries of the consultations to be sent by mail to the patients. Thus, it is obvious that hospital district epilepsy units spend a considerable amount of resources to arrange the patient seizure data acquisition, and also the patients have to go through an amount of different time consuming steps.

Secondly, when an appointment is needed, patients visit the nearest hospital district epilepsy unit. first meets a nurse, who gets basic status information from the patient as well as a copy of the latest version of the epilepsy diary. After that, the actual doctor appointment takes place. During the doctor appointment, routine neurological tests are done by the doctor and the overall status of the patient is assessed based on the test results, the physical condition of the patient and the information given by the patient. The doctor then decides whether more tests and procedures are needed, as well as if there is a need to consider medication adjustment or even medication changes. The decision is informed to the patient and the appointment ends. About a week later, the patient receives a letter with a summary about the appointment and follow-up decisions made by the doctor.

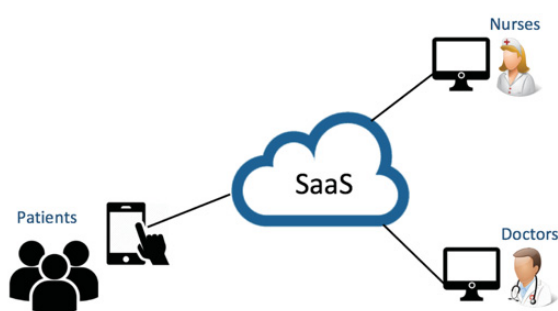


After the appointment, nurses need to review epilepsy diaries' data and process it to obtain basic statistics on patients' seizures, to have an overall picture on whether the patient condition is the same, better or has worsened. First, nurses digitalize the content of epilepsy diaries in order to have all patients' information in a more standard form. Also, basic statistics such as number of seizures a day or a month are manually obtained by using standard office tools, e.g. Microsoft Excel. The data processed by the nurses is then used by doctors to review patients' status and further consider treatment updates or other needs. The data is also used in epilepsy unit patients' review meetings, where the cases under the supervision of the unit are reviewed.

## 6.2 The Case Company

The case company where this study was conducted is a Finnish healthcare ICT service provider. The company started as a Tampere University of Technology spin-off in 2013, and currently has office in Tampere, Finland. At the time of writing this thesis, the company operations are focused on developing customer relationships mainly in the public Finnish healthcare sector.

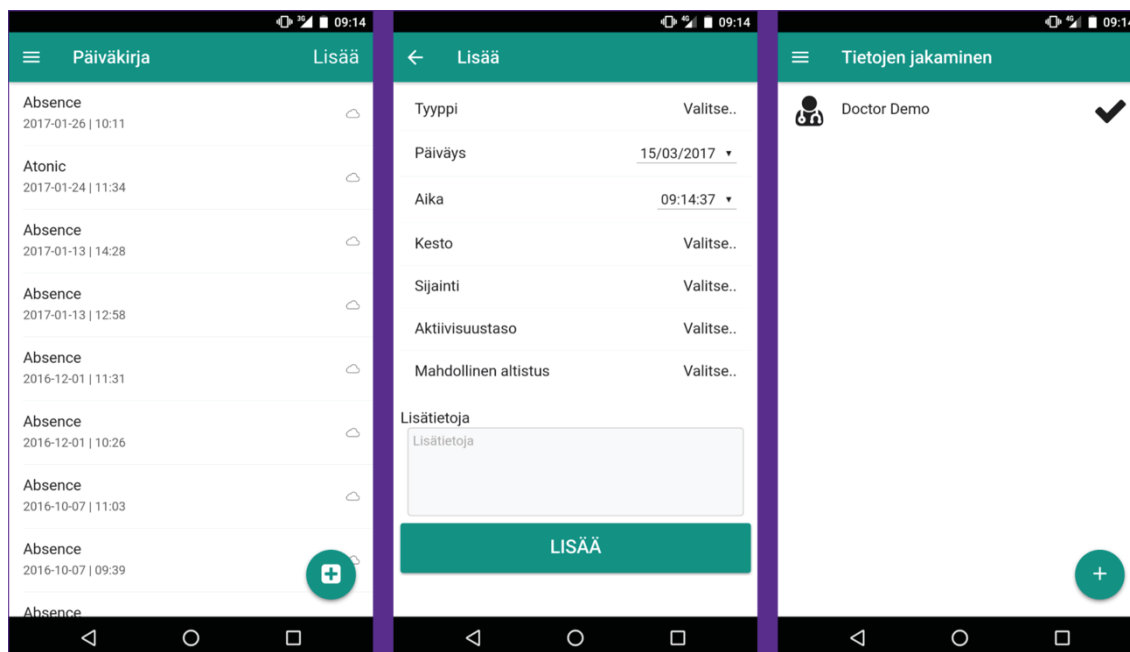
The company offers digital solutions for epilepsy patients and epilepsy related healthcare organizations. The case company has developed a system based on cloud computing technology, which allows patients to report new seizures in real time, allowing medical staff to easily monitor all the patients under their care. The system uses epilepsy diaries in a digital form, which allows data to be exchanged electronically between the parties involved, thus simplifying and making more efficient and effective all processes related to seizure diaries. Figure 34 presents the idea.



*Figure 34. Case company system.*

Patients can easily input their seizure information by using the case company epilepsy diary app. By easily selecting from lists, seizure characteristics such as seizure type, date, duration, location, level of activity and trigger are entered. Also, a free-text field where patients can add comments for their nurse is available. Screenshots of the app are shown in the figure below.





**Figure 35.** *Epilepsy diary app.*

Once a patient enters a new seizure, the data is automatically stored at the epilepsy cloud from where it can be accessed later, by both patients and their treating nurses and doctors to who access have been granted. Doctors and nurses access the seizure data without delays and more importantly, without the need to schedule unnecessary and costly appointments.

Healthcare professionals access the patients' seizure data through a web application, thanks to which patients can be remotely monitored. Patient seizure data is presented to the doctors in ways that is easier to grasp the important information at a glance, by using visual components and different charts to show statistics of the patient status and current medication plan. Based on that information, doctors could schedule future appointments, and in many cases, reduce the number of annual visits per patient, providing significant savings to the municipalities and allowing hospitals to assign resources to where they are needed the most. Moreover, nurses would not need to process nor digitize epilepsy diaries or handle other type of paper diaries anymore, and the amount of patient consultations handled by phone decreases. Thanks to this system, the inconvenient, error-prone and time demanding task of manually processing traditional paper epilepsy diaries can be avoided, allowing medical staff to concentrate in more important activities, thus obtaining important cost savings. The system improves the quality of the care given to epileptic patients, because more accurate treatment and faster response to changes can be given thanks to the higher quality data provided to nurses and doctors. As well, healthcare organization's efficiency and effectiveness is improved.

From the patient point of view, the possibility to use their smart phone as a mobile epilepsy diary is of a great advantage and undoubtedly improves their quality of life. Patients

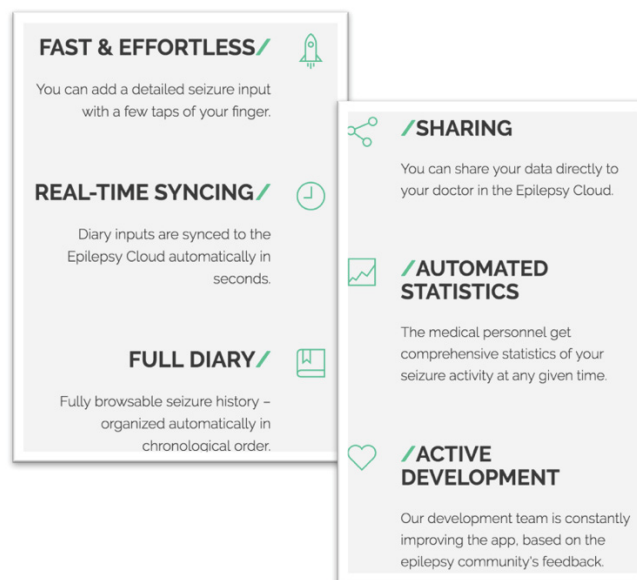
will be highly benefited by being able to enter to the system each seizure occurrence in just few seconds and by the possibility to review their information quickly through their phone. The resulting new process is described in the figure below.



**Figure 36.** *New process.*

The new process is simpler, faster, more accurate, with less human errors, provides with more standard data and with significant cost savings due to the reduction of (1) nurse time spent in digitalizing diaries, phone calls and paper work, (2) the number of needed appointments thanks to real-time remote monitoring of patient seizure data, and (3) the need for acute and inpatient care.

Despite the benefits the system offers, the case company is currently facing the challenge of constructing a strategy to justify value capture from the various stakeholders involved. Case company's current value proposition is available to stakeholders through the company's web site, Youtube videos, sales material and brochures. Although the material is concise and successfully lists the benefits of the product, it focuses mostly in functional benefits, as Figure 37 shows.



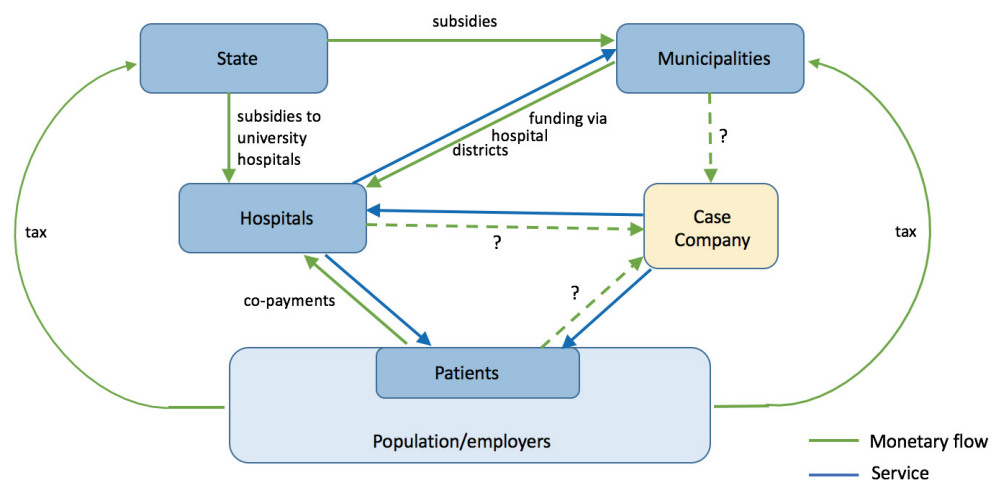
**Figure 37.** *Case company current value proposition.*

Considering that the target stakeholders belong to public healthcare organizations, and that economic benefits are usually the triggers for decision makers, value propositions which highlight economic benefits are considered in this thesis.

Moreover, the case company's current value proposition shows all the benefits for all the stakeholders, thus the different parties may be overwhelmed with benefits which they do not need, making it difficult for them to find the two or three points in which the product satisfies their needs. The benefits are even more blurry to the stakeholders because some IT knowledge and skills are needed to fully understand how the product works. This thesis suggests solving these challenges by creating custom value propositions for each stakeholder, so that benefits relevant for a specific stakeholder are clearly stated, highlighting the economic value for them. Such value proposition will be built in the next section.

### 6.3 Building the Value Proposition

The value proposition proposal will be built based on data gathered from official sources and qualitative data gathered from info sessions and meetings with relevant healthcare professionals and the case company representatives. The case company value network's most relevant stakeholders are shown in Figure 38.



**Figure 38.** Case Company and its stakeholders (based on Häkkinen 2010).

As it can be seen in Figure 38, the service and monetary flows that take place are complex due to the complexity of the Finnish healthcare system. However, the most important aspect for the case company to consider when building the value proposition is to understand which stakeholders are benefited by the case company's offerings and how can be value be demonstrated to them.

The case company delivers ICT services to patients and hospitals. On the other hand, the hospitals deliver healthcare services to patients and to municipalities. Thus, in this setup, patients and municipalities can be seen as hospitals' B2C and B2B customers respectively, whereas hospitals and patients can be seen as B2B and B2C customers of the case

company respectively. However, as it was described in previous chapter, and as it can be inferred from the figure above, municipalities must have a financial interest in what it concerns ICT innovations that can enhanced the healthcare services delivered by the hospitals, its effectiveness and efficiency, because that affects the annual healthcare costs of each municipality. In a nutshell, if hospitals can deliver better and more cost-conscious services thanks to the use of ICT systems as the one proposed by the case company, the annual healthcare costs should decrease for the municipalities.

In addition to understanding the relationship and money flow between patients, hospitals and municipalities, it was important to obtain deeper knowledge about the different stakeholders. Gathered empirical helped obtaining such a knowledge. One stakeholder subgroup which greatly benefits from the product's functional benefits is the hospital districts' nurses of the neurology department. Certainly, they are in charge of processing and digitalizing patient seizure diaries, and they do not have any automation for that except for basic office tools such as Microsoft Excel. Therefore, this activity is error-prompt, slow and tedious, but needed to keep track of patients' condition. Indeed, many nurses immediately recognized the great value the case company's product would deliver to them, thus it can be concluded that case company current value proposition successfully reaches the nurses. The CEO of the company agrees with this:

*“It has been much easier to approach the nurses. Some have said that our product is exactly what they need”*

However, in some cases the concerns about adopting and learning a new IT system show up in an industry that tends to be more traditional, especially regarding care delivery and other internal processes. During one sales presentation, despite being very positive about the product, finally one of the nurses commented that:

*“We are a traditional organization, and we are used to do things in the traditional way...”*

Despite the fact that nurses' work will be greatly benefited by the product, and even though approaching nurses and communicating value to them has been easy, the truth is that nurses do not have decision power. It is the doctors who must evaluate the value the solution brings to the department and decide if it is worth trying it, and later commit to the case company through a contract. The low decision power of the nurses and the strong hierarchy in healthcare sector, where doctors make decisions and their opinions are considered over nurses' opinions has been noticed by the CEO, who commented that:

*“When both nurses and doctors are present in our sales presentations, nurses tend to be quieter and mostly doctors make comments and ask questions. But, in some presentations where only nurses attended, they are a lot more talkative, ask questions and more easily give their opinion”*

Releasing nurses from the tedious manual tasks of processing and digitalizing patient epilepsy diaries does not seem to be a reason strong enough for the neurology departments to commit to the solution. Purchasing decision is made by the doctor chief of the department and proof of the economic value seems to be the indispensable condition for a positive answer. Indeed, potential customers want to perceive the value the solution offers for their organization. In one session of the Tampere Executive MBA for Social Welfare and Healthcare leaders, when asked what is needed for them to make decisions regarding the acquisition of a new product, one of the leading doctors stated that

*“We need to test the product and evaluate whether the seller promises regarding the economic value delivered by the product can actually be realized. We need to consider competing solutions as well, and see which one it is the best option. All these takes a lot of time”*

It seems fundamental to show to the stakeholders how the product creates value for them, test it, measure it and present specific results as part of the value proposition. Then, stakeholders expect to have a trial period when they can perceive the promised value by themselves. But, the provider needs to do the homework before hand, and present specific economic value figures as part of the value proposition. By no means should the stakeholders be expected to calculate the economic value by themselves because they will not and most likely will not consider the provider’s proposition in that case. Healthcare decision makers do not have the time, and usually neither the IT and business skills to grasp the economic value some IT system offers to their organizations. Therefore, IT providers should make the economic value explicit in their value propositions. This idea is supported by the comment of one laboratory chief participating in the MBA session mentioned before:

*“We have the people and the equipment in place (to do some task), it works and it is not that expensive, so it is difficult to see the benefits of ICT or other innovations”*

The comment above shows that the resistance to change to a potentially better solution is caused by uncertainty related to other purchase and usage costs, in addition to the economic costs (purchase price). The effort needed to learn and adjust to the new process play an important role, specially because there already is a process in place which is known and gets the job done. This idea is also backed up by the fact that a nurse from the pediatric neurology department of another Finnish hospital district showed great interest in the product, however, asked to be contacted once a pilot has been done for pediatric patients in other hospital. Organizing agile pilots seems to be a way to save effort for all the parties involved, as the representative of a healthcare-related NGO explained

*“We try some services the way that we arrange agile pilots with the provider visiting us once a week. After few months, we check if the product has been useful for the organization and decide whether to continue using it”*

Regarding the patients, as it was mentioned in the value proposition proposal for patients, they are an indispensable piece of the process. The benefits of the system for the different stakeholders, including the patients, cannot be realized unless the patients commit to using the app to report their seizures. Only then, the costly services surrounding the process based on pen and paper diaries will be reduced and even eliminated. As well, only when patients are regularly using the app, remotely monitoring can be realized, and unnecessary appointments can be reduced. However, it is the patient decision whether to use or not the app. As stated by one hospital unit representative in the MBA session:

*“We cannot tell the patients they should use an app”*

The researcher proposed to reach patients through epilepsy NGOs, but when the case company CEO met the local epilepsy NGO representative, she explained that the association always takes a neutral position regarding suppliers asking for advertising to patients through them. Further, she explained that they try to protect patients, who are vulnerable and thus prefer to be cautious.

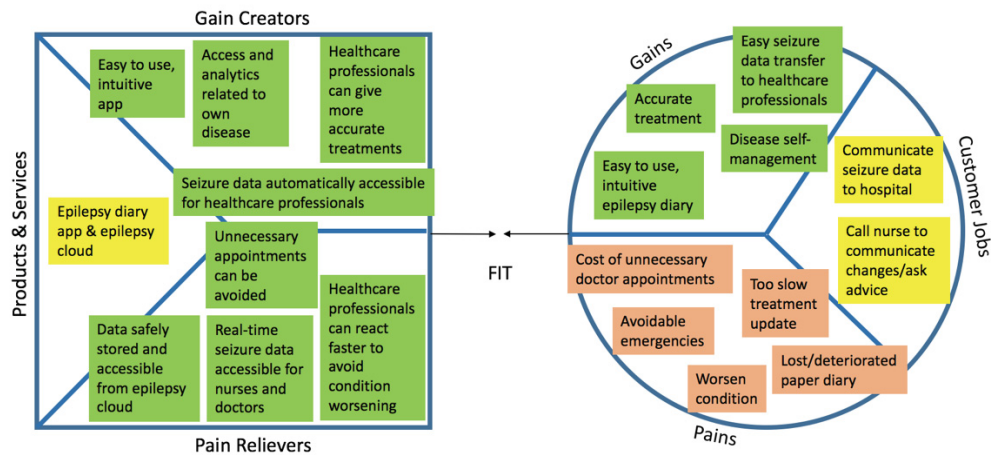
In any case, there is evidence that under the current process there is room for unnecessary appointments. If the hospital district epilepsy units would have the case company’s product in place and have the patients recording seizure data and receiving some feedback and recommendations through the app, unnecessary appointments would be avoided. The parent of an epileptic pediatric patient explained it like this:

*“We receive letters from the hospital with the schedule for the following appointment two or three times a year, even if the situation has been under control thanks to the medication. Last time it took about two hours from work to take the kid to the appointment and nothing special happened there. The situation was the same as the last time we were there, and honestly it felt like a waste of time. Perhaps, in these kind of cases appointments could be scheduled only if there is some change”*

In this type of setup, to build a superior value proposition it is important to target the needs of each stakeholder separately, and build value propositions customized to each stakeholder. Next, a value proposition proposal is built to target patients, hospitals and municipalities separately.

## **Patients**

A value proposition canvas proposal for patients is presented in Figure 39. Patients jobs, pains and gains are on the right side, whereas case company product and services, gain creators and pain relievers that match patient needs are in the left side.



**Figure 39.** Value proposition canvas for patients.

Even though many of the benefits offered to patients are functional and psychological, thus difficult to quantify, there are also quantifiable economic benefits which can be used to demonstrate that economic value of the product exceeds the costs.

The minimum patient costs associated to one appointment consists of the 37€ average patient fee and the travelling expenses. The travelling expenses can vary between few to couple of tens of euros depending on the means of transportation used and the distance to the hospital. For example, if a patient only needs to take a two-way bus ride within his town the cost would be around €4, but if the patient is driving from a town 50 km away from the hospital, parking fee and gasoline expenses have to be considered. According to this, it can be argued that by reducing an average of 2 appointments a year, the value created for each patient can be approximated as

$$\text{Average Patient fee} = €37$$

$$\text{Min}_{\text{travel expenses}} = €4$$

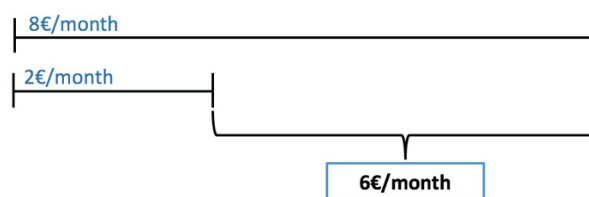
$$\text{Gasoline} \sim €14, 2\text{h-parking fee} \sim €2 \rightarrow \text{Max}_{\text{travel expenses}} = €16$$

$$\text{Average travel expense} = (16 + 4) \div 2 = €10$$

$$2 \times (\text{Patient fee} + \text{Average travel expense}) = €94/\text{year} \approx 8€/\text{month}$$

For a patient fee of 2€/month, the perceived value for the patient would be about 6€/month. Value analysis for patients for one month is visualized in the figure below.





**Figure 40.** *Value analysis for patients.*

However, estimating the cost savings for patients is not that simple as it can be influenced by several different factors specific to each individual. The amount of economic value the solution offers to each user depends greatly on how much is worth time to the specific patient. The value of the time lost in an unnecessary appointment is rather different for the CEO of a company than for a retired patient. Despite the importance of the economic value over functional or emotional benefits in general, in the case of patients the functional and emotional benefits play an important role. At the end, it is their health what is at stake, and the importance of having their seizure data reach their nurses and doctors, and thanks to that get better treatment is more important than few euros a month they might save thanks to using the app.

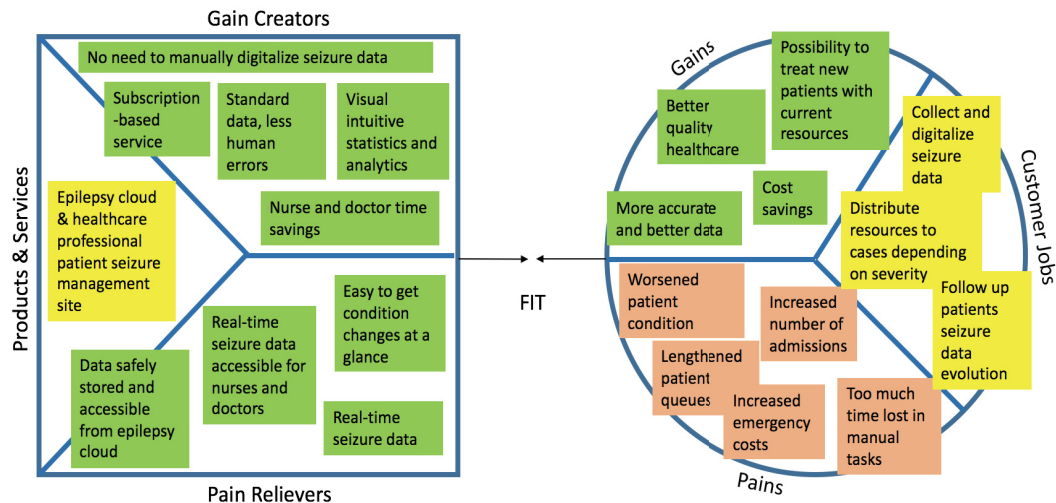
One point which must be enforced in the value proposition refers to the ease of use of the app. Resistance to use the app to record seizures is expected from some patient groups, especially from aged patients and those with less IT skills. The IT provider should organize training sessions and create training material to target those more resistant groups. This is of great importance because the benefits that the system offers to the rest of the stakeholders, totally depend on the percentage of patients using it. For those patients that do not use the new system, the old process would need to be kept running, and at the end, having to run two different processes may turn to be more expensive than sticking to the current manual process that is in place.

Finally, it is worth noticing that targeting pediatric patients could be more profitable for the case company as it would be the parents who would be partly in charge of managing the app use for their children. Because parents of pediatric patients are middle age and have been more in contact with technology than older patients, resistance will be less probable in this case. Moreover, thanks to the pediatric patients, the value proposition could be extended to reach more stakeholders. For example, daycare and school teachers are responsible for the wellbeing of epileptic children during part of the day, and they need to report, currently to parents, the seizures that take place during school/kindergarten hours. Later parents need to pass the information to the epilepsy diaries and/or to the epilepsy unit nurses. Also, general practitioners and nurses at primary healthcare centers need to know the overall state of pediatric patients in order to adjust to the patient's needs. This is the case of doctors and nurses in charge of following up the development and correct growth of children across the country.



## Hospitals

Next, the value proposition to target hospital stakeholders is built. The value proposition canvas for hospitals is presented in the figure below. Functional and emotional benefits are selected according to the gathered qualitative data.



**Figure 41.** Value proposition canvas for hospitals.

In the case of hospital customers, the time saved from nurses and doctors provides with the possibility to treat more patients and reduce the long waiting lists without the need of contracting more healthcare employees. Other way to see it, it is that the amount of labor needed to cover a specific number of patients decreases, thus reducing the labor costs of hospitals' epilepsy units. For example, nurse and doctor time can be saved by reducing unnecessary patient appointments, by eliminating the need of manually digitalizing and filtering patient seizure data, and by reducing the number of patient phone consultations. Further, the resources needed to run the ER and inpatient services are reduced thanks to avoiding status-changing epilepsy cases to develop into more severe cases which result in hospital admissions and ER visits. In addition to that, quality of the care is improved thanks to providing healthcare professionals with more standard and less human error-prone data. Case company product also provides with visual analytics for fast patient follow up. Also in this case, the economic benefits can be estimated, which helps analyzing the value offered to district hospitals epilepsy units.

According to Finnish Epilepsy Association, approximately 1% of Finnish population suffers from epilepsy, which is about 55000 epilepsy patients in Finland. There are 21 healthcare regions, and as a rule of thumb it can be approximated that about one hospital per healthcare region treats all epilepsy patients residing in the municipalities served by that healthcare region. Therefore, if at least two unnecessary appointments of 2h could be reduced per patient per year, time saved from nurses and doctors can be calculated as

$$55000 \div 21 = 2619 \text{ epilepsy patients per hospital}$$

$$2619 \times 2 \times 2 = 10476 \text{ man-hours} \sim 1309 \text{ man-days from both nurse and doctors}$$

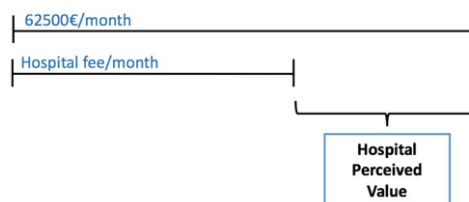
Furthermore, if the time it takes to the nurse to manually digitize and process patient epilepsy diaries is about 30 min per patient per appointment, additional nurse time savings are about

$$2619 \times 2 \times 0,5 = 2619 \text{ man-hours} \sim 327 \text{ man-days from nurse}$$

Finally, if at least an average of 15 min nurse time and 15 min doctor time could be saved per year per patient thanks to one reduced phone consultation per year, additional nurse and doctor time savings are about

$$2619 \times 0,25 = 654,75 \text{ man-hours} \sim 82 \text{ man-days from both nurse and doctors}$$

Summing up, the total nurse and doctor time that can be potentially saved every year is equivalent to the work of 7 nurses and 5 doctors. Assuming that, including all social security and other expenses, wages of one nurse is about €50.000 a year and wages of one doctor is about €80.000 a year, the total potential cost savings are up to €750.000 a year, which equals about €62500 a month. This value analysis can be visualized as shown in the figure below.



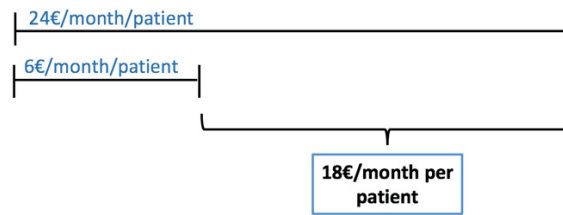
**Figure 42.** Value analysis for hospitals.

As shown in the figure above, hospitals would save an average of €62500 a month, which gives enough room for the case company to deliver high value to hospitals while capturing an interesting profit. Because Finnish healthcare regions have very different sizes and number of patients, it is interesting to analyze the value per patient provided by the case company product to each hospital. That way the value proposition would suit hospitals of any size.

$$2619 \text{ epilepsy patients per hospital}$$

$$62500/2619 = 24€/month \text{ per patient}$$

If the case company fee for hospitals would be 6€/month per patient, the value analysis would look like the one in the figure below.

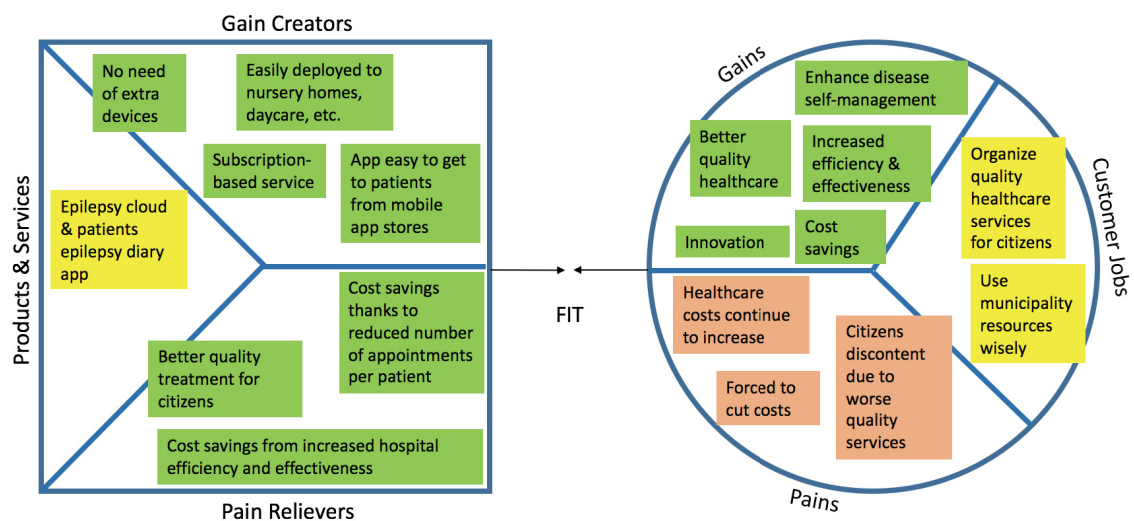


**Figure 43.** *Value analysis per patient for hospitals.*

As Figure 43 shows, the case company product can save about 18€/month per patient been monitored by the hospital.

## Municipalities

Next, the value proposition to target municipalities is built. The value proposition canvas for municipalities is presented in the figure below. Functional and emotional benefits are selected according to existing data gathered during the research process.



**Figure 44.** *Value proposition canvas for municipalities.*

Because municipalities are the payers of the healthcare services delivered to their citizens, they should be the maximum beneficiaries from any innovation aiming to reduce healthcare costs and improve its quality, which in turn bring more cost savings in the long-run. However, the value proposition for municipalities highly depends on cooperation with hospital districts for the actual realization of the potential cost savings promised by the case company.

Municipalities are billed for each appointment based on service package prices agreed each year between hospital districts and municipalities. The most direct economic impact the case company offering can bring comes from the reduction of unnecessary appointments, which can be realized thanks to enhancing remote patient monitoring and patient own cooperation. In addition to that, avoiding patient condition from worsening thanks

to real-time monitoring also reduces the number of incidences in which patients need ER services, hospital admissions or nursery homes admissions. All those services are paid by the municipalities.

Finnish hospital districts bill municipalities following the NordDRG (Nordic Diagnosis-related group) system, however, each hospital district's hospital has its own DRG codes and prices. All services delivered to a patient are marked in the patient's record. Later the services are translated into DRG codes, for which there are specific prices agreed each year. Finally, municipalities are billed all those DRG prices of the services delivered to their own citizens. Table 11 presents the prices of basic neurology appointments and phone/letter consultations for adult and child patients in different Finnish hospital districts.

**Table 11.** Neurology basic appointment and phone/letter consultation prices in 2016-2017 (based on official hospital district's price lists 2016-2017).

Hospital district	Adult appointment	Adult call consultation	Pediatric appointment	Pediatric call consultation
Etelä Karjala	199	60	229	60-92
Pohjois Pohjanmaa	215-348	49-161	451	101-144
Satakunta	120	55	430	55
Pirkanmaa	240	76	192-367	76
Helsinki and Uusimaa	170-340	140-240	360-540	240
Pohjois Savo	142-213	102	358	102
Etelä Savo	166	55	430	55
Vaasa	191-319	139	418-696	139
Kymenlaakso	126	43	211	124
Päijät Häme	211	35	361	35
Etelä Pohjanmaa	112	32	449	74
Keski Suomi	--	109	420	109

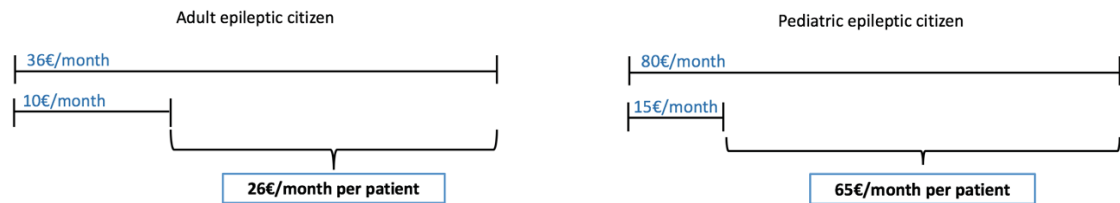
As it can be seen in the table above, the prices for similar services greatly vary for different hospital districts. The economic value potential of the case company offering will be estimated for a municipality served by the Etelä Savo district hospital.

If thanks to using the case company product, at least two unnecessary appointments and two phone consultations could be reduced per patient per year, the total amount of value created per patient per year is

$$(166 \times 2) + (55 \times 2) = 442\text{€ per adult patient a year} \approx 36\text{€/month}$$

$$(430 \times 2) + (55 \times 2) = 970\text{€ per pediatric patient a year} \approx 80\text{€/month}$$

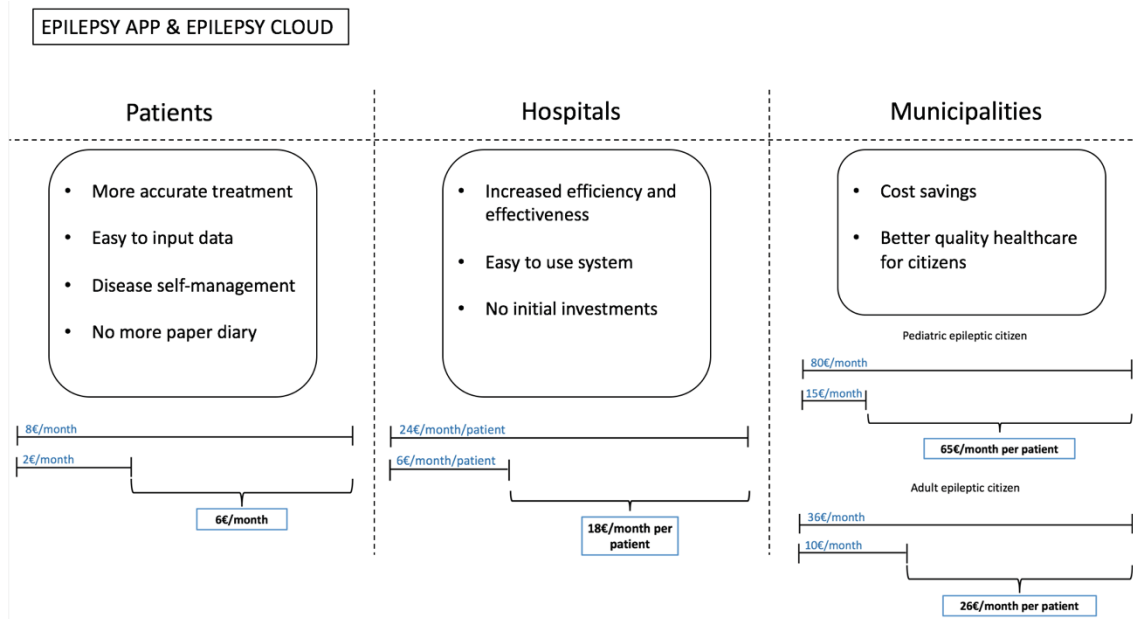
Thus, the total value created is about 36€/month for each municipality adult epileptic citizen and about 80€/month for each pediatric epileptic citizen. If the case company fees for municipalities are 10€/month per adult patient and 15€/month per pediatric patient, the resulting value analysis are visualized in the figure below.



**Figure 45.** Value analysis per patient for municipalities.

The value perceived by municipalities is 26€/month per adult epileptic citizen and 65€/month per pediatric epileptic citizen. However, despite that the case company offering provides cost savings to municipalities by reducing the number of appointments and phone consultations patients need every year, it is worth noticing that some labor is needed to operate the new system. Thus, the municipalities will be billed based on these new services. Nevertheless, thanks to improved efficiency and the possibility to remotely care for the patients, the amount of labor needed will be less compared to the current situation, therefore the prices for those services should be considerably lower compared to the current prices for face-to-face appointments and phone consultations.

It is important to notice that, based on the service fees shown in Table 11, the value created from pediatric patients is much higher than that of adults. Therefore, it should be easier to demonstrate the economic value of the case company solution when used to manage pediatric patients, and it should be easier to capture value for the case company. In conclusion, pediatric neurology units should be prioritized over adults' ones. The value proposition proposal is finally summarized in the figure below.



**Figure 46.** Value proposition proposal.

The few most critical points and explicit analysis of the economic value is shown for each stakeholder group. Thanks to this value proposition, stakeholders do not need to be overwhelmed by endless lists of benefits. Instead, they can see which are the benefits which satisfy their needs. In this way, the value proposition can be built so that the stakeholder cannot decline to try the system. Also, it justifies that the supplier retains a part of the created value in exchange for the value delivered to each stakeholder.

This section presented different value propositions customized to satisfy the needs of the three most relevant stakeholders for the case company: patients, district hospitals and municipalities. At this point the value propositions are based on qualitative data gathered by the author via observations during informative sessions with hospital districts nurses and managers, existing material obtained from hospital districts', government official sources and case company, and action science from brainstorming and workshops with case company representatives.

## 7. DISCUSSION AND LESSONS LEARNT

### 7.1 Overview of the Problem and Framework

The public healthcare system of many developed countries is constantly under cost reduction pressures (Myllärniemi & Helander 2012) due to the increasing amount of aging population (Härkönen et al. 2010) and the increment of chronic disease cases (Kujala et al. 2006; Finnish National Institute for Health and Welfare 2016). On the other hand, the quality of the healthcare services should not be compromised with cost reduction strategies that end up causing cost increments in the long run. (Teperi et al. 2009) Instead, governments should aim to innovative with the purpose of finding ways to improve healthcare quality while costs are reduced. One way to do this is to embrace a digital strategy consisting on healthcare ICT systems and innovations aiming to increase efficiency and effectiveness.

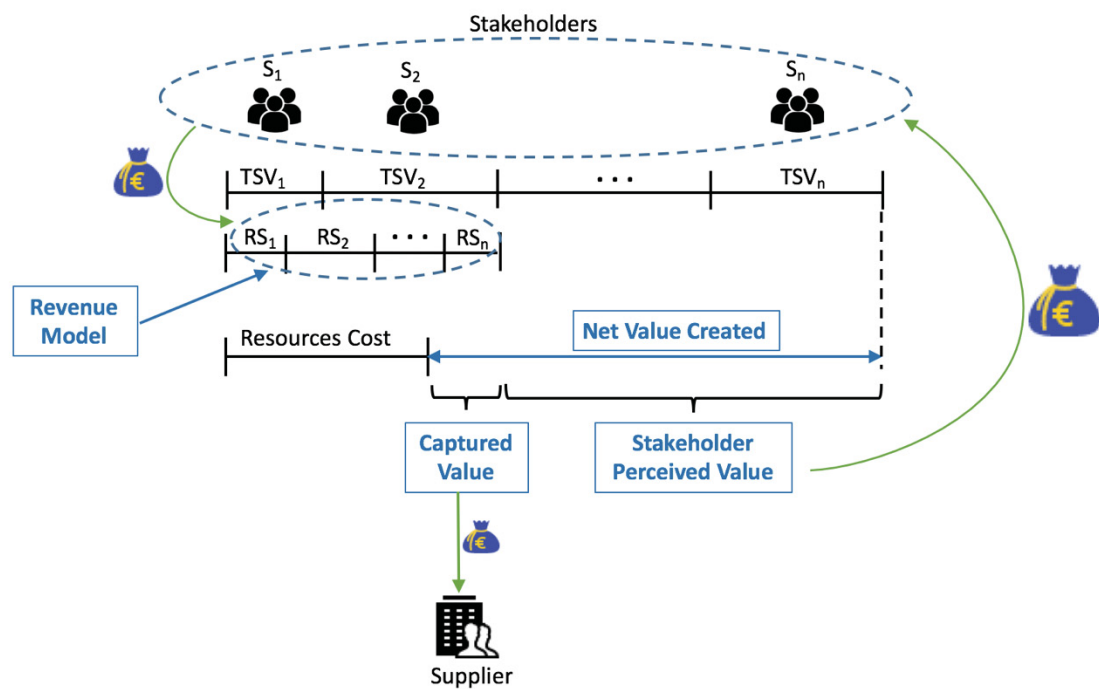
Among other industries, healthcare has already profited extensively thanks to the development of ICT (Viitanen et al. 2011). It is estimated that ICT helps offering healthcare that is safer, more responsive to patients' needs, and at the same time more efficient (Hyppönen et al. 2014). Today, large amounts of ICT systems are used in healthcare organizations to assist physicians and other healthcare professionals in their daily work with patients (Viitanen et al. 2011; Hyppönen et al. 2014).

In addition to improvements due to progress in different fields of clinical research and medical technology, innovations related to the organization of care delivery have great potential to drive improvement in value. Particularly in Finland, service delivery innovations have been recognized as one of the key performance drivers of the healthcare system. (Teperi et al. 2009) However, healthcare continues to be a quite traditional industry as it can be deduced from clinicians' critical attitude towards the adoption and usefulness of healthcare IT systems (Martikainen et al. 2012). Tight budgets in the public healthcare system does not help the situation.

The case company offers digital solutions for epilepsy patients and epilepsy related healthcare organizations. The case company has developed an ICT system which allows patients to report seizure data in real time, allowing medical staff to easily monitor all the patients under their care. Patients can easily enter new seizures' data through their smart phones, whereas healthcare professionals can access the patients' seizure data in a more convenient visual form. Thanks to this system, the inconvenient, error-prompt and time demanding task of manually processing traditional paper epilepsy diaries can be avoided, allowing medical staff to concentrate in more important activities, thus obtaining important cost savings.



Public healthcare systems are complex value networks consisting of a variety of stakeholders with rather different interests and motivation. In that context, this thesis suggests that healthcare ICT providers need to build value propositions that accurately target the needs of each stakeholder group, avoiding overwhelming them with long lists of benefits that do not really concern them directly. Such custom value propositions must show evidence of the economic value the product delivers to each stakeholder group. Only then, those stakeholders will be willing to take those innovations into use and the ICT providers will be able to capture value from a variety of satisfied stakeholders. Figure 47 illustrates the framework presented in this thesis.

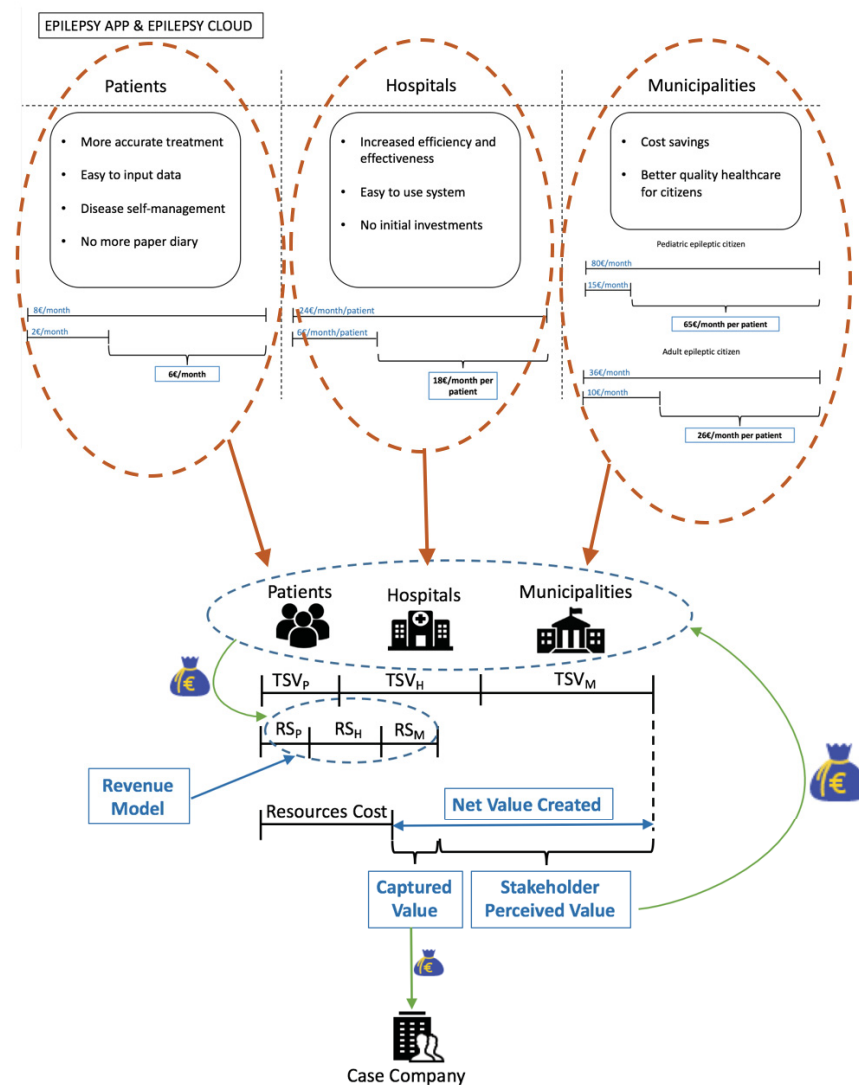


*Figure 47. Framework of the thesis.*

Chapters 2 and 3 presented the concepts based on which the theoretical framework is built: value proposition and revenue model. It is fundamental to understand the importance of value propositions and the nature of the customer value concept, which are the pillars that explain the importance of the fit between firms' offerings and customers' needs. However, business networks in which firms operate can be quite complex due to the existence of different stakeholders. Chapter 4 presented an overview of the stakeholder theory and shows how the theoretical framework is built based on the concepts presented in previous chapters.

## 7.2 Reflection of the Case in Framework

As mentioned in the previous chapter, the case company's current value proposition mostly highlights the functional benefits the case company's product offers. But, evidence based on gathered empirical data shows that presenting the economic value of the offering to the stakeholders and demonstrating it, is crucial for the success of the value proposition. Based on these findings, a value proposition proposal which highlights the economic benefits and targets patients, municipalities and hospitals separately was presented in Chapter 6. The proposed value proposition was built based on cost analyses for patients, hospitals and municipalities. The case company product creates value for all those stakeholders by providing them with cost savings, generated thanks to the use of the product to deal with all epilepsy diary-related tasks. The idea is shown in the figure below.

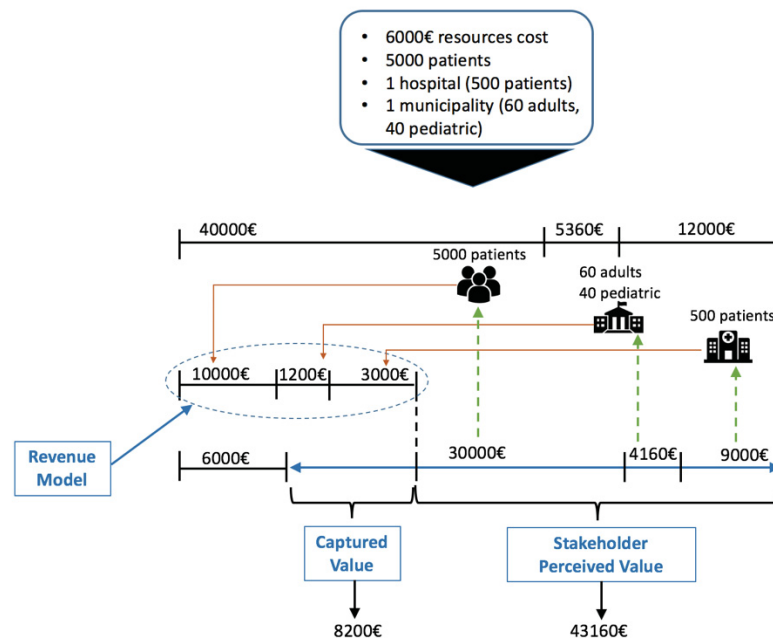


*Figure 48. Application of the framework.*

Using the values calculated for the value proposition, and a simplified scenario, it is possible to apply the framework and get concrete results. The simple scenario under analysis is described by the list below.

- Case company resources cost of 6000€/month
- 5000 epileptic patients
- 1 hospital with 500 epileptic patients
- 1 municipality with 60 adult epileptic citizens and 40 pediatric epileptic citizens

Figure 49 presents the application of the framework for the scenario described above. The total stakeholder values are calculated for patients, hospitals and municipalities. Similarly, the value of the revenue streams from the different stakeholders are calculated. Finally, stakeholder perceived values and case company's value capture are calculated.



**Figure 49.** Application of the framework for a specific scenario.

As shown in Figure 49, value propositions for patients, hospitals and municipalities can be used by to justify value appropriation and sustain a revenue model consisting on several revenue streams. If the case company generates €43160/month for the stakeholders, it is justified the case company would capture €8200/month. The next step would be to test the validity of the framework, for example, by employing data gathered from real implementations of the case company system (e.g. with data from pilot projects).

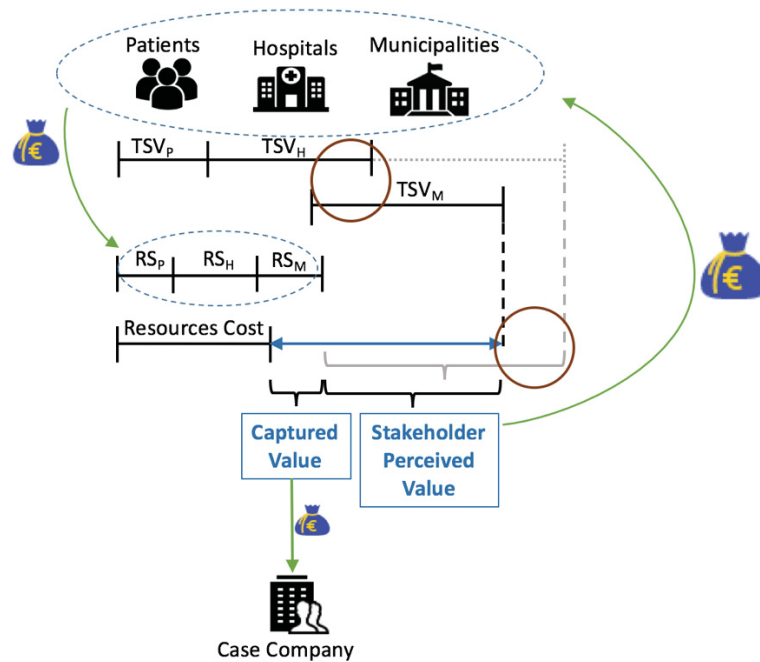
### 7.3 Analysis of the Case Based on Framework

The theoretical framework proposed in this thesis aims to explain how value propositions can be used as a tool to justify value capture from different stakeholders who simultaneously benefit from a product.

In the case under study, the case company's role is to be the provider of IT solutions for epilepsy-related stakeholders that could benefit from the solutions. More accurately, the case company offers a system to remotely monitor patient seizure data, which consists of a mobile app for the patients and their caretakers to input seizure data, the epilepsy cloud where the seizure data is safely stored and accessible to patients and healthcare professionals, and the healthcare professionals' seizure management application, which gives treating doctors and nurses access to patient data, plus statistics, visuals and other value-adding features. Three most relevant stakeholders benefiting from the system were analyzed: patients, hospitals and municipalities.

Cost savings generated from the use of the case company product were estimated for the selected stakeholders (patients, hospitals, municipalities). Based on those cost savings, the economic value part of the value proposition for each of the selected stakeholders was built. Functional and emotional benefits' selection was based on empirical data gathered during the research. The validity of the value proposition for patients and hospitals was tested during a one year pilot done at one district hospital for 14 adult patients. However, data to calculate the economic benefit of the solution was not gathered during the pilot. Therefore, the economic benefit has not been proved, and in turn, value capture has not been justified yet.

One interesting aspect of this case study is the role of the municipality and its relationship with the hospitals. Municipalities are not users of the case company product, however, when patients and hospital districts take the product into use, healthcare cost of epileptic citizens decreases. The benefits achieved should reach the municipalities as they are the payers. Each appointment reduced thanks to the use of the case company product is a direct saving for the municipality where that patient resides. Therefore, the value proposition proposed in Chapter 6 suggests that municipalities should be eager to be involved and to support the initiative. Finally, because of the way funds flow from tax payers to municipalities, and from there to hospital districts, it is inaccurate to describe the total value created by the case company as the sum of the value created for patients, hospitals and municipalities. In reality, municipalities fund hospital districts, therefore, part of the savings generated for municipalities overlap with those of hospital districts. Thus, for the specific case of the Finnish healthcare system stakeholders, the framework behaves as it is described in the figure below.



**Figure 50.** *Value created for hospital and municipality overlaps.*

The total stakeholder value created is lower, as Figure 50 reveals. If the case company captured value remains the same, the stakeholder perceived value is lower as well, as it can be deduced from the figure above.

## 7.4 Analysis of the Results

The study carried out in this thesis showed the important role of value propositions in showing to different stakeholders the value the proposed solutions will create for them. Empirical data confirmed that value must be demonstrated, that is, it must be perceived by the target stakeholder. To be able to realize their value promises, allows suppliers to stand out from competitors and to justify their value capture intentions.

A value proposition to target different stakeholders was built based on the empirical data gathered during the research process. The ability of the value proposition to highlight the most important pain relievers the case company solves for each target stakeholder seems to be the key to get each of those stakeholders interested in the product. Then, a deep analysis of the economic value that will be perceived by each stakeholder, followed by evidence of such value (e.g. pilot project results) proved to be a powerful and decisive mechanism to reach successful sales, thus accomplishing the critical task of justifying the prices at the price list.

However, the data gathered by one pilot project organized with one district hospital only proved the functional and emotional benefits of the product. For that reason, it has been

planned that future pilot projects will have as one of their main objectives to demonstrate the economic value given by the system. Past data regarding healthcare costs of each patient participating in the pilot will be collected. The collected data will at least include: number of appointments per year, duration of the appointments, number of calls per year, duration of the calls, consultations related to the calls, examinations and other tests per year. During the pilot, similar data will be collected per in a monthly basis. Later, past data and data during the pilot will be compared to calculate the monthly economic benefit per patient.

Another result of this thesis is the importance of analyzing the different stakeholders involved in the value network, specially those who benefit from the company's products. Understanding the interests and motivations of different stakeholders is key to developing favorable revenue models. This is especially true for IT suppliers: once R&D costs are covered, production costs due to serving one more customer type are moderated, whereas the establishment of a new revenue stream can have important positive consequences for the company. Therefore, the identification of potential stakeholders that benefit from the company's solution and the subsequent development of value propositions around those benefits proves to be a valid strategy to develop revenue models composed of a variety of revenue sources.

The empirical study also revealed that the complexity of the value network around the company's products, and the degree of intertwinement of the stakeholders' relationships play a significant role, greatly affecting the ease and success of suppliers' sales efforts. The case study showed that, even though the municipalities would receive the highest economic value, the way the healthcare system is organized in Finland makes difficult for the case company to deliver such value to the municipalities. Municipalities cannot realize the value unless patients and hospitals commit to the solution. On top of that, hospitals together with municipalities would need to define new services around case company solution and renegotiate services fees for the new services.

Finally, the niche that the case company intends to serve might be too narrow, with about 55000 epileptic patients in Finland. To organically grow, the company could expand geographically. However, that seems a risky and expensive move for a start-up. The researcher found out that there are other neurologic disorders (e.g. migraine) that require patients to keep diaries like the epilepsy diaries discussed in this thesis. If the system could easily be modified to support other neurologic disorders, the potential would be higher. Moreover, hospital's neurology units would be better served than if they are only provided with such a system for their epilepsy patients, but must continue to handle paper diaries for patients of other diseases. By better satisfying neurology units' needs, more interested and motivated they will be to subscribe to the service.

## 8. CONCLUSIONS

The public healthcare system of many developed countries is constantly under pressure (Myllärniemi & Helander 2012) due to the increasing amount of aging population (Härkönen et al. 2010) and the increment of chronic disease cases (Kujala et al. 2006; Finnish National Institute for Health and Welfare 2016). Embracing a digital strategy to deliver quality healthcare services, while increasing the efficiency and effectiveness of the healthcare organizations is the solutions taken by many governments. The rapid proliferation of technological startups offering a variety of products and services that promise to boost their customers' organizations efficiency and effectiveness has lately contributed to the increase of competitiveness in the sector. As a result, customer have become more demanding than ever, especially when it comes to the point of evaluating suppliers' offerings and deciding which investments are more likely to break even while making the organization more competitive at the same time.

The objective of this study was to analyze the role of value propositions as a tool to justify value capture from different stakeholders benefiting simultaneously from a firm's products and services. To achieve the objective, the thesis focuses on the concepts of value proposition, revenue model and stakeholder. Those concepts serve as a starting point for building the theoretical framework proposed in this thesis. The framework aims to use value propositions to justify value appropriation by a focal company from different stakeholders which simultaneously benefit from the focal company's offering. Finally, a value proposition for the case company was built and the framework was tested.

This thesis has three key findings. First, qualitative data proved the importance of understanding that customer value must be perceived by the customer, that is, it must be experienced by the customer in order to confirm that the supplier's promises come true. Second, in cost-conscious environments (e.g. public sector) the economic benefits of the offerings must be prioritized as those are the ones helping to close deals. Therefore, pilot projects should focus on collecting enough data that helps demonstrating the economic benefits of the solution being tested. Third, the effect of phenomena such as organizational culture, bureaucracy, resistance to change and value network complexity is often underestimated when planning new ICT innovations marketing. Perception of the product's value may be hindered by those factors.



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