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UNIVERSITY OF TWENTE.

Optimizing the Perceived Value-in-Use of Integrated Software Solutions in a B2B Context

A Case Study on the Social Domain of Dutch Local Governments

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Management Summary

The Dutch welfare state system is financially unsustainable in the long run and calls for change. Therefore, previously central government tasks in the field of *WMO*, *Jeugdwet* and *Participatiewet* have been decentralized to local governments in 2015. This means that today, municipalities are responsible for youth care, employment & income, people suffering from long-term illness, and elderly people. In fact, it is a transformation from the welfare state system towards a system in which every citizen contributes and becomes more responsible for taking care of their own welfare and of those people surrounding them. Thereby the local governments take a facilitating role in connecting the ecosystem members. The transition requires municipalities to develop new processes and adjust their existing processes towards it, along with more intensive collaboration among municipalities and institutions in the social domain. An integrated software solution that connects the chain partners and allows centralized documentation would support municipalities to efficiently and effectively manage their new tasks and responsibilities.

Following Service-Dominant Logic, a supplier should develop a thorough understanding of customer perceived value-in-use of software solutions and find strategies to optimize value-in-use, in order to be superior to competitors. As this research focuses on the organizational level of value-in-use, the value-in-use perceived by the customer organization (the municipality) is studied. The research objective of this study is threefold: (1) synthesize the current state of knowledge on value creation and value-in-use in the software industry, (2) provide insights on which factors influence the value-in-use of software solutions, and (3) how software suppliers could use value propositions to optimize the perceived value-in-use of their products and services within the social domain of Dutch local governments. This led to the following central research question: *How can suppliers optimize the perceived value-in-use of integrated software solutions by customer organizations within the social domain of Dutch local governments?*

Based on an extensive literature review and a case study at a Dutch software supplier organization consisting of 17 interviews, the concept of value-in-use has been defined and explained and the following six factors influential to value-in-use have been identified: (1) service and product quality, (2) implementation process, (3) customer usage process, (4) customer-supplier relationship, (5) business ecosystem, and (6) competitors and substitutes. Furthermore, a conceptual model has been derived from the six influential factors which also elucidates the different roles of supplier and customer in the value creation process. Overall, customers tend to view the customer usage process, product quality and business ecosystem to

be of higher influence on value-in-use, while suppliers tend to view the service quality, implementation process and the customer-supplier relationship to be of higher influence on customer perceived value-in-use. Finally, three different municipality types based on attitude towards the decentralization and resulting coping strategy have been identified, which are proactive standalone municipalities, municipal cooperations, and reactive municipalities. The attitude and response strategy tend to be largely determined by (1) municipality size and available budget, (2) degree to which municipalities are challenged by the new tasks and responsibilities in the social domain, and (3) incentive to excel and willingness to change and innovate.

As a piece of management advice, the results of this study highlight that managers should be aware that, by definition, the customer is in charge of the value creation process during usage of the software solution, and that the supplier organization only has limited influence on this process. Furthermore, managers should focus on the aspects of value-in-use that customers consider to be most influential, which are the customer usage process, product quality and the functionality of the business ecosystem. Although the supplier cannot directly control the customer usage process or the business ecosystem, it can do its best to facilitate the customer to achieve the optimal outcomes out of it. This could for example be done by offering a very intuitive software design which guides the users through clearly defined process stages. Concerning the business ecosystem, the supplier could take initiative to set up more collaborations among chain partners in the social domain or bring (potential) chain partners together in information meetings or events. In addition, managers should recognize the different needs of different types of customer organizations and adjust their value propositions in a way suitable for each type of municipality in order to optimize the respective value-in-use. To illustrate, for proactive standalone municipalities, the value proposition could be more appealing to customers if it contains the opportunity of collaboration, co-creation and innovation. Reactive municipalities are more internally focused organizations and are likely more attracted by value propositions that focus on software solution quality and service quality. The municipal cooperations cooperate with peers and probably favor value propositions containing the possibility of easy establishment of connections with other (existing) software systems, along with product and service quality.

Foreword

This thesis, “*Optimizing the perceived value-in-use of integrated software solutions in a B2B context*”, is written as a graduation assignment of the Master of Science in Business Administration at the University of Twente in Enschede. The report starts off with an extensive literature review on the concepts of value-in-use and the co-creation of value. Based on a single-case study at a supplier of software solutions, it is assessed how customers experience the value-in-use of software solutions and how software suppliers can use value propositions to optimize the customer perceived value-in-use of software solutions within the social domain of Dutch local governments.

This research has been conducted in collaboration with software supplier Topicus Overheid BV, Enschede. During the entire research process, I have received guidance and support from multiple employees at Topicus Overheid all of whom I want to extend my sincere gratitude. In particular, I would like to thank Frank Helmich and Harald Dannenberg who supervised me throughout the process.

During the research process, I also received guidance from my supervisor, Michel Ehrenhard, from the University of Twente. I would like to especially thank Michel Ehrenhard for all help and guidance, but also for the tips and interesting ideas he shared with me. I would also like to thank my assessor, Raymond Loohuis, for his guidance and support throughout the entire graduation process.

A substantial part of the research is based on interviews with Dutch local governments and employees of Topicus Overheid. In total, 17 in-depth interviews have been conducted. I greatly appreciate the time and effort spent to participate in the interviews as well as the open-mindedness and honest opinions the interviewees offered me. Therefore, I would also like to thank all interviewees for their great contribution to this thesis.

I hope you enjoy your reading.

Danique Sterenborg

Enschede, 24th of August 2017

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1. Introduction

1.1 Research Background

After World War II, the Netherlands created a welfare state system. In such a system, the state is responsible for the welfare of its citizens in terms of healthcare, social welfare, employment and income. The related costs are mainly covered through tax income. However, as the Dutch society is aging and birth rates decline, the taxable income from the workforce decreases. At the same time, costs rise due to higher life expectancies and corresponding increased demand in healthcare and social care over a longer time period. As a result, the Dutch welfare state system is financially unsustainable and thus calls for change (Ehrenhard, Muntslag & Wilderom, 2012). Therefore, a decentralization of government responsibilities to local governments has taken place (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2014). The decentralization in 2015 concerned the transition of *WMO*, *Jeugdwet* and *Participatiewet* to the social domain of Dutch local governments. This indicates that since 2015, Dutch local governments are responsible for youth care, employment & income, people suffering from long-term illness, and elderly people (Rijksoverheid, 2017). The objective of the decentralization is to save costs while maintaining the level of society's welfare by appealing on selfreliance and participation of citizens in society. Therefore, each municipality receives a budget from the Dutch government, and is responsible for the allocation and spending of the budget.

At the time the social domain was under the government's control, persons or families with complex problems (so called "*multi-problem families*") had to cooperate with a number of different organizations in order to receive the help and support they needed. Accordingly, at each organization they also had to explain their problems anew and deal with registrations and formalities. This puts an additional pressure of rules and regulations on these people. The decentralization aims at reducing the pressure of rules and regulations for citizens with complex problems by providing a single point of contact for all issues they are dealing with within the boundaries of the social domain. This is summarized in the phrase "*I family, I plan, I supervisor*" which means that – in each case where there are issues in social, health or financial matters – there should be a plan on a family level which is supervised by one professional and his/her team (Rijksoverheid, 2017). In sum, the decentralization concerns a transformation from the traditional Dutch welfare state system towards a system in which

every citizen contributes and becomes more responsible for taking care of their own welfare and of those people surrounding them. Thereby, the Dutch local governments take a facilitating role in connecting the ecosystem members.

In fact, the Netherlands is not the only country that is redefining government tasks and responsibilities. Governments from all over the world are looking for ways to better support citizen and reduce costs while at the same time stimulating innovation in order to spur economic growth. It challenges governments to engage stakeholders and solve societal problems by utilizing new methods, practices and new government models. A trend arises towards so-called *lean governments*, which aims at reducing the complexity of the public sector by simplifying and streamlining organizational structures and processes, while at the same time stimulating innovation by mobilizing stakeholders (Janssen & Estevez, 2013; Ehrenhard et al., 2012).

However, the new tasks and responsibilities in healthcare, welfare, employment and income, combined with a pressure to reduce costs, initially forms a challenge to Dutch local governments. In order to fulfil these new tasks and responsibilities, local governments have to develop new processes and adjust their existing processes towards it. This translates into more active participation of citizens and local governments operating more closely to their citizens as facilitators (Wijnhoven, Ehrenhard & Kuhn, 2015). For example, with local district teams of social workers who support households that face problems in upbringing their children or in financial matters. As a result, some previously back office tasks, such as the allocation of social care or healthcare, will become front office tasks performed by the local district teams. Some processes may be outsourced, and local governments will likely cooperate on a regional level for procurement to save costs. Furthermore, overall operating efficiency has to be increased due to the tight set budgets that are made available by the government.

In order to achieve higher efficiency, the entire chain of institutions and organizations in the social domain has to cooperate more closely and needs to be better connected. Managing these changes successfully requires software that supports the new systems and processes. As a result, the decentralization means a new business opportunity for software suppliers. Software suppliers can extend their existing customer base and increase sales by developing software solutions that help Dutch local governments manage their new tasks and responsibilities more easily while integrating the chain to reach higher efficiently levels and better collaboration. However, in order to know how to deliver software of superior value to its customers and create competitive advantage over its competitors, it is essential for

software suppliers to develop a thorough understanding of the concept of value-in-use and how value propositions can be used to optimize customer perceived value-in-use of software solutions in the social domain of Dutch local governments.

1.2 Research Objective and Research Questions

The research objective of this study is threefold: (1) synthesize the current state of knowledge on value creation and value-in-use in the software industry, (2) provide insights on which factors influence the value-in-use of software solutions, and (3) how software suppliers could use value propositions to optimize the perceived value-in-use of their products and services within the social domain of Dutch local governments.

Central Research Question:

How can suppliers optimize the perceived value-in-use of integrated software solutions by customer organizations within the social domain of Dutch local governments?

Subquestions:

1. *What is the value-in-use of integrated software solutions within the social domain of local governments in the Netherlands?*
 - a. *How do customers view value-in-use of software solutions?*
 - b. *How do suppliers of software solutions view customer perceived value-in-use?*
2. *Which factors influence the customer perceived value-in-use of software solutions?*
3. *How can software solution suppliers adjust their value propositions in order to optimize the perceived value-in-use?*

1.3 Research Approach

As a foundation to this research, a systematic literature review on the concepts of value creation and value-in-use has been conducted through the lens of the Service-Dominant Logic. In order to gain a more holistic understanding of how value is being created and how value-in-use arises, a single-case study is undertaken at the Dutch software supplier Topicus Overheid, which provides chain-integrating software solutions for the social domain of Dutch local governments. Furthermore, it was chosen to study value-in-use on an organizational level, and thus, a focus was drawn to the supplier-customer relationship. Based on the

knowledge gained from the literature review, factors that are influential to value-in-use are identified and propositions are formulated. Based on the findings from the theoretical framework, the concept of value-in-use and its influential

1 factors have been discussed in 17 semi-structured interviews with (1) Topicus Overheid's customers, which are employees (e.g. information manager, functional IT analyst or IT consultant) at Dutch municipalities, as well as (2) employees of different professional expertise of Topicus Overheid. Based on the case study results, the propositions formulated in the theoretical framework have been confirmed, adjusted, or rejected. Furthermore, a conceptual model of the factors influential to customer perceived value-in-use has been developed, three different types of municipalities have been identified, and suggestions are given with respect to the value propositions for the different municipality types.



1.7 Case Study Organization: Topicus

Topicus is an innovative Dutch software supplier that is founded in 1998 and has more than 700 employees. The company has offices in Amsterdam, Leiden, Deventer, Zwolle, Groningen and Enschede. Topicus offers software solutions for four different sectors: Education, Healthcare, Finance, Government, and Legal. Topicus is known for its focus on chain integration, use of SaaS applications, and desire to deliver smart software solutions to today's fast-changing economy that improve the lives of citizens and society as a whole. In particular, Topicus strives for improving education, increasing transparency in finance, better access to healthcare and healthy relationships of citizens with their local governments. Therefore, Topicus designs software solutions that enhance citizens ability of control and also provides citizens the opportunity to increase selfreliance (Topicus, 2017). The Government division, Topicus Overheid, is the case study organization that is being studied in this research.

According to Topicus' view, institutions and organizations are not stand-alone entities. Rather, they are part of a whole chain. Based on its accumulated knowledge and experience in software, Topicus integrates institutional and organizational chains in order to improve its functionality and better fulfil the desirabilities and needs of chain stakeholders. Optimizing

the exchange of information among the entire chain by using smart software solutions is what Topicus aims to do (Topicus, 2017).

Topicus offers most of its software solutions in form of Software-as-a-Service (SaaS), also known as Software on Demand. SaaS is a type of cloud computing service delivery model (Marston et al., 2011). With SaaS, the client has on-demand access to the software applications they need on a cloud infrastructure via a web browser. The cloud infrastructure including the network, servers, operating systems and the application software is hosted by the supplier (Chou, 2015). This eliminates the need to install and run the application on the client's hardware (Marston et al., 2011). Basically, the client only subscribes for an application without the need to buy, install and maintain the software. The supplier assures quality of service as the supplier is the responsible party for the maintenance, application upgrades and backups of the software services (Yang et al., 2015). Examples of SaaS include Google Apps and Salesforce.com (Laudon & Laudon, 2012).

Topicus has demonstrated to be a reliable and solid partner in the field of software solutions. A few examples to illustrate:

- Over 4200 schools use the ParnaSys system for primary education
- Topicus organizes the declarations for over 4000 general practitioners
- The digital dossier JGZ (KD+) has a market share of 40%
- Incumbent banks such as ING and Rabobank use software of Topicus for mortgages and credits



In response to the decentralization of WMO, Jeugdwet and Participatiewet in 2015 (Rijksoverheid, 2017), Topicus launched the Government division (Topicus Overheid). This division currently has about 35 employees and is located in Enschede. Topicus Overheid developed the Topicus Overheid Platform, shortly TOP, which assists Dutch local governments to perform their new tasks in the social domain. TOP delivers software for the entire process of intake to making support plans, including the procurement of healthcare from providers and handling declarations. TOP enables information sharing among all organizations, institutions, and persons involved while ensuring a secured exchange of

information. In addition, TOP increases the automatization of processes and lowers the burden of administration (no more double administration), which in turn enables a better and faster handling of processes. In addition, Topicus easily makes connections with other (existing) systems of other suppliers whom – based on degree of authorization – can also work in the integral system. To date, TOP is implemented at over 60 Dutch local governments of different sizes and spread across the entire nation. Figure 1 below shows a conceptualization of how TOP integrates the chain in the social domain of local governments. As can be derived from the figure, the main stakeholders are Dutch citizen, local district teams of social workers, healthcare providers, local government employees, Topicus' software engineers, as well as the social network of the citizen in question.

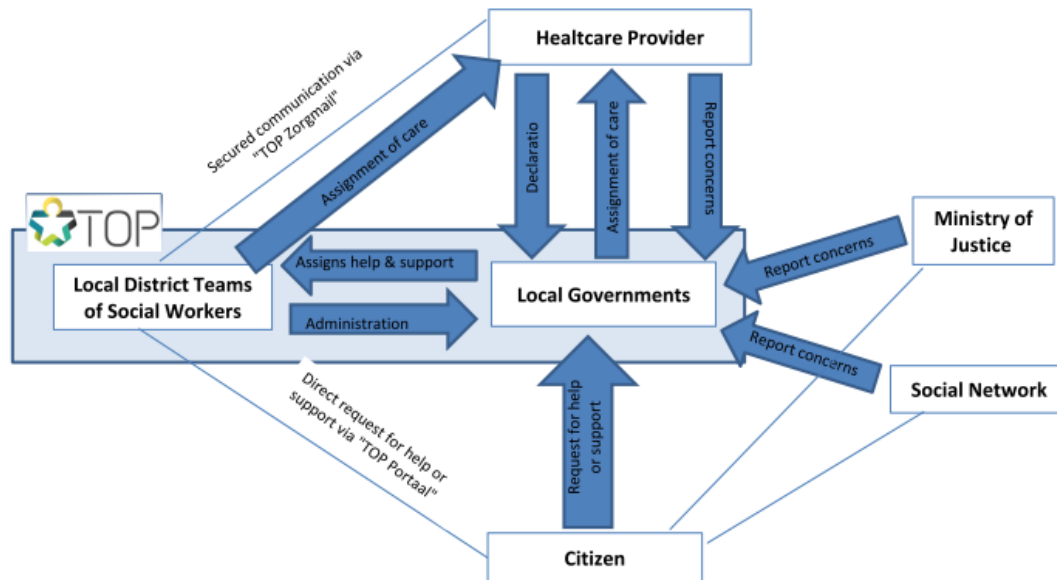


Figure 1: Software Solution TOP Integrates the Chain within the Social Domain of Local Governments.

1.8 Academic Relevance

This exploratory and empirical study contributes to the academic field of research into value-in-use and customer perceptions of software solutions in a B2B setting. In prior research, value-in-use is usually discussed at an abstract level, while empirical investigations on software solutions from a customer perspective are scant. As recognized by Jaakkola & Hakanen (2013), much of the research in the field of solutions relies on suppliers' perceptions of the value that could be accrued by customers, rather than investigations based on the

customers' actual value perception (i.e. Vargo & Lusch, 2004; 2008) or experience of value (Schembri, 2006; Helkkula, Kelleher & Pihlström, 2012). Throughout an extensive literature review of recent articles published in top-tier scientific journals about the topics of value-in-use, co-creation of value, and S-D logic, the current state-of-the-art in this research field has been synthesized. Furthermore, the literature review reveals several factors (see section 2.5) that are related to customer perceived value-in-use. However, none of the reviewed studies covers all factors identified in the current research, and besides that, the studies originate from different contexts, industries and nations (e.g. customer solutions or manufacturing; a study conducted in China). The contribution of this study is threefold. First, all identified factors in literature related to customer perceived value-in-use have been synthesized. Second, the existence and importance of the identified factors influential to customer perceived value-in-use of software solutions has been empirically investigated. And third, to the researcher's best knowledge, this is the first empirical study on the value-in-use of software solutions from an organizational perspective in the specific context of local governments.

1.9 Practical Relevance

Besides the academic relevance, this study also carries practical relevance to suppliers of software solutions – and in particular to case study organization Topicus Overheid. As pointed out by Helander & Ulkuniemi (2012), high-technology industries have often been accused of being too engineering and technology driven during the development of new products and services, while paying insufficient attention to the customer experience. As a result, the supplier's perspective of customer perceived value-in-use of their products and services may significantly deviate from the customer's perspective and experience, ultimately leading to lower levels of customer satisfaction and a decreased competitive advantage (Gummerus, 2013). In addition, due to the complex and abstract nature of integrated software solutions, developing an understanding of customer needs might also be more challenging than in more traditional industries such as retail. The context-dependent nature of value has been emphasized in literature (e.g. Vargo, Maglio, & Akaka, 2008; Schembri, 2006; Edvardsson, Tronvoll & Gruber, 2011; Vargo & Lusch, 2016). By focusing on the software solutions industry within the context of the social domain of Dutch local governments, this study especially provides useful insights for managers within this specific domain, and likely also to software supplying organizations in general. This study offers managers the insights necessary to develop a greater understanding of customer perceived value-in-use of software

solutions, and delivers suggestions how value propositions can be adjusted in order to enhance the customer perceived value-in-use.

1.10 Outline of the Thesis

The thesis is structured as follows. **Chapter 1** concerns the Introduction, wherein the background to the research, research objective and research questions, research approach, a case study organization description, as well as the academic and practical relevance of the study are given. In **Chapter 2**, the Theoretical Framework is presented covering the topics of (1) value terminology and concepts, (2) service-dominant logic, (3) value-in-use, and (4) customer solutions and value creation in business ecosystems. **Chapter 3** is about the Methodology and describes the research design, the methods applied for data collection and data analysis, as well as how and why the interview participants have been selected. Subsequently, in **Chapter 4**, the Results are discussed and the propositions formulated in the theoretical framework are revisited. Finally, in **Chapter 5**, the Conclusion is presented along with managerial implications, limitations of the research, and suggestions for future research.

2. Theoretical Framework

2.1 Ambiguity of Value Terminology and Concepts

“The primary pursuit of business is creating and maintaining value” (Sirmon, Hitt, & Ireland, 2007, p. 273). This makes value an important factor in corporate decision-making, especially because managers, in general, tend to undertake or invest in projects that yield maximization of customer value (Chou, 2015; Gummerus, 2013). So, understanding what value is and which processes are underlying value creation is essential for managers. Furthermore, due to its importance in business, value creation is a central concept in management and organizational literature. As such, one would assume that value creation is a well-understood concept to both managers and researchers. However, this is not the case. In marketing literature, there is no consensus and several competing conceptualizations of customer value exist (Gummerus, 2013; Lepak, Smith & Taylor, 2007). Also, many published studies take the abstract concept of (business) value for granted and do not investigate how it is defined, used across different industries or how it is measured. As a result, the concept of value is applied and measured in many different ways. For instance, some studies use return on investment as a measurement of value, whereas others measure value through the aspect of perceived customer value (Alahyari, Svensson & Gorschek, 2017). The different conceptualizations of value can be traced to the heterogeneous nature of the parties or targets for which value is created as well as the potential sources or creators of value, both depending on the type of business being considered. Besides, value creation refers both to the content and process of new value creation (Lepak, Smith & Taylor, 2007).

Thus, value appears to be a rather complex construct which *“has been discussed and debated since Aristotle”* (Vargo, Maglio & Akaka, 2008, p. 146). In its traditional form, *value* is understood in terms of profit generation (Alahyari, Svensson & Gorschek, 2017). Similarly, Cronk and Fitzgerald (1999, p. 45) define value as the *“worth, desirability or utility of a thing”* and state that what constitutes a certain value for an individual depends on many different factors. Furthermore, Zeithaml (1988, p. 14) argues, *“value is the customer’s overall assessment of the utility of a product based on perceptions of what is received and what is given”*. In marketing literature, value is often conceptualized as the subjective perception of the trade-off between benefits and sacrifices – which might be both monetary and non-monetary (Ravald & Grönroos, 1996; Slater, 1997). Non-monetary benefits might include delivery time, personal interaction and service support, while non-monetary sacrifices can include effort, time and energy spent (Helander & Ulkuniemi, 2012).

Valuation, in turn, is an “*economic process that identifies the value of actions in an organization*” (Chou, 2015, p. 74). Bowman & Ambrosini (2000) argued that in an organizational context, value consists of two components, namely *perceived use value* and *exchange value*. First, perceived use value is determined by the customer based on their perceptions or experience regarding the usefulness or quality of the offered product or service in relation to their needs. Thus, use value is subjective and purchase decisions are based on the consumer’s expected surplus from the offering. The monetary value is the amount the customer is willing to pay for the product or service. Secondly, exchange value relates to the monetary amount realized at the point of sale for the perceived use value (Bowman & Ambrosini, 2000; Lepak, Smith & Taylor, 2007). This view implies that organizations create potential perceived use value and capture exchange value (Adner & Kapoor, 2010). Organizations that offer a higher expected consumer surplus of use value than its competitors – resulting in a higher willingness to pay – likely capture higher exchange values. These terms are also referred to as *value-in-exchange* and *value-in-use* in literature (Vargo and Lusch, 2004; 2006, Vargo, Maglio & Akaka, 2008; Ballantyne & Varey, 2006; Grönroos & Voima, 2013; Macdonald, Kleinaltenkamp & Wilson, 2016; Marcos-Cuevas et al., 2016).

Ritala et al. (2013, p. 5) propose the following definition of value creation: “*the collaborative processes and activities of creating value for customers and other stakeholders*”. Lepak, Smith & Taylor (2007, p. 182) argue that the two definitions of value – use value and exchange value – introduced by Bowman & Ambrosini (2000) in the previous section “*suggest that value creation depends on the relative amount of value that is subjectively realized by a target user (or buyer) who is the focus of value creation [...] and that this subjective value realization must at least translate into the user’s willingness to exchange a monetary amount for the value received*”. Furthermore, *value capture*, also referred to as *value appropriation*, refers to “*the individual firm-level actualised profit-taking; that is, how firms eventually pursue to reach their own competitive advantages and to reap related profits*” (Ritala et al., 2013, p. 5). Although value capture usually concerns an individual firm-related activity, it is also possible for firms to collaboratively capture value (Adner & Kapoor, 2010; Ritala et al., 2013). Adner and Kapoor (2010) argued that value creation precedes value capture. Moreover, following Lepak, Smith & Taylor (2007), value creation and value capture should be viewed as distinct processes, since the source that creates a value increment may or may not be able to capture the value in the long run. Instead, value created by one source or at one level of analysis might be captured at another, which is referred to as *value slippage*. For value creation activities to endure, two important economic

conditions may be necessary. First, the monetary amount exchanged must exceed the producer's resources spent – such as money, time, effort, etc. – of creating the value in question. Second, the monetary amount that a customer will exchange is based on the perceived performance difference between the new value that is created from the product or service at hand, and the customer's closest alternative. In general, without these excesses, neither the customer nor the creator of value would be inclined to repeatedly engage in these activities in the long run (Lepak, Smith & Taylor, 2007).

As indicated before, the concept of value is applied and measured in many different ways, and several attempts to create conceptualizations of value have emerged (Grönroos & Voima, 2013; Gummerus, 2013). Early studies tended to conceptualize value on an individual level by assessing value through (1) a Benefits-Sacrifice Framework in which the perceived customer value is determined by a trade-off of benefits and sacrifices or costs which a customer has to incur over time (Zeithaml, 1988; Slater 1997; Vargo & Lusch, 2004; Eggert & Ulaga, 2002), or (2) Means-Ends Models (Woodruff 1997; Gutman 1982; Zeithaml, 1988) wherein value is assessed in terms of product attributes and its consequences in use. In more recent studies, a shift can be observed towards a more holistic and experiential perspective that traces value in to customer experiences (e.g., Schembri, 2006; Payne et al, 2008; Heinonen et al., 2010; Helkkula et al, 2012; Grönroos & Voima, 2013; Ranjan & Read, 2016). Indeed, as pointed out by Helander & Ulkuniemi (2012, p. 27), the current understanding of value as a subjective construct based on customer perceived value, makes it very difficult to measure the created value since *“the value created by the supplier is in the end measured in the mind of the customer”*. This shift towards measuring value in terms of customer experiences appears to be in line with the paradigm shift from the goods-dominant logic towards the service-dominant logic, which will be described in the following section.

2.2 A Paradigm Shift: From Goods-Dominant Logic towards Service-Dominant Logic

Organizations are increasingly shifting from a goods-dominant logic (G-D logic) towards a service-dominant logic (S-D logic). These two logics differ in the way value and value creation is viewed. The traditional G-D logic refers to *‘value-in-exchange’* (Bowman & Ambrosini, 2000; Vargo & Lusch, 2004; Lepak, Smith & Taylor, 2007), and focuses on the exchange of *operand resources* (Constantin & Lusch, 1994; Vargo et al., 2008). Operand resources are *“resources on which an operation or act is performed to produce an effect”*

(Vargo & Lusch, 2004, p. 2), such as tangible goods. Differently, *operant resources* are resources “*which are employed to act on operand resources (and other operant resources)*” (Vargo & Lusch, 2004, p. 2). Operant resources are often invisible and intangible and produce effects, like knowledge and skills as well as organizational core competences or processes. Operant resources typically are dynamic and infinite, unlike operand resources which are static and finite. Since G-D logic considers operand resources as primary to the organization, and views operant resources (such as technology and services) as tools to convert operand resources into units of output, it assumes that value is embedded in products created and services performed by the firm (Vargo & Lusch, 2004; 2008; Vargo, Maglio & Akaka, 2008). Typically, these products and services are standardized and firms compete on price and economies of scale (Vargo & Lusch, 2008). From this traditional perspective, the roles of producers and customers are distinct and value creation occurs inside firm, assuming that the firm is in control of value creation (Grönroos & Voima, 2013). For example, the concept of the *value chain* by Porter (1980), symbolizes the unilateral role of the firm as a creator of value. Herein the firm is the producer of value whereas the customer is a consumer of value and does not take part in the value creation process (Prahalad & Ramaswamy, 2004).

The new logic, S-D logic, was introduced by Vargo & Lusch (2004) and is based on ten foundational premises (see Table 1). Opposed to G-D logic, S-D logic focuses on the action of operant resources upon other resources, and value arises from the “*beneficial application of operant resources, which are sometimes transmitted through operand resources or goods*” (Vargo, Maglio & Akaka, 2008, p. 148). This logic emphasizes the potential for co-creation of value through combined efforts and sharing of knowledge and resources between customers, suppliers, and other stakeholders, but the actual value is always determined by the beneficiary, which is the customer (Vargo, Maglio & Akaka, 2008; see FP 10 in Table 1). The roles of customers and producers are not distinct, but through the integration of resources value is co-created jointly and reciprocally (Vargo, Maglio & Akaka, 2008; Gummerus, 2013). Indeed, the role of the customer has changed from isolated to connected, from unaware to informed, and from passive to active (Prahalad and Ramaswamy 2004). Typical for this logic are continuous exchange processes and the development of dyadic relationships among customer and supplier (Ballantyne & Varey, 2006; Vargo & Lusch, 2008; 2004). S-D logic focuses more on the customer experience and is tied to the *value-in-use* concept (Vargo & Lusch, 2004; 2008; Vargo et al., 2008; Schembri, 2006), which is discussed in further detail in section 2.3.

A further distinction between G-D logic and S-D logic can be found in the conceptualization of service. First, G-D logic assumes value to be embedded in products and economic exchange is based on units of output. Thereby, service is viewed as a type of intangible good that supplements operand resources. However, in S-D logic *service* is defined as “*the application of competences (knowledge and skills) for the benefit of another party*” (Vargo & Lusch, 2008, p. 257), and the fundamental unit of (economic) exchange are specialized skills and knowledge (see FP1). Sometimes, goods are involved to convey competences (e.g. as a distribution mechanism for service provision; see FP3) but the essential source of value creation lies in services (i.e. competences, knowledge, skills) and not in the goods. Thus, in S-D logic, operant resources are viewed as primary as they are the producers of effects. In sum, G-D logic considers services as (somewhat inferior to goods) units of output, while S-D logic views service as a process of doing something for another party. As a result, the locus of value creation moves from the producing firm towards collaborative processes and co-creation between market actors. Thus, S-D logic represents a shift in logic of exchange and primacy of resources, not just a shift in type of product that is under investigation (Vargo & Lusch, 2008). Schembri (2006) delivered an elaboration on the first eight foundational premises by Vargo & Lusch (2004) and argues that the assumptions underlying the foundational premises are implicitly based on the rationalistic philosophy of G-D Logic. Some more recent studies (i.e. Schembri & Sandberg, 2002; Schembri, 2006; Sandström et al., 2008; Helkkula et al 2012; Ranjan & Read, 2016) highlight the importance of the customer’s value experience. Appendix A shows an overview of the differences among G-D logic and S-D logic.

	Foundational Premise
FP1	<i>The application of specialized skills and knowledge is the fundamental unit of exchange.</i>
FP2	<i>Indirect exchange masks the fundamental unit of exchange.</i>
FP3	<i>Goods are distribution mechanisms for service provision.</i>
FP4	<i>Knowledge is the fundamental source of competitive advantage.</i>
FP5	<i>All economies are service economies.</i>
FP6	<i>The customer is always a co-creator of value.</i>
FP7	<i>The enterprise can only make value propositions.</i>
FP8	<i>A service-centered view is customer oriented and relational.</i>
FP9	<i>Organizations exist to integrate and transform micro-specialized competences into complex services that are demanded in the marketplace.</i>
FP10	<i>Value is always uniquely and phenomenologically determined by the beneficiary.</i>

Table 1: The Ten Foundational Premises of S-D Logic (Vargo & Lusch, 2004; 2006; Vargo, Maglio & Akaka, 2008).

2.3 Value-in-Use

Value-in-use is strongly connected to S-D logic. Table 2 shows several definitions of value-in-use. In its most general form, value-in-use concerns the value that arises for the customer during the usage process of a product or service – which is a process the customer is in charge of, not the firm. Thus, value-in-use is driven by the customer's usage process and the resulting customer experience determines the value of that product and/or service (e.g. Vargo & Lusch, 2004; Ballantyne & Varey, 2006; Schembri, 2006; Sandström et al., 2008; Grönroos, 2011b; Gummerus and Philström, 2011; Helkkula, 2012; Gummerus, 2013; Grönroos & Gummerus, 2014; Ranjan & Read, 2016). Indeed, this implies that the firm can only make value propositions and create potential value-in-use (Vargo & Lusch, 2004; Ballantyne & Varey, 2006; Sandström et al., 2008; Grönroos & Voima, 2013; Skålén et al., 2015), as operand resources cannot have embedded value because they only contain value to the extent they serve customer's needs (Ballantyne & Varey, 2006). However, sometimes the value-in-use of operand resources is transmitted through operand resources (Vargo & Lusch, 2004; Sandström et al., 2008). Ballantyne & Varey (2006, p. 334-335) define value propositions as *“reciprocal promises of value, operating to and from suppliers and customers seeking an equitable exchange”*. Thus, in the value co-creation process, the supplier has a facilitating role for delivering potential value-in-use, and the customer is the operand resource that actually creates and determines value-in-use (Grönroos, 2011a; Normann and Ramírez 1993). Thus, as stated by Skålén et al. (2015) value propositions should be evaluated from the customer's perspective of value creation and experience of value through services.

Moreover, value-in-use is not a constant concept, but rather concerns continuous exchange processes between the customer and the firm, and value is accumulated over time (Grönroos, 2011b; Grönroos & Voima, 2013; Gummerus, 2013; Grönroos & Gummerus, 2014). Some authors attach value-in-use to functional outcomes (Payne and Holt, 2002; Sandström et al., 2008; Macdonald et al., 2011), whereas others emphasize customer goals (Flint, Woodruff, & Garial, 1997; Payne and Holt, 2002; Ranjan & Read, 2016; Macdonald et al., 2016) or benefits (Vargo & Lusch, 2004; Heinonen et al., 2010). Overall, the concept indicates that the customer's value perception is subjective and determined by experiences, learning, and the evaluation of processes and interactions with the supplier organization (Ballantyne & Varey, 2006; Schembri, 2006; Grönroos & Voima, 2013; Helkkula et al., 2012; Gummerus, 2013). Thus, with value-in-use, value is created through continuous processes that integrate resources rather than by units of firm output (Vargo et al., 2008). Following Ranjan

& Read (2016), value-in-use is comprised of three elements: experience, personalization, and relationship. First, *experience* is derived from the customer's linking of the products and services provided by the supplier across their physical, cognitive, and affective dimensions during the usage process. Second, *personalization* refers to the "uniqueness of the actual or perceived use process, the value being contingent on individual characteristics" (Ranjan & Read, 2016, p. 294). Personalization thus offers the possibilities of reconfigurations or cultural reshaping of the process. Finally, *relationship* includes the joint, reciprocal and iterative processes between the customer and the supplier. A positive relationship and collaborations tend to result in customer empowerment, which in turn yield higher levels of value-in-use (Ranjan & Read, 2016). According to Vargo & Lusch (2004), service companies that seek to be successful need to understand customer value as value-in-use and focus on the seller-buyer relationship in order to receive the highest value-in-exchange. Section 2.5 explains how value-in-use can be assessed.

Synthesizing the existing definitions in literature, this research proposes the following all-encompassing definition of value-in-use:

A customer perceives and determines value of products and services on the basis of value-in-use. Value-in-use is accumulated or destroyed over time based on subjective experiences throughout the customer's usage process in achieving a certain predefined goal or functional outcome. Since it is the customer who is in charge of the value creation process during the customer usage process, the supplier can only make value propositions and create potential value-in-use. However, the continuous exchange processes between customer and supplier allow the supplier to indirectly contribute to the customer's value creation process.

Author(s):	Definition of Value-in-use:
Flint, Woodruff, & Garial (1997, p. 170)	"Value in use reflects the use of the product or service in a situation to achieve a certain goal or set of goals."
Payne and Holt (2002, p. 162)	"Value-in-use, as the name suggests is a functional outcome, a goal purpose or objective that is served directly through product consumption."
Vargo & Lusch (2004, p. 7)	"Value is perceived and determined by the consumer on the basis of 'value in use'. Value results from the beneficial application of operant resources sometimes transmitted through operand resources. Firms can only make value propositions."
Ballantyne & Varey (2006, p. 344)	"We see value-in-use as the enactment of the value propositions that buyers and sellers express. The firm can only make value propositions (offerings), since it is the customer who determines value and co-produces it. This means that exchange value for the customer includes the estimated value-in-use of any goods exchanged."

Sandström et al. (2008, p. 120)	<i>“Value-in-use is the evaluation of the service experience, i.e. the individual judgement of the sum of all the functional and emotional experience outcomes. Value cannot be predefined by the service provider, but is defined by the user of a service during the user consumption.”</i>
Heinonen et al. (2010, p. 543)	<i>“We argue that value-in-use should be seen as everything that the company does that the customer can use in order to improve his life or business.”</i>
Grönroos (2011b, p. 287)	<i>“Value-in-use means that value for the user is created or emerges during usage, which is a process of which the customer as user is in charge. In the same way as service quality is perceived throughout the service process value is accumulating, or destroyed, throughout this process. It is not determined at the end of the process only.”</i>
Gummerus and Philström (2011, p. 526)	<i>“In-use value (consisting of emotional, esteem, monetary, convenience, and performance value) stems from a person’s experience of using a specific service.”</i>
Macdonald et al. (2011, p. 671)	<i>“Value-in-use is the customer’s outcome, purpose or objective that is achieved through service.”</i>
Grönroos & Voima (2013, p. 136)	<i>“The nature of value-in-use [...] is the extent to which a customer feels better off (positive value) or worse off (negative value) through experiences somehow related to consumption. Value thus accumulates over time through experiences during usage.”</i>
Grönroos & Gummerus (2014, p. 209)	<i>“Value-in-use is the value for customers, created by them during their usage of resources.”</i>
Ranjan & Read (2016, p. 296)	<i>“ViU is the customer’s experiential evaluation of the product or service proposition beyond its functional attributes and in accordance with his/her individual motivation, specialized competences, actions, processes, and performances.”</i>
Macdonald et al. (2016, p. 101)	<i>“All customer perceived consequences arising from a solution that facilitate or hinder achieving the customer’s goals.”</i>

Table 2: Definitions of value-in-use

2.4 Customer Solutions & Value Creation in Business Ecosystems

The increasingly dispersed nature of specialised knowledge and the networked nature of technology development causes organizations to be increasingly interdependent in their business and innovation activities (Adner and Kapoor, 2010; Kapoor & Agarwal, 2017). As a consequence to the rising trends of specialization, outsourcing and the knowledge intensiveness prevalent in many industries, suppliers frequently seek to differentiate by developing solutions to complex customer processes (Jaakkola & Hakanen, 2013). Cusumano et al. (2015) define *solutions* as combinations of products and services that are tailored to the needs of a particular customer. Furthermore, Friend & Malshe (2016) highlight the time

horizon aspect by considering solutions as ongoing, relational processes of defining, meeting and supporting a customer's evolving needs, while Macdonald et al. (2016) emphasize the collaborative aspect by defining solutions as combinations of supplier-customer processes and resources through a joint resource integration process. *Integrated solutions*, in turn, are defined as “*bundles of products and/or services that meet customer specific needs and are assumed to offer greater potential for value creation than the individual components would have alone*” (Jaakkola & Hakanen, 2013, p. 47). Worm et al. (2017, p. 2) summarize that “*solutions represent innovative custom combinations of goods and services geared to outcomes relevant to B2B customers*”, and distinguish four specific traits of solutions. First, solutions are created based on a supplier's understanding of customer requirements. Second, solutions are customized to the customer's activities and/or processes. Third, solutions are delivered through an output-based performance contract based on customer-specified metrics. Fourth, suppliers provide post-deployment support. Moreover, Worm et al. (2017) state that customer solutions are different from other goods-service combinations as solutions are designed around customer activities and/or processes rather than around supplier processes. In addition, solutions cause a fundamental shift in the supplier's value proposition because the supplier is not only committed to deploying resources and performing activities, but rather takes on responsibility to achieve specific outcomes that are defined by the customer (Worm et al., 2017).

The increased interdependence of organizations indicates that “*value is no longer created in isolation*” (Ritala et al., 2013, p. 3) and that value is more and more often co-created within a network of organizations that collaborate and compete in different or even the same markets (Ritala et al., 2013). This implies that the locus of value creation has shifted from focal firms towards business ecosystems (Kapoor & Agarwal, 2017). The concept of business ecosystems has emerged to shed light on the increased interdependence of organizations in their business and innovation activities (Ritala et al., 2013; Kapoor & Agarwal, 2017). According to Gomes et al. (2016), value creation is related to innovation ecosystems, while value capture is related to business ecosystems. The concept of *business ecosystem* was originally coined by Moore (1993, p. 4) who defined it as follows: “*In a business ecosystem, companies coevolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations*”. The interdependent and interconnected actors are the customers, agents and channels, sellers of complementary products and services, suppliers, and the organization itself. More recently, Kapoor & Agarwal (2017, p. 1)

state that business ecosystems are “*characterized by a firm that orchestrates the functioning of the ecosystem by providing a platform and setting the rules for other firms to leverage the platform and offer complementary products to the users*”. Furthermore, Kapoor & Agarwal (2017, p. 3) argue that *ecosystem complexity* – the degree of “*interdependence in the ecosystem based on the number of unique components that interact with a complementor’s product*” – influences the sustainability of the supplier’s (i.e. complementor’s) superior performance in value creation. Namely, high ecosystem complexity implies high technological interdependence among the supplier’s products (e.g. platform architecture and applications) and components of the customer and/or other suppliers in the ecosystem. As a result, the supplier is required to constantly optimize its products based on changes within the ecosystem in order to maintain the functioning and performance of the ecosystem (Kapoor & Agarwal, 2017). The concept of business ecosystems has been adopted in research in fast moving industries such as ICT and electronics (Ritala et al., 2013). Similar or overlapping constructs of business ecosystems are organizational networks, or clusters, and value networks (i.e. Lusch, Vargo & Tanniru, 2010; Ehrenhard, Kijl & Nieuwenhuis, 2014; Allee, 2008).

2.5 Assessing Value-in-Use in a Solutions Context

In prior literature, value is often viewed as a function purely of quality and price. Thereby, quality is determined by the anticipated or realized benefits of a product or service, while price is generalized to costs or sacrifices made by the customer (Zeithaml, 1988). However, as indicated in the previous sections, the concept of value-in-use is more complex. S-D logic emphasizes that the customer determines value and is a co-creator of value (FP10 and FP6), while firms can only make value propositions (FP7) and thus are creators of potential value. In its facilitating role, the firm exists to integrate and transform competences into complex services that are demanded in the marketplace (FP9; Vargo & Lusch, 2004; 2006; Vargo, Maglio & Akaka, 2008; Grönroos & Voima, 2013).

The different roles of service provider and customer in the value co-creation process and the accompanying complexity are illustrated by Grönroos & Voima (2013). In their research, Grönroos & Voima (2013) define three value creation spheres (Figure 2). First, in the *provider sphere*, the provider has the facilitating role of creating potential value, which the customer can later convert into actual value-in-use. Here, the firm is in charge of the relevant

processes such as design, development, manufacturing, delivery, front-office and back-office processes, in order to produce resources and processes to be offered for the customer's use. Next, in the *joint sphere*, the customer is in charge of value creation. However, through a dialogical process of direct interactions, the provider may influence the customer's value creation process and serve as a co-creator. Since the value spheres are dynamic, the boundaries of in particular the joint sphere can be moved. For instance, the provider may invite the customer to participate in the development- or design-process of new product development, or active customers may also cross the boundary into the provider sphere give input regarding improvements of products and services. If no direct interactions occur and the customer independently creates the value-in-use, the provider only is a facilitator of potential value. Third, in the *customer sphere*, the customer creates value as value-in-use independently of the provider. The customer's value creation process might also be influenced by other network actors or the customer's surrounding ecosystem, beyond the reach of control of the provider. The value creation process throughout the spheres is not necessarily a linear process. Value may be created in the different spheres at different periods of time or in different sequences (Grönroos & Voima, 2013). Since this research focuses on the value-in-use of software solutions perceived by the customer organization, the end user – that is the citizen – is not included in Figure 2 below or further analyses. However, it would be possible to include the citizen on the right side of the model.

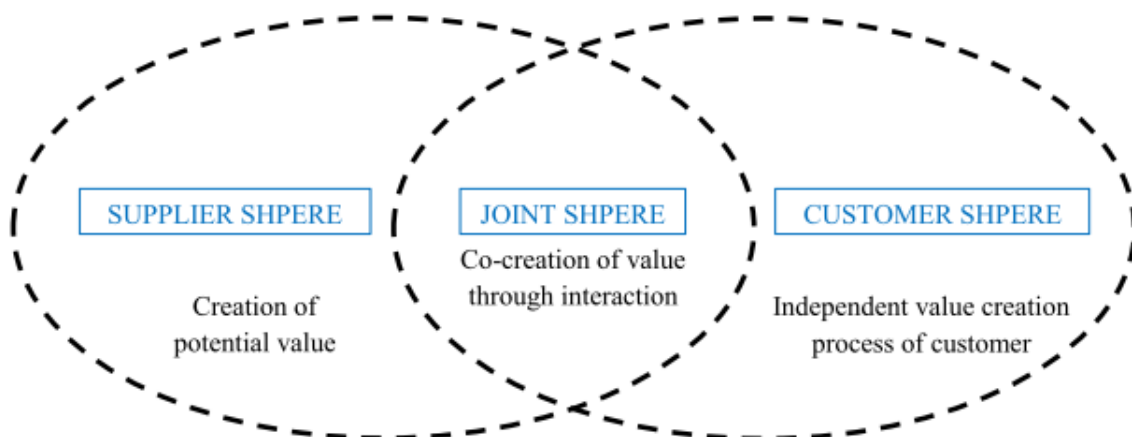


Figure 2: The Value Creation Spheres (adjusted from Grönroos & Voima, 2013).

The three value creation spheres clarify that the customer not just assesses or determines value, but actually creates value through a longitudinal and experiential process of usage. Thus, the customer is in charge of the experiential value creation process and may

invite the service provider to join this process as a co-creator of value, while the provider is in control of the production process and can invite the customer to join it as a co-creator (Grönroos & Voima, 2013; Schembri, 2006; Gummerus, 2013). It becomes clear that there is no direct relationship between the proposed quality by the supplier and the customer perceived value (e.g. Macdonald et al, 2016).

Instead, the proposed quality-perceived value relationship is influenced by several factors. Throughout the literature review, the following factors have been identified and will be discussed in the following subsections: (1) product and service quality, (2) the integration process which involves both supplier and customer resources, (3) customer usage process, (4) customer-supplier relationship, (5) the business ecosystem and (6) the presence of substitute offerings. The supplier only influences product and service quality and the supplier's resources. The customer influences the customer usage process, customer resource quality, and the perceived value-in-use is based on individual and organizational goals. The integration process, customer-supplier relationship and business ecosystem functionality are shared processes among customer and supplier. It becomes clear that several aspects that determine the customer's perceived value-in-use are outside the suppliers range of control. Given the heterogeneity of customer's value perceptions (Macdonald et al., 2016) and experiences (Schembri, 2006; Sandström et al, 2008; Helkkula, 2012), also the complexity of formulating suitable value propositions becomes apparent (Skålén et al., 2015). Besides, the nature of value is context-dependent (Vargo, et al., 2008; Edvarson et al., 2011; Helkkula, 2012; Vargo & Lusch, 2016).

2.5.1 Individual vs. Collective Value-in-Use

The relationship between quality and value (Zeithaml, 1988) can be conceptually underpinned by goal theory (see Woodruff 1997). Goal theory suggests that individuals have both their own individual goals as well as shared, collective goals. Moreover, individuals have goal hierarchies and individual and collective goals can be interconnected. As a result, value-in-use can be traced to both individual outcomes and collective outcomes on an organizational level (Ulaga and Eggert, 2006; Epp & Price, 2011; Meynhardt et al., 2016). To illustrate, managers can perceive multiple dimensions of both collective value-in-use constructs which relate to the goals of the organization, as well as individual value-in-use constructs that relate to the individual's personal role and interests. Besides the fulfilment of goals, customer perceived value-in-use is also influenced by the customer's interpretation of the goal

fulfilment, and the individual customer experience during usage of the product or service or during co-creation processes (Schembri, 2006; Sandström et al., 2008; Helkkula, 2012; Gummerus, 2013).

The heterogeneity of how customers judge solutions can be traced to the different goals individuals and organizations strive for, along with their experiences of value. As highlighted by Helkkula et al. (2012, p. 67) “*Value in the experience is individually intrasubjective and socially intersubjective*” and “*Value in the experience emerges from individually determined social contexts*”. This means that the context for the customer experienced value is not determined by the service supplier, but rather by the customer’s individual environment, which forms the basic reference for a customer’s sensemaking of value. Furthermore, individuals tend to make sense of value in the experience based on subjective preferences or what is considered socially beneficial (Helkkula et al., 2012). Therefore, it is important for suppliers to recognize the dynamic interplay and interconnectivity of the customer’s individual and collective goals in a social context order to prevent mismatches to occur between the designed solution and customer’s expectations (Macdonald et al., 2016; Helkkula et al., 2012). Besides that, value-in-use also may be experienced and perceived differently by different people within the same customer organization (Vargo & Lusch, 2016; Gummerus, 2013; Sandström et al., 2008). Although value in business markets has often been viewed as a function of organizational goals (Ulaga & Eggert, 2006), value-in-use requires also an assessment of the customer experience, and the interconnectivity of individual and collective goals.

Proposition 1a: The value-in-use of software solutions is determined based on interconnected individual and organizational goals which change over time and tend to be organized in goal hierarchies.

Proposition 1b: The value-in-use of software solutions is determined by subjective customer experiences.

2.5.2 Service and Product Quality

Traditionally quality has been understood in terms of anticipated or realized benefits of a product or service (Zeithaml, 1988). Thereby, product and service quality have been identified as antecedent to value (Woodruff 1997; Zeithaml 1988). However, solutions are more than just the sum of product and service components as solutions solve business

problems through the integration of products and services while drawing on the resources of both, customer and supplier organization (Tuli et al., 2007; Ulaga & Reinartz, 2011). Macdonald et al. (2016, p. 5) define *quality* in the context of business solutions as “*the perceived excellence or superiority of an entity*”. Furthermore, Grönroos & Gummerus (2014, p. 208) define *service* as “*the use of resources in a way that supports customers’ everyday practices - physical, mental, virtual, possessive - and thereby facilitate their value creation*”. In S-D logic, the term ‘service’ is utilized to reflect the process of using one’s resources (knowledge and skills) for the benefit of another entity (Vargo & Lusch 2004; 2008). Moreover, as mentioned in FP3, “*Goods are distribution mechanisms for service provision*” (Vargo et al., 2008). Moreover, Grönroos & Gummerus (2014), argue that through the direct interaction of service, the supplier can influence the customer’s value fulfilment, and build and maintain the customer relationship. Similarly, also earlier research claimed that service providing firms have the ability to influence the customer’s value creation process (Prahalad & Ramaswamy 2004; Schembri & Sandber, 2002; Ramírez 1999). Following Grönroos & Voima (2013), it is the interrelationship of product and service that affect a customer’s perception of value-in-use.

Proposition 2a: Product quality and customer perceived value-in-use of the software solution are positively related.

Proposition 2b: Service quality and customer perceived value-in-use of the software solution are positively related.

2.5.3 Integration Process of Supplier Resources and Customer Resources

Jaakkola & Hakanen (2013) argue that value arises when actors integrate and apply resources through interaction with other actors, and state that value is subjectively perceived based on the benefits and sacrifices derived from the process or outcomes of that interaction. Similarly, Grönroos & Gummerus (2014) found that value-in-use is jointly created through the integration of knowledge, skills, new and existing resources of both supplier and customer. Thus, the effectiveness of a solution depends on supplier variables (resources) as well as customer variables (Tuli et al., 2007). As a result, when evaluating a solution, customers assess the quality not just of the supplier’s resources and processes, but equally of their own. Since in the solution integration process both parties play an important role by drawing upon resources from both, Macdonald et al. (2016, p. 118) state “*Suppliers, then, do not deliver solutions; rather, suppliers and customers co-create them. This joint contribution*

to solution quality is a significant departure from the weight of research into quality, which regards quality only as a function of the supplier's actions". This view implies that also the value proposition is not solely proposed by the supplier, but that it is jointly designed by customer and supplier (Gummerus, 2013; Skålén, 2015).

Proposition 3: The integration process of supplier and customer resources is positively related to the customer perceived value-in-use of the software solution.

2.5.4 Customer Usage Process

The concept of value-in-use implies that value is not solely obtained in the economic exchange of market offerings but rather through their use and within a given context (e.g. Flint et al., 1997; Vargo & Lusch, 2004; Sandström et al., 2008; Grönroos, 2011b; Rakesh et al., 2014). To illustrate this, consider IT as an example. IT has historically been viewed as a supplier of software tools, however customers do not obtain value from the acquisition or possession of software tools itself. Rather, value is obtained through the usage of the software tools for a particular purpose (Lusch, Vargo & Tanniru, 2010). Besides, this has been the basic rationale for the development of Software as a Service (SaaS) (Lusch, Vargo & Tanniru, 2010).

Thus, value-in-use emerges (or is destroyed) through a cumulative process during the customer's usage process (Grönroos & Gummerus, 2014), which takes place independently of the supplier. Because it is the customer who is in charge of the usage process, the customer is also required to learn how to use, repair and maintain a product or service proposition. The value of a proposition is assessed and determined by the customer based on the experiential evaluation (Ranjan & Read, 2016; Sandström et al., 2008; Helkkula, 2012; Skålén, 2015) of the usage process as well as the degree to which customer goal hierarchies (Ulaga and Eggert, 2006; Epp & Price, 2011; Meynhardt et al., 2016; Macdonald et al., 2016) are met. The nature of value-in-use can also be seen as the "*extent to which a customer feels better off (positive value) or worse off (negative value) through experiences*" related to the usage process (Grönroos & Voima, 2013, p. 138). Thus, value-in-use cannot be assessed before the usage process (Grönroos & Voima, 2013).

Proposition 4a: The quality of the value-in-use perceived is based on the customer's experience and interpretation of goal fulfilment during the usage process.

Proposition 4b: The quality of value-in-use perceived during the usage process is directly influenced by the quality of customer resources.

2.5.5 The Customer-Supplier Relationship

Tuli et al. (2007) highlight that customers emphasize the importance of the relational processes of solution design and delivery. *“Customers view a solution as a set of customer–supplier relational processes comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) post-deployment customer support, all of which are aimed at meeting customers’ business needs”* (Tuli et al., 2007, p. 1). Moreover, Helander & Ulkuniemi (2012) state that customer perceived value-in-use is influenced by the success of the relationship between customer and supplier. In addition, also the relationship life cycle phase has been found to be a moderator of the customer’s value creation assessment (Eggert et al., 2006). Research by Song et al. (2016) has shown that customer involvement appears to be of positive influence on the relationship between service supply and customer perceived value.

The customer-supplier relationship is also of importance to joint problem-solving processes, which comprise activities such as diagnosing needs, designing and producing solutions, (re-)organizing the process and resources, and implementing the solution. Such interactions tend to have a positive effect in enhancing solution performance. This implies that the supplier’s ability to engage in active dialogue and interaction with the customer increases its potential to support in the creation of value-in-use (Powers et al., 2016; Aarikka-Stenroos & Jaakkola, 2012). Through such interactions, the supplier has the opportunity to directly and actively influence and contribute to the customer’s value creation process (Grönroos & Gummerus, 2014; Gummerus, 2013).

Proposition 5a: The customer-supplier relationship as well as joint problem-solving processes are positively related to the customer perceived value-in-use of the software solution.

Proposition 5b: Through active dialogue and interaction with the customer, the supplier may indirectly influence the usage process.

2.5.6 The Business Ecosystem

The locus of value creation has shifted from focal firms towards business ecosystems. A business ecosystem is characterized by *“a firm that orchestrates the functioning of the ecosystem by providing a platform and setting the rules for other firms to leverage the platform and offer complementary products to the users”* (Kapoor & Agarwal, 2017, p. 1). As

a result, the sustainability of the customer's superior performance has important implications not only for these organizations themselves but also for the supplying organization whose performance is tied to value creation by their complementors (Kapoor & Agarwal, 2017). Similarly, a solution network comprises a set of actors that are connected to each other for the purpose of integrating their resources to co-create value. Therefore, the nature of collaboration and communication between actors providing the resources comprising the solution is critical to solution outcomes (Jaakkola & Hakanen, 2013). Epp & Price (2011) emphasize that network value propositions can differ from individual (network members) value propositions and call for a deeper understanding of the dynamics, structure, and character of network goals. Furthermore, Breidbach & Maglio found that a lack of role clarity (of the customer's own role as well as the understanding of the roles of other participants) can hinder network participants in their willingness to contribute or share information.

Proposition 6: The technical as well as communicative functionality of the business ecosystem is positively related to the customer perceived value-in-use of the software solution.

2.5.7 Competition and Substitute Products

Following Worm et al. (2017, p. 13), a solution's success depends on the supplier's ability to *"understand how it can (1) help enhance customers' business and (2) create or enhance perceived value better than the competition"*. Indeed, the perceived value-in-use is relative to competition – alternative solutions that are available to fulfil a customer's particular need. To be superior to competition, the supplier should be able to create more value than the customer could achieve by choosing an alternative solution offered by a competitor (Helander & Ulkuniemi, 2012; Macdonald et al, 2016; Tuli et al., 2007). To illustrate, customers may compare a software solution to previously used ones or with features of competitor's offerings. Similarly, Halkkula et al. (2012, p. 67) found that *"Value in experience is constructed based on previous, current, and imaginary future experiences and is temporal in nature"*.

Proposition 7: The presence of substitute products and services by alternative suppliers influences the customer perceived value-in-use of the software solution.

3. Methodology

This chapter demonstrates the research design of the thesis. It is explained which research strategies and methods are applied and why these methods have been chosen. Furthermore, the selection procedures with regard to the interviews conducted, along with the data collection and analysis methods are described.

3.1 Research Design

This research aims to gain a deeper insight into the phenomenon of value-in-use and the co-creation of value in the specific field of software solutions within the social domain of Dutch local governments. As previous empirical research within this domain is scant, a qualitative, explorative research approach appears to be suitable (Yin, 2009). Saunders, Lewis & Thornhill (2012, p. 161) define qualitative research as a *“synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or uses non-numerical data”*. Furthermore, the nature of the research design is exploratory and inductive as this research aims to seek new insights into value-in-use of software solutions, but also to ask questions and assess value creation in a new light (Saunders, Lewis & Thornhill, 2012). Thus, the focus of this study is on the industry of software solutions and the research setting concerns the social domain of Dutch municipalities.

The research started with an extensive literature review on the two concepts of value creation and value-in-use through the lens of S-D logic. In the beginning, the research focus was broad in order to gain a fundamental understanding of what value creation actually concerns and how it is impacting the way companies deliver value to its customers. During the research process, the research question and the focus of the research has been changed and adjusted several times, which is a characteristic of exploratory studies (Saunders, Lewis & Thornhill, 2012). As the research progressed, the focus became narrower. Moreover, it was chosen to apply a case study research design as case studies are considered a particularly useful approach to develop a holistic understanding of complex phenomena by unpacking perceptions of value-in-use in a distinct industry (Gummesson, 2000; Yin, 2009). Furthermore, case studies are the preferred strategy when *“how”* and *“why”* questions are being posed, the researcher has little control over events, and the focus lies on a contemporary phenomenon within a real life context (Yin, 2009). The case study is based on a total of 17

semi-structured interviews. Five interviews have been conducted with employees of the case study organization (i.e. the software supplier Topicus Overheid), and 12 interviews were held with customers of the case study organization (i.e. employees from Dutch municipalities).

3.2 Interviews

3.2.1 Interviewee Selection Method

In order to develop a more holistic understanding of the customer perceived value-in-use of software solutions in the social domain of municipalities, it was chosen to put an emphasis on customer interviews. Therefore, 12 interviews have been conducted with employees from ten different municipalities that are customers of the case study organization Topicus Overheid and use software solution TOP. Starting point of the interviewee selection method thus has been the customer list of Topicus Overheid. In order to derive a representative sample, customer municipalities of different sizes and geographic location have been selected from the customer list. Due to the fact that Topicus Overheid is located in Enschede, in eastern Netherlands, the majority of Topicus Overheid's customers are also municipalities located in eastern Netherlands and tend to be of a smaller size as most large Dutch cities are located in the west. As a result, the majority of the selected municipalities are located in eastern Netherlands.

Since value-in-use is assumed to be determined based on both personal and organizational goals (see section 2.3), it was chosen to interview employees with a job function as a functional IT analyst, application analyst, information manager, or information/IT consultant (i.e. technical staff). Employees with these job functions are responsible for the functioning of IT at the municipalities, initiate and manage changes in IT, and serve as contact person between their organization and the supplier. In case staff employees have questions, problems or suggestions for improvement of the software, they will address this to the analyst or consultant who is responsible. The analyst or consultant will answer the question, solve the technical problems, and respond to improvement suggestions themselves or contact the supplier to do so. Thus, employees in these job roles have an understanding of the technical aspects of the software but also about the organizational goals the software should serve as well as the demands that staff employees have. Correspondingly, these persons have a bird's eye view and understand the complexity of the different views on value-in-use of software solutions, which makes them appropriate interview candidates for

this research. The potential interviewees from the selected municipalities have first been contacted by the case study organization and asked whether they would be willing to participate in an interview. Then, the persons with positive responses were contacted by the researcher to receive more information about the research objective and to schedule an appointment for the interview. The participating customer interviewees and corresponding municipalities are listed in Table 3 and Table 4, respectively.

However, in order to be successful as a software supplier, it is necessary to have a thorough understanding of the customer perspective on value-in-use. Therefore, it was also chosen to select five employees (see Table 5) of the case study organization and investigate their view on customer perceived value-in-use. In order to obtain a representative image of the perspectives present in the case study organization, employees with different job functions were selected. The CEO, product manager, and service manager were selected as these persons influence organizational decision-making processes. The software engineer was selected in order to verify whether there may be differences between the technical staff and management, while the implementation consultant and service manager were selected because they have intensive customer contact and are assumed to understand customer needs.

Customer Nr.	Interviewee Job Function	Municipality
Customer 1	-public version-	1
Customer 2	-public version-	2
Customer 3	-public version-	3
Customer 4	-public version-	4
Customer 5	-public version-	5
Customer 6	-public version-	5
Customer 7	-public version-	7
Customer 8	-public version-	7
Customer 9	-public version-	8
Customer 10	-public version-	6
Customer 11	-public version-	10
Customer 12	-public version-	9

Table 3: Overview Customer Interviewees

Municipality	Municipal cooperation	Total size by number of inhabitants*	Region COROP	Region:	Size by surface area**	Population density***
Municipality 1	-	Very small	Achterhoek	Eastern Netherlands	Large	Very low
Municipality 2	Cooperation of two municipalities	Very small	Twente	Eastern Netherlands	Large	Very low
Municipality 3	Cooperation of two municipalities	Small	Zuidoost-Noord Brabant	Southern Netherlands	Small	Medium
Municipality 4	-	Very small	Veluwe	Eastern Netherlands	Medium	Very low
Municipality 5	-	Very small	Twente	Eastern Netherlands	Small	Low
Municipality 6	-	Very small	Noord-Overijssel	Eastern Netherlands	Medium	Very low
Municipality 7	-	Medium	Twente	Eastern Netherlands	Medium	Medium
Municipality 8	-	Large	Groot-Rijnmond	Western Netherlands	Large	High
Municipality 9	Cooperation of three municipalities	Small	Zuidoost-Noord Brabant	Southern Netherlands	Small	Low
Municipality 10	-	Medium	Noord-Overijssel	Eastern Netherlands	Small	Medium

Table 4: Local Districts Participants – Demographics

* **Size classifications by number of inhabitants:** Large > 250,000 (G4 cities); Medium 100,000 - 249,999; Small 50,000 - 100,000; Very Small < 50,000.

** **Size classifications by surface area:** Large > 200 km²; Medium 120 km² - 200; Small < 120 km²

*****Size classifications by population density:** High > 2,000 inhabitants per km²; Medium 800 – 2,000 inhabitants per km²; Low 200 - 600 inhabitants per km²; Very low < 200 inhabitants per km²

Sources: CBS (2017); Metatopos (2016)

Supplier	Job Function
Supplier 1	-public version-
Supplier 2	-public version-
Supplier 3	-public version-
Supplier 4	-public version-
Supplier 5	-public version-

Table 5: Overview Supplier Organization Interviewees

3.2.2 The Semi-Structured Interview Method

The aim of the interviews is to collect in-depth views and perceptions directly from the customers of software solutions in the social domain of Dutch municipalities as well as employees from the supplier organization. In order to achieve this, the semi-structured interview method is applied. A semi-structured interview is a “*wide-ranging category of interview in which the interviewer commences with a set of interview themes but is prepared to vary the order in which questions are asked and to ask new questions in the context of the research question*” (Saunders, Lewis & Thornhill, 2012, p. 681). As a result, the qualitative, “*semi-structured interviews are flexible, responding to the direction in which interviewees take the interview and perhaps adjusting the emphasis in the research as a result of significant issues that emerge in the course of the interviews*” (Brymann & Bell, 2007, p. 474). The semi-structured interview method is suitable to the exploratory research approach as it can provide important background or contextual material for the study (Saunders, Lewis & Thornhill, 2012). Every interview is based on a list with specific key questions and topics to be discussed, which has been made available for the interviewees before the interview takes place. The semi-structured interview method offers the possibility to make sure that certain topics are covered in the interviews but also that further questions can be asked and more detailed information and views can be obtained (Brymann & Bell, 2007).

Based on the literature review, six factors have been identified that are influential on customer perceived value-in-use. Each of the six factors has been discussed as a key topic during the interviews. The six factors are: (1) service and product quality, (2) integration process, (3) customer usage process, (4) customer-supplier relationship, (5) business ecosystem, and (6) competitors and substitutes. After a discussion of how each factor might or might not influence the value-in-use experienced of the software solution, the interviewees were asked to give an importance rating for each respective factor in relation to value-in-use. The rating was based on a five point Likert scale ranging from (1) not important, (2) of little importance, (3) moderately important, (4) important, and (5) very important. The rating of the factors was used as a discussion tool to find out whether one factor might be more or less influential to value-in-use than others. The interviewee ratings can be found in Appendix II.

3.2.3 Interview Coding Method

Analyzing interview data is a multistep sense-making endeavor for which researchers must engage in the process of coding data. Basically, coding aims at data simplification and reduction. However, coding also allows for data expansion when making new connections among identified concepts, transformation by means of converting data into meaningful units, or reconceptualization of existing theories. The application of codes to data assists the researcher in examining whether and how their data supports or contradicts research literature. In this research, the theory-driven coding approach provided by DeCuir-Gunby, Marshall & McCulloch (2011) has been applied. In the theory-driven approach, codes are developed a priori based on existing theory or concepts. Generally, the development of codes is the first step in analyzing interview data. Codes are defined as “*tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study*” (DeCuir-Gunby, Marshall & McCulloch, 2011, p. 137). Overall, code development is an iterative process, whereby theory-driven codes typically require repeated revisiting of theory, while data-driven and structural codes necessitate repeated examination of the raw data (DeCuir-Gunby, Marshall & McCulloch, 2011).

3.2.4 Interview Data Quality

An interview time frame of 45-60 minutes is adopted to ensure that all key questions can be answered while still sufficient time is available to go into details. A majority of the interviews has been conducted as face to face interviews. However, due to relatively large distances and the limited time available, some interviews have been held via Skype or telephone. In order to enhance interview data quality and limit interviewer bias, the interview questions were formulated as open and neutral as possible. The interviewer attempted not to show personal opinions nor to determine or influence the direction of the interviewee's answers. The interviewer intended to let the interviewees speak uninterruptedly as far as possible in order to receive detailed information and opinions from the point of view of each respective participant. Whenever appropriate, probing questions were asked to obtain more detailed answers as well as to ensure the interviewee statement was correctly understood by the interviewer. In case the interviewer would face uncertainties during the analysis and interpretation of the interview outcomes, the interviewees were approached via E-mail or telephone to verify and avoid any misinterpretation. The conclusions that have been drawn

from the interview results, only refer to the selected sample and are not subject to generalization.

3.2.5 Transcripts and Audio Records of the Interviews

All interviews have been audio-recorded and transcribed. The audio records as well as the transcripts are held by the researcher and can be requested if necessary. Afore the interviews took place, the interviewees have been requested for their permission for the audio records. The transcripts contain the most relevant questions and statements from the interviews. For exact wordings, please refer to the audio-records. For any information or citations used from the interviews, the interviewees have been requested by E-mail to give their permission.

3.3 Data Collection and Data Analysis

In addition to the literature review, the qualitative case study is based on a variety of data sources such as: interviews (see section 3.2), observations, documents, conversations, and publicly available economic and demographic data and statistics from data bases such as CBS. Overall, a distinction can be made between primary data and secondary data sources. Primary data is collected by the researcher herself through interviews (supplier and customer organization), observations and discussions, whereas secondary data is collected by a person different than the researcher like the statistics and data obtained via CBS (Saunders, Lewis & Thornhill, 2012). The use of multiple data sources is typical for case studies and enables triangulation. Triangulation is a term used in social science to refer to “*the observation of the research issue from (at least) two different points*” (Flick, von Kardorff & Steinke, 2004, p. 178). In qualitative research, triangulation is considered as a strategy to enhance the validation of the procedures applied and results obtained from empirical social research (Flick, von Kardorff & Steinke, 2004). In fact, triangulation is the process of comparative data analysis from multiple sources which results in findings that possibly reinforce each other, which then validates the researcher’s findings. In this research, primary and secondary data collection methods have been combined, and the interview results contain two perspectives – supplier and customer.

4. Results

This chapter displays the research findings of the case study and consists of three main parts. First, value-in-use of software solutions and its six influential factors are described from a customer perspective. Secondly, a comparison of the customer vs. the supplier perspective on value-in-use is given. Finally, a distinction will be made among municipality type and attitude towards the decentralization, and its implications on customer perceived value-in-use. Appendix IV shows an overview of the propositions formulated in the Theoretical Framework and how these propositions have been adjusted and extended based on the Results of the case study.

4.1 Value-in-Use of Software Solutions From a Customer Perspective

4.1.1 Goals and Expectations of Software Solutions in the Social Domain

Since customer-perceived value-in-use is largely determined by the degree to which customer goals are achieved and functional outcomes are met throughout the customer usage process, this section aims to clarify the goals and expectations Dutch municipalities have regarding software solutions within the social domain. The interview results show that municipalities prefer an integral software solution that supports and structures the new processes and fits with the “*1 family, 1 plan, 1 supervisor*” objective. The most often mentioned (see numbers in brackets) goals and expectations of such a software solution according to the interviewed municipalities are as follows:

- Support work process from start to end, including back office (12/12)
- Centralized document creation and storage of (client) information (10/12)
- User friendly, easy and intuitive system (9/12)
- Possibility to connect or link with other (existing) software systems (8/12)
- Financial accountability and declaration system (7/12)
- Provide management information for planning and budgeting purposes (7/12)
- Compliance with laws, standards and regulations (6/12)
- Secured E-messaging and exchange of information with chain partners (6/12)
- Safeguarding data privacy (4/12)
- Secured exchange of information and data (4/12)
- System should be flexible and adaptive to change (4/12)
- Different access authorization modes for all participants involved (3/12)

A substantial majority of the interviewees found that a distinction can be made between personal and organizational goals with regard to the software solution. Personal goals refer to needs, wishes and preferences of the organization’s employees. The interview results revealed

that personal goals differ based on the type and level of the job. First, *staff employees* are engaged in direct client contact and are the ones that take care that the citizen receives the help and support they need. The staff employees are the primary users of the software solution. Secondly, *information consultants, functional IT analysts, and application analysts* (technical staff) are responsible for the functioning of IT at the municipalities, initiate and manage changes in IT, and serve as contact persons between the supplier and their organization. Third, *management* is responsible to set up and monitor the work processes and handle planning and budgeting. Table 6 shows the goals across different job levels as mentioned in the interviews. The distinction among type of goal per job function is well explained by one of the interviewees:

“Yes, you can differentiate among personal and organizational goals. Staff employees have different goals than functional IT analysts depending on their respective tasks and responsibilities and how they view the organization. Staff employees want to be supported in their daily work by being able to design family support plans and register properly. The functional IT analyst wants a certain flexibility to control and design the system and to build connections with other software systems. The organization takes a broader view: The process should be supported from start to end, but the system should also handle payments and provide management information for planning and budgeting purposes” (C11; M10).

The hierarchy of goals appears to differ per person as well as per job function. In general, there are some primary goals that need to be satisfied from an organizational perspective concern work process support, compliance with laws, regulations and standards, well-organized data privacy and secured exchange of information. Goals subordinate to the primary goals tend to be related to user friendliness and lowering the burden of administration for *staff employees*. The *technical staff* favours goals related to freedom of system design and customization, easy problem solving, increasing process flows and establishing connections with other software systems. *Management* favours goals related to increasing efficiency, lowering costs, the creation of management information data out of the system, and financial accountability of actions performed. Indeed, most interviewees argued that organizational goals should carry priority over personal goals and that software choices should be mainly based on organizational goals (i.e. C2;M2, C4;M4). To illustrate, an application analyst stated: *“You may have personal preferences because of your job role, but in the end you make decisions that are in the organizations interest” (C5;M5).*

However, the choice of software should also take personal goals of staff employees into account. *“Focusing on organizational goals only has disadvantages. Of course, the*

system should first fulfill certain primary organizational goals with respect to legal and operational requirements, however, the importance of personal goals should not be overlooked or underestimated" (C1;M1). Similarly, another interviewee highlighted: *"It is the staff employees who work with the software on a daily basis. If the software supports them in performing their tasks and makes registration easy and time-efficient, the entire organization benefits because of time efficiency and resulting lower costs, better help and support for citizen, better quality of management information due to better registration by employee"* (C9; M8). Thus, personal and organizational goals are interconnected and reinforce each other. Therefore, both personal and organizational goals are important and should be considered in the choice of software as goals are interconnected. *"Personal goals benefit the organization, and reversely, organizational goals benefit the people"* (C5;M5).

Furthermore, goals and the hierarchy of those goals tend to change over time. Initially, the customer organization has primary goals (i.e. being able to register properly, comply with laws and standards). As soon as primary goals are covered, over time, customers demand more of the software (i.e. management information, smoothening processes, connecting with other software systems). This effect is reinforced by the fact that the social domain is very young and many things were unclear in the beginning, and laws and requirements slowly change towards the decentralized system. The software has to grow along with the changing demands of the social domain. Some interviewees highlighted that it is not necessarily the goals in itself that change over time, but the priority of those goals. *"Goals that are fulfilled get lower positions on the list and things that can be improved gain priority in the goal hierarchy"* (C6; M5).

The above mentioned results are in line with prior literature on value-in-use stating that value-in-use is subjective and can be traced to individual and collective outcomes which change over time, that goals are interconnected, and that goals can be organized in hierarchies (Ulaga and Eggert, 2006; Epp & Price, 2011; Meynhardt et al., 2016; Macdonald et al., 2016; Vargo & Lusch, 2016). Proposition 1 can thus be extended to:

Proposition 1a: The value-in-use of software solutions is determined based on interconnected individual and organizational goals which tend to be organized in goal hierarchies.

Proposition 1a1: Goal hierarchies tend to differ based on job function.

Proposition 1a2: The position of goals in goal hierarchies tend to change over time based on goal fulfilment or unfulfilment.

Proposition 1b: The value-in-use of software solutions is determined by subjective customer experiences.

Personal Goals			Organizational Goals
Staff Employees	Technical Staff	Management	
<ul style="list-style-type: none"> • Ease of use, intuitiveness, user friendly, and practical system • Spend the least amount of time possible on registration/administration, leaving as much time possible to serve the client • Task simplicity • Support work process • Easy registration • Overview of clients and professionals involved and help supplied; having an integrated view of the customer and history • Finding client information quick and easy • Working in a more efficient manner 	<ul style="list-style-type: none"> • Support and structure the work process • Freedom of system design and options • Degree of customization • Flexible system that is easy to adjust to change • Easy problem solving (with supplier) • Establish connections with other software systems • Increase process flow • Comply with laws, standards, and regulations • Safeguard privacy and security of client data • Authorization modes well organized • Innovativeness, adaptability and development of supplier • Satisfaction of staff user, leading to less complaints 	<ul style="list-style-type: none"> • System should fit with organizational vision and values • Support work process from start to end including back office tasks • Increase efficiency and reduce costs by using an integral system that supports the employee to do his/her work well • Easy and efficient administration system leads to better quality of registration • Comply with laws, standards, and regulations • Increase process flow • Increased automatization • Safeguarding privacy and security of client data • Authorization modes well organized • Innovativeness, adaptability and development of supplier • Cover financial and organizational responsibilities • Declaration system • Establish connections with other software systems • Provide management information for reporting purposes, budgeting, procurement, case load determination, and planning • Monitoring 	<ul style="list-style-type: none"> • System should fit with organizational vision and values • Increase efficiency and reduce costs by using an integral system • Support work process from start to end including back office tasks • Comply with laws, standards, and regulations • Safeguard privacy and security of client data • Authorization modes well organized • Innovativeness, adaptability and development of supplier • Collaborating with other municipalities • Provide management information for reporting purposes, budgeting, procurement, case load determination, and planning • User friendly • Monitoring • Degree of customization • Cooperating and collaborating with supplier for development purposes • Choosing a local software supplier to attract employment and IT companies to our region

Table 6: Personal and Organizational Goals of Software Solutions by Job Function.

4.1.2 Product and Service Quality

The quality of the software solution and the quality of the service delivered by the supplier are the basic building blocks of the supplier's value proposition. Both, product and service quality serve as a fundamental basis of the potential value-in-use the customer can obtain during the usage process. Aspects customers value the most about the quality of the software solution are functionality, continuity, stability, trustworthiness, a user friendly design, compliance with laws, regulation and standards, flexibility and adaptability of the system, customization possibilities, good quality of management information, continuous system development to keep up with movements in the industry, and good handling of privacy and security standards. In addition, customers want to receive value for their money. *"The price-quality ratio should fit. It is an expensive system that should match with your expectations. However, reaching your goals is much more important than price. A few thousand Euro's doesn't make such a difference as long as the product is good. Prices of all suppliers are comparable anyway"* (C10; M6).

Concerning service quality, customers highly value suppliers with a proactive attitude towards clients. In general, customers want to feel that the supplier understands and is committed to their business and organizational needs. In case of questions or problems, customers want to receive a quick and adequate response or solution. In particular, customers highlight the importance of the supplier honouring agreements made in a timely manner (i.e. not only making promises) and open communication. *"The most important thing is that you receive what you requested and paid for"* (C6;M5). Moreover, customers value customized solutions: *"Delivering the service to make custom-made options for the software besides the standard system you offer. That would be a reason favouring the choice for a certain software solution"* (C10;M6). In addition, it should be possible to quickly respond to changes and adapt the system. Due to the fact that the social domain is young and still subject to regulatory and operational developments, service quality is more important than in more mature industries. *"In this very young domain there is a lot that needs to be developed or improved. That is what you need service for, otherwise you stagnate"* (C8;M7). Therefore, customers consider continuous software improvements and collaborations with the customer to be important aspects attributable to service quality. If the domain becomes more mature and stabilized, the developmental aspects of service will likely become somewhat less important.

In general, most customers believe that product quality is most important. *"It all depends on the quality of the software solution. Service is important too, but service cannot*

substitute for inferior product quality” (C1; M1). Similarly, most interviewees stated that less service will be necessary if the software solution is of good quality. However, a minority of interviewees argued that service quality is most important and that suppliers can distinguish themselves from competitors by delivering superior service. Some interviewees stated that service and product quality are equally important because the two are interconnected and should reinforce each other. In sum, it comes down to the following interviewee statement:

“You receive software that is assumed to meet a certain basic quality. You use service to customize the software in order to fit your organizational needs. And, of course, you want to be heard and helped as a customer. Mistakes always occur but that is not a problem as long as there is open communication, you make agreements with each other, and solve the problems. If agreements are not honoured, or later than planned, then it leads to frustrations” (C12; M9).

It appears that the interview results correspond with existing literature, wherein product and service quality are identified as antecedent to value (Woodruff 1997; Zeithaml 1988). Moreover, it is the combination of product and service that affect a customer’s perception of value-in-use (Grönroos & Voima, 2013). Thus, proposition 2a and proposition 2b can both be confirmed and extended to:

Proposition 2a: Product quality and customer perceived value-in-use of the software solution are positively related.

Proposition 2b: Service quality customer perceived value-in-use of the software solution are positively related.

Proposition 2c: Most customers value product quality over service quality.

Proposition 2d: In immature industries that are subject to change and development, service quality is of higher importance.

4.1.3 The Implementation Process

During the implementation process, the customer resources and supplier resources become integrated. Following the theory, value arises when actors integrate and apply resources through interaction with other actors, while value is subjectively perceived based on the benefits and sacrifices derived from the process or outcomes of that interaction (Jaakkola & Hakanen, 2013). Moreover, the implementation process serves as a first impression of the supplier at the customer organization, and it determines the image and opinion about supplier and product. It also is the start of the relationship or partnership with the supplier and forms

the basis for understanding and trusting each other. As illustrated by one of the interviewees: *“Trust comes by foot and leaves by horse. This also plays a role. If things go wrong in the beginning, it will take a long time and a lot of effort to make up for that”* (C8;M7). A majority of the customer interviewees agreed that a smooth and well-organized implementation process leads to a better impression of the software and supplier and overall creates more user acceptance, while a sloppy implementation process would lead to more frustration and blaming of the supplier in case of problems after the implementation. *“People judge very easily. If something goes wrong with the software – even if it is not the supplier’s mistake – it serves as a confirmation of that initial judgement”* (C11; M10).

Similar to the findings by Macdonald et al. (2016), customers indeed assess not just the quality of the supplier’s resources and processes, but equally of their own. *“If the software is well-implemented from the beginning, it makes working with it easier. But that doesn’t mean that everything will be flawless. Also the users and the person in charge of the processes at the customer organization are of influence on the implementation process, which is something the supplier can’t control. No matter how well the supplier organizes the implementation process, the choice of the software solution should be supported by the users and processes need to be well supervised in order to function properly. [...] However, if the implementation process is badly organized by the supplier but users are very motivated, they will make it work anyway. User motivation is key”* (C2;M2). Furthermore, it is important that supplier and customer organization establish a common language and terminology as well as quality standards, in order to prevent misunderstandings and enhance clarity.

Furthermore, the implementation process is not only a technical issue, it is also about educating and supervising the people who are going to work with the software. *“Good guidance on both, the technical and the people part is needed”* (C8; M7). Usually, there is an implementation team made up of functional IT analysts, information consultants and the supplier, that is responsible for the technical part. As soon as the system is in place, users will be instructed to work with the software in form of a training (either performed by the supplier or customer organization). If the software is technically not well implemented or wrong decisions have been made, it can take a long time to adjust. For this reason, some interviewees highlighted that the implementation process is not that much of a concern for users and has a relatively low impact on the value-in-use of staff employees. The implementation process is mainly is a concern of the functional IT analysts and information

consultants and, thus, has a higher impact on the perceived value-in-use of the technical staff. Based on these results, proposition 3 can be adjusted and extended to:

Proposition 3a: The integration process of supplier and customer resources during the implementation of the software solution is of relatively low impact on the value-in-use perceived by staff employees because they are not directly involved in the implementation process.

Proposition 3b: The integration process of supplier and customer resources during the implementation of the software solution is of relatively high influence on the value-in-use perceived by technical staff employees because they are actively involved in the implementation process.

Proposition 3c: The implementation process serves as a first impression of the supplier at the customer organization and influences future judgement or opinion about the supplier.

Proposition 3d: Process design, user motivation and acceptance determine the success of the software solution at the customer organization after the implementation.

Proposition 3e: The implementation process requires guidance of the supplier on both technical aspects as well as education and supervision of users.

4.1.4 The Customer Usage Process

The theoretical concept of value-in-use implies that value is not solely obtained in the economic exchange of market offerings, but that value-in-use rather emerges (or is destroyed) through a cumulative process during the customer's usage process within a given context (e.g. Flint et al., 1997; Vargo & Lusch, 2004; Sandström et al, 2008; Grönroos, 2011b; Rakesh et al., 2014; Grönroos & Gummerus, 2014). As described earlier in section 2.5, the customer's value creation process is influenced by customer resources, the customer's surrounding ecosystem or other network actors. In most cases, the supplier has a facilitating role and cannot directly influence the customer's value creation process. However, it is possible for the supplier to indirectly contribute as a co-creator of value through collaborations in the development- or design-process of new product development.

The interview results obtained from the case study largely confirm theory. The integral software solution TOP assists municipalities in fulfilling their new tasks and responsibilities within the social domain by structuring the new work process and connecting the ecosystem in an efficient way. The highly efficient software solution lowers the staff's burden of administration, leaving them the maximum amount of time to spend on client care and

support. The software thus serves as a tool to reach the goals as formulated in section 4.1.1. But, it is also the usage process where practical problems are being encountered which were not anticipated upfront or in theory. This is especially true in this case, where the domain is young and the software new. For example, in case of blended families, the principle of 1 family, 1 plan, 1 supervisor becomes much more complicated. *“How do you register this in a centralized document? And how do you deal with data privacy issues? Who is allowed to see what items of the support plan?”* (C1; M1). An additional problem that arises in practise are the different registration habits and language of employees. *“When do you label a family situation to be severely problematic or dangerous? A local district team-member’s definition likely differs from the one of a police officer or general practitioner”* (C4; M4).

Moreover, the quality of the customer usage process, and thus the perceived value-in-use, is greatly influenced by the quality of customer resources. *Client resources* that influence that usage process are PC skills and learnability of employees, motivation and willingness to work with the new software and collectively spur growth and development. Also, the process design of the customer organization is of influence, as well as to what degree employees receive guidance and support from their organization to become acquainted with the new processes and software (i.e. by having key users). A majority of interviewees found employee PC skills and learnability, along with the differences in those skills and registration habits to most influential client resources of the usage process. *“What we noticed with our local district teams: You can teach people the same thing, but that does not mean that they will do things the same way. You need affinity and willingness to work with the new system and properly register in order to maximally benefit from the system. And, in general, the affinity with ICT is quite low within the social domain”* (C7; M7). Similarly, another interviewee stated: *“there is quite a difference in how quick and how well employees become acquainted with new software. Some master it within a few days, others don’t”* (C5; M5).

Although suppliers cannot directly influence the customer usage process, they may indirectly do so by maintaining close customer contact or through joint collaborations and development. By clearly communicating the opportunities the software provides and offering (repeated) software trainings on the job, the supplier can contribute to better software usage. The interview results revealed that many customers feel the need to actively engage with the software supplier, realize growth and development through collaborations, and overall would like to receive more guidance and support from the supplier to set up the new processes and become acquainted with the software. This feel may be reinforced by the fact that the social

domain is young with a low degree of standardization, and many municipalities still have to perform interorganizational changes to optimize the new processes. A supplier who shows commitment to its customers may also create a feel of comfort. Furthermore, customers expect the software supplier to be well-informed about the developments and changes within the domain. *“It should not be the case that we have to explain the supplier what is going on and what changes will be needed in the software. We expect them to be informed and to facilitate us in making those changes”* (C4; M4).

In addition, the supplier could also influence the usage process by software design. The more user friendly and intuitive the software, the more likely customer will be able to work well with the software. A very clear-cut program that guides the employee through the work and registration process will lead to a better registration quality and better management information. Appointing key users may also help. The key users receive extensive software training and become experts of the software solution. The key users serve as a connector between Social and ICT. *“The software supplier can take influence in the customer usage process by using user feedback and do regularly evaluations. By centralizing the professional, the supplier can optimize the software from a user perspective. That would positively influence the usage process. It all starts with the daily use of the employees”* (C12; M9). Another way to actively engage with customers is through co-development and software testing. *“Topicus tested the software at our organization. That creates commitment from both sides. Topicus was able to obtain a good image of our organizational needs in practice and anticipates on that. Through operational and strategic collaborations you will yield the optimal results”* (C11; M10). Proposition 4, thus, can be confirmed and extended to:

Proposition 4a: The quality of the value-in-use perceived is based on the customer’s experience and interpretation of goal fulfilment during the usage process.

Proposition 4b: The quality of the value-in-use perceived during the customer usage process is directly influenced by the quality of customer resources and process design.

Proposition 4c: The heterogeneity in PC skills and registration habits of users are considered to be the most influential client resources on the perceived value-in-use during the usage process.

Proposition 4d: The supplier may indirectly influence the value-in-use perceived by the customer during the usage process through intuitive software design, close customer contact, collaborations or co-creation.

Proposition 4e: In immature ecosystems that are subject to change, customers appear to be more willing to collaborate with the supplier, which increases the supplier's ability to indirectly influence the customer usage process.

4.1.5 The Customer-Supplier Relationship

According to Helander & Ulkuniemi (2012), the customer perceived value-in-use is influenced by the success of the relationship between customer and supplier. Especially in a solutions context customers emphasize the importance of relational processes in solution design and delivery (Tuli et al., 2007), as well as joint problem-solving processes (Powers et al., 2016; Aarikka-Stenroos & Jaakkola, 2012). It is through such interactions, that the supplier has the opportunity to directly and actively influence and contribute to the customer's value creation process (Grönroos & Gummerus, 2014).

Overall, customers prefer to have a good customer-supplier relationship. A good connection with the supplier makes it easier to ask questions and openly communicate, give feedback or input, and jointly solve problems. *"A good relationship helps building a partnership, which is long term oriented"* (C7; M7). A majority of customers stated that it comforts them to always have the same person(s) of contact at the supplier organization. A good customer-supplier relationship also *"increases mutual understanding and raises enthusiasm. Which motivates users to make best use of the software"* (C11; M10). A good relationship can thus be interpreted as a supportive factor to improve the usage process and increase perceived value-in-use.

Furthermore, customers view the relationship as a tool to steer system improvements and development. A majority of customers emphasized that the relationship, collaborations, and customer feedback are of high importance because the very young social domain is still subject to development and change. Therefore, the supplier should show an open attitude for improvement and apply user feedback to make the system more appealing from a practical perspective. Customers expect a proactive attitude of the supplier towards the customer and state that the *"supplier should not wait until the customer approaches them with questions or suggestions"* (C10; M6). Also, the extent to which the customer is given a voice appears to be important for the customer-supplier relationship: *"Topicus has found a good strategy to realize that. Four times a year, they organize a meeting for the information managers of their customer organizations. By doing so, they offer a platform for municipalities to find each*

other and together discuss what is important and should be the next points of attention on their agenda” (C9; M8). Thus, a good relationship is supportive of the value co-creation process and contributes to further development of the software. In addition, customers distinguish the relationship from service. While service is seen as a general form of customer support, *“in a relationship both parties are viewed more equally and provide input based on their expertise” (C11; M10).*

However, the customer-supplier relationship is not a decisive factor for the customer’s satisfaction with the product. *“I would rather have a bad customer-supplier relationship and a good product than the reverse” (C4; M4).* Some interviewees therefore argued that the customer-supplier relationship is not that important for value-in-use. As long as the software is of good quality and the customer receives a sufficient level of service when needed, then the relationship with the supplier does not necessarily have that much effect on the perceived value-in-use. *“But, if possible, you would rather have a person you feel comfortable communicating with” (C12; M9).*

The argument that the customer-supplier relationship is not a decisive factor for the customer’s satisfaction with the product can be further supported by the fact that the customer-supplier relationship typically concerns the direct link between the functional IT analysts with the supplier, and usually does not involve a direct connection with the user. Thus, the customer-supplier relationship is of stronger influence on the value-in-use perceived by the functional IT analysts, compared to the value-in-use perceived by staff employees. However, indirectly the relationship between supplier and the functional IT analyst can influence the value-in-use perceived by staff employees as they can benefit from improvements made to the software. Reversely, if users have suggestions for improvement or questions and address these to the functional IT analyst, and the functional IT analyst has a bad relationship with the supplier, this may have a negative effect on the value-in-use perceived by staff employees because they may be demotivated by no or late responses. Some functional IT analysts highlighted that it can be difficult to distinguish among the professional and personal relationship in case of problems. If there is a good personal relationship, it may be more difficult to confront the supplier with unsatisfying results, problems or mistakes. So, proposition 5 can be adjusted and extended to:

Proposition 5a: The customer-supplier relationship is of relatively high influence on the perceived value-in-use of technical staff, because it mainly concerns the link between the functional IT analyst and the supplier.

Proposition 5b: The customer-supplier relationship has a low impact on the value-in-use perceived by staff employees because they have no direct relationship with the supplier.

Proposition 5c: A good customer-supplier relationship and joint problem solving processes can be a supportive factor to improve the usage process and increase perceived value-in-use.

4.1.6 The Business Ecosystem

The integrated software solution TOP by Topicus aims at chain integration (see section 1.7). Customers view the integrated software solution as a tool to better cooperate in the business ecosystem, which leads to better care and support for citizen. An integral system makes it easier to communicate and it enables everyone in the business ecosystem to contribute to the support plan. *“By centralizing all information in one system with a single login for the social domain and providing the citizen with access to this system and the data, transparency towards citizen can be enhanced and the citizen is given a more active role”* (C7; M7) in the ecosystem. Furthermore, customers believe that the integral system will yield quality improvement: *“Working with a number of people and entities in an integral system keeps you focused because you take into account that other people see what you register, and there is double control. I think this will stimulate employees to better register and communicate, which is a good thing for everyone involved”* (C4; M4).

A majority of the customer interviewees stated that they cannot think of any disadvantages of having an integral software solution for the business ecosystem, only some ‘hurdles’ which need to be overcome. The most often mentioned hurdle refers to dealing with privacy issues. Especially because each network actor (i.e. healthcare provider, police officer, municipality and local district teams) acts based on different rules, regulations and standards. Besides that, each network actor has different concerns and interests. As a result, there always is a risk involved that information is (mis)used for other purposes than intended. Thus, the integral software solution requires integrity, mutual trust among network actors and different layers of authorization and data access in order to deal with data privacy. *“It takes a lot of organizational effort to realize that. You do not just push a button and it works. For example, we need a common language of registration. A lot of arrangements among all parties involved will have to be made”* (C6; M5). Thus, while an integrated software solution increases efficiency, transparency and enables municipalities to deliver better care and support, it does also increase complexity. *“Because of chain integration, you ask more of the*

system – especially concerning privacy and information sharing. That makes it much more complex. If you would have a system that is limited to your organization and can only be accessed by members of your organization, that would be a lot simpler to organize” (C11; M10). A second hurdle concerns the local district team members. It appears that some local district team members are anxious about the fact that other professionals as well as the citizen can watch what they register in the system. “That raises the risk that employees will become hesitant to register which results in incomplete data” (C4; M4). “They also have to get used to this new way of working. Increased transparency of data also means that the professional will need to more openly communicate with the citizen” (C3; M3).

Finally, some interviewees raised the question whether citizen actually have an interest to access the system and be an active participant in the ecosystem. But, “As an organization, we at least want to offer the possibility for citizens to access the system” (C10; M6). Overall, it appears that the functionality of the business ecosystem mainly contributes to value-in-use on an organizational level, while on the personal level of staff employees network functionality delivers a relatively lower contribution to value-in-use. Proposition 6 can be adjusted and extended to:

Proposition 6a: An integrated software solution is considered a tool to better cooperate and yield quality improvement in the business ecosystem .

Proposition 6b: Privacy issues are considered the biggest hurdle as a result of the complexity associated with an integrated software solution in a business ecosystem.

Proposition 6c: Both technical and communicative functionality of the business ecosystem positively contributes to the value-in-use on an organizational level.

4.1.7 Competition and Substitutes

A handful of Dutch software suppliers has developed a software solution in response to the decentralization of the social domain. The suppliers developed systems with rather different value propositions, design and options. What all systems have in common is that all are new and still subject to development. Most interviewees answered that none of the suppliers offers a software solution that covers their goals and expectations to 100%. In addition, municipalities have dealt very differently with the decentralization. “You choose the software solution that most closely matches with your organizational vision. From there on you customize the system and refine processes in collaboration with the supplier” (C3;M3).

Moreover, the interviewees stated that the existence of competitors is important to maintain high quality offerings.

In prior literature, it is argued that the perceived value-in-use is relative to competition and is subject to comparison with substitutes (see Worm et al., 2017; Helander & Ulkuniemi, 2012; Macdonald et al, 2016; Tuli et al., 2007). According to the case study results, customers in the social domain indeed compare new software with the software they used previously or alternative software that is being used by other municipalities. Especially when the system is newly implemented, staff employees of customer organizations tend to compare the new software with the one(s) they previously used based on features and design, and form an opinion about the new software based on that comparison. Alternatively, *“if another municipality has a different software solution and benefits from it or faces struggles, it gives you a worse or better feeling about the software you chose”* (C4; M4). Comparisons, thus, can positively or negatively influence how customers experience the software and how satisfied they are about their choice, leading to either a higher or lower perceived value-in-use. This finding is in line with the statement by (Grönroos & Voima, 2013, p. 138) that the nature of value-in-use can also be seen as the *“extent to which a customer feels better off (positive value) or worse off (negative value) through experiences”* related to the usage process. One of the interviewees explained that the degree to which municipalities compare their software with peers and openly communicate their experiences with each other might be different from other industries. *“As a municipality, we have a monopoly position, and there are about 388 of us in the Netherlands. We have very similar organizations but there is no actual competition. This is why we easily communicate with each other and gain insight in how other municipalities experience other software solutions and how they cope with the decentralization. You always keep comparing your system and your choices with those of your peers”* (C8; M7).

Furthermore, the role of competition appears to be dependent on phases. If the municipality has no system in place and is looking for one, competition will play a relatively large role. Based on a list of criteria (see section 4.1.1) and organizational values, municipalities will compare the available offerings and select the most suitable option. Similarly, in case when the contract with the current software supplier is close to termination, the role of competition will increase as customers will make comparisons. The same holds for municipalities that did not opt for an integrated system from the beginning, but decided to use a combination of existing systems and new software. If such a municipality decides to

reorganize and wants to convert towards a single software solution, they will likely compare their current software suppliers and chose the best fit and abandon the other.

However, as soon as the organization has chosen a particular software system, the role of competition declines. The implementation process takes a long amount of time (up to a couple of months), “*it is cumbersome to switch and transfer all documents to a new system*” (C3; M3), and above all, it is “*very expensive to switch and buy a new software system*” (C12; M9). These three factors serve as a barrier or customer lock-in once the software has been chosen and implemented.

In sum, the existence of substitute products can have a positive influence on customer perceived value-in-use if customers feel that the chosen software system has advantages compared to previous systems or software used by peer organizations. But the existence of substitute products can also have a negative influence on customer perceived value-in-use if customers feel that the chosen software system has disadvantages compared to previous systems or software used by peer organizations. The existence of substitute products can also have a negative impact on customer perceived value-in-use if expectations about the are not being met in practice and the customer is dissatisfied and feels that a competitor offering may would have been a better choice. Proposition 7 can be adjusted and extended to:

Proposition 7a: Due to the presence of substitute products and service, customers make comparisons which leads to a better or worse feeling about their own choice of software, which in turn yields a respectively higher or lower perceived value-in-use of the software solution.

Proposition 7b: The role of competition and substitutes is phase dependent.

Proposition 7b1: The role of competition and substitutes increases if the customer is about to acquire a software solution or if the contract with the current software supplier is close to termination.

Proposition 7b2: The role of competition and substitutes declines when the customer organization has chosen a particular software system.

4.1.8 Conceptual Model of the Factors Influential on Customer Perceived Value-in-Use

The final propositions formulated in the sections 4.1.1 throughout 4.1.8 are summarized in the conceptual model below (see Figure 3). The three value creation spheres (Grönroos & Voima, 2013) demonstrate the different roles of customer and supplier in the value-creation process.

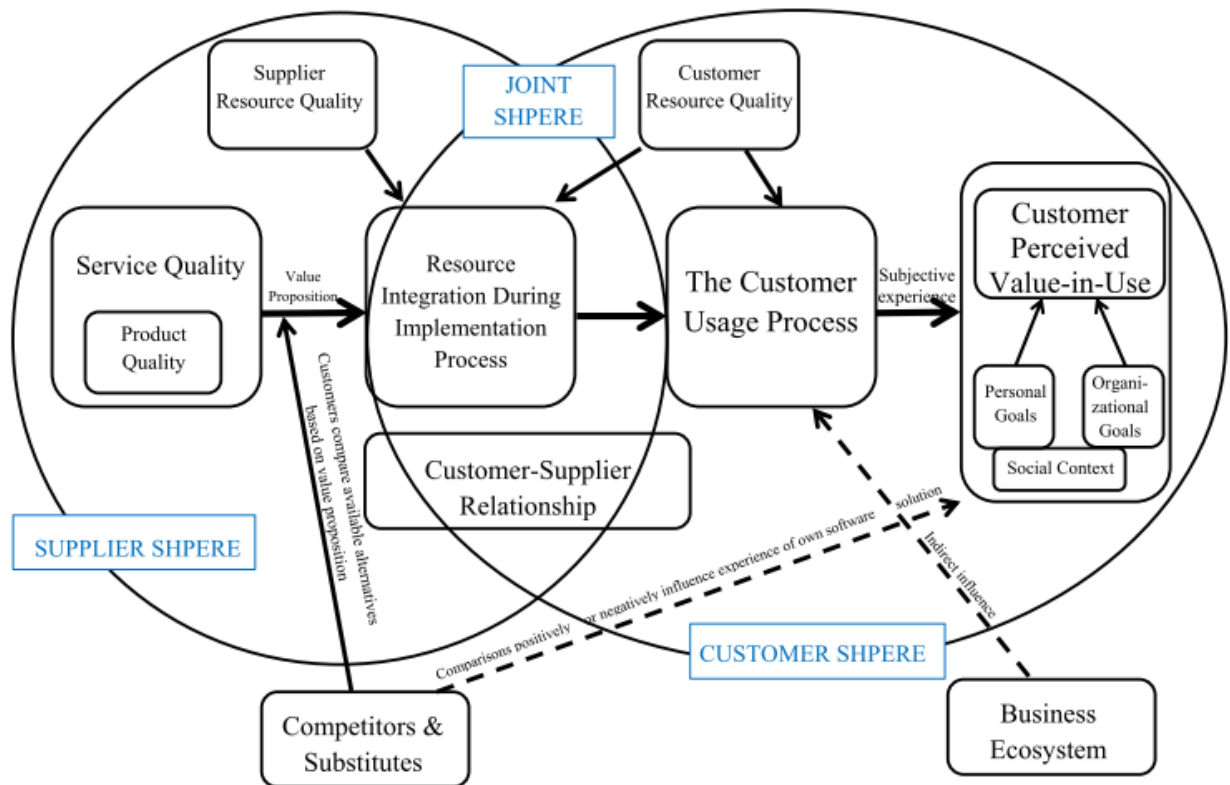


Figure 3: Conceptual Model of the Factors Influential on Customer Perceived Value-in-Use.

As demonstrated in the conceptual model (Figure 3), the supplier only has direct influence on product and service quality and the supplier's resources within the *supplier sphere*. The customer is in charge of the customer usage process, customer resource quality, and the perceived value-in-use is based on individual and organizational goals (*customer sphere*). The resource integration process and the customer-supplier relationship are shared processes among customer and supplier in the *joint sphere*. Since the value spheres are dynamic, the boundaries of in particular the joint sphere can be moved. For instance, the supplier may invite the customer to participate in new product development in the supplier sphere. The other way around, a customer may invite the supplier to test software or provide software trainings at their organization, which offers the supplier the opportunity to influence the customer's usage process in the customer sphere. In addition, the presence of competitors and substitutes influences the customer's buying decision, or may indirectly have a positive or negative influence on the experience of their own software as a result of comparisons with other software options. Furthermore, the customer's value creation process can indirectly be influenced by the customer's surrounding ecosystem, which is beyond the reach of control of the supplier. The value creation process throughout the spheres is not necessarily a linear

process. Value may be created in the different spheres at different periods of time or in different sequences.

4.2 Customer vs. Supplier Perspective on Value-in-Use

In this section, the previously described customer perspective on value-in-use of software solutions will be compared with the supplier perspective. In total, five employees with different job functions (i.e. CEO, Product Manager, Service Manager, Implementation Consultant, Software Engineer) of the supplier organization Topicus Overheid have been interviewed (see Table 5). Overall, the supplier interviewees agreed that the identified factors – customer usage process, product quality, service quality, implementation process, the customer-supplier relationship, business ecosystem, and substitutes – are influential on customer perceived value-in-use. However, differences can be found among the customer perspective and the supplier perspective with regard to which factors are more influential than others. Based on a five point Likert scale ranging from 1 (not important), 2 (of little importance), 3 (moderately important), 4 (important) to 5 (very important), all interviewees have been requested to rate the importance of the respective factors on value-in-use (tables can be found in Appendix II).

The interview results show that, on average, the group of customer interviewees attach relatively higher importance ratings to the customer usage process, product quality and business ecosystem, than the group of supplier interviewees. The group of supplier interviewees, on average, attach relatively higher importance ratings to service quality, implementation process and the customer-supplier relationship for customer perceived value-in-use, than does the customer group (see Figure 4). The group of customer interviewees and the group of supplier interviewees, on average, yield similar ratings for the importance of competition and substitutes on customer perceived value-in-use. This finding might possibly be explained by the theory on value creation spheres by Grönroos & Voima (2013; see section 2.5). From a supplier perspective – whom according to S-D logic only is a creator of potential value-in-use, while the customer is in charge of the value-creation process – service, the implementation process, and the customer-supplier relationship are the only tools the supplier can use to co-create value and optimize the customer perceived value-in-use in the joint sphere. Similarly, the customer might assume the customer usage process, product quality and business ecosystem to be of most influence to value-in-use because they are in control of the

choice of product (quality), the usage process, and their position in the business ecosystem. This particularly concerns the usage process (highest rating of 4.6) wherein the customer creates value-in-use independently of the supplier in the customer sphere. In addition, the impact of service, the implementation process, and the customer-supplier relationship depends on the supplier's ability to engage in active dialogue and collaborate as well as the personal connection. These three factors concern dyadic or reciprocal relationships, and its contribution to value-in-use can thus not be controlled by one party. This might be the reason why, from a customer perspective, value-in-use is most influenced by the usage process, followed by product quality and the customer-supplier relationship.

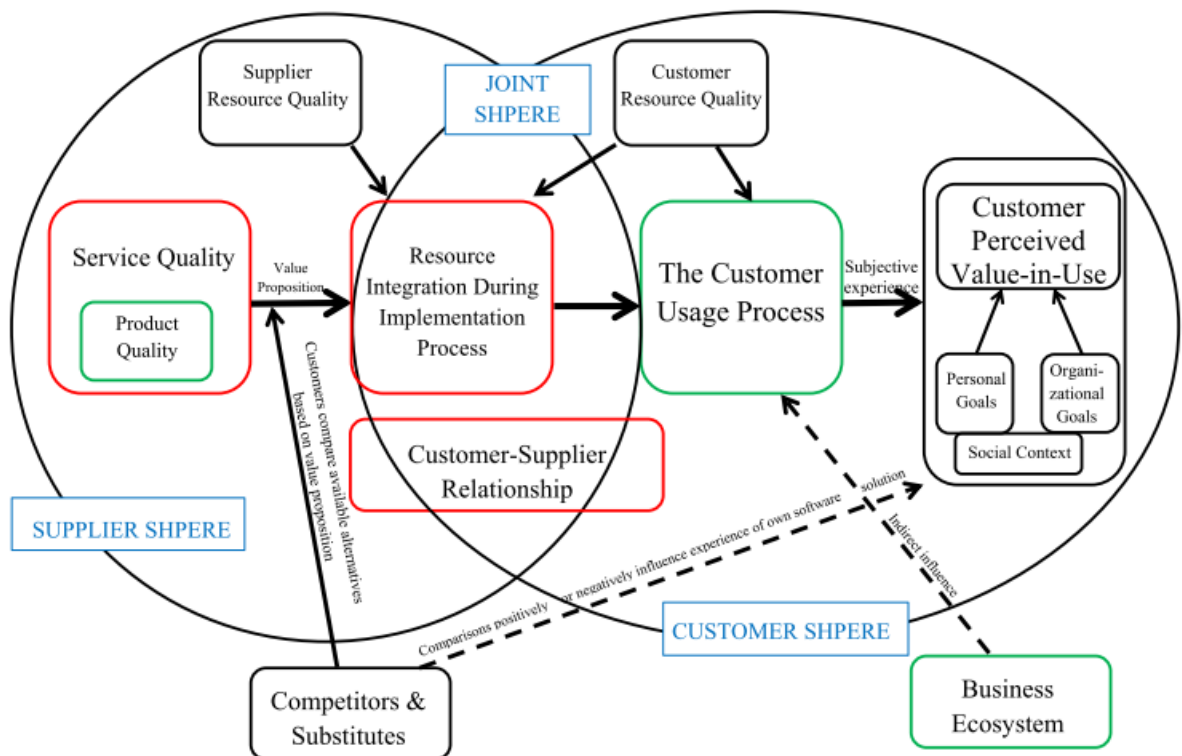


Figure 4: Conceptual Model of the Most Influential Factors on Value-in-Use According to Customer and Supplier Perspective.

Red = Most influential factors according to supplier interviewees.

Green = Most influential factors according to customer interviewees.

In the following, the aspects where the supplier perspective on value-in-use deviates from the customer perspective will be illustrated. Many municipalities feel that the Dutch government could have better prepared the municipalities for their new tasks and responsibilities in the social domain and argued that the decentralization has been enacted too fast. This resulted in a feel of chaos for many municipalities due to the lack of clarity of how

to deal with the decentralization. The supplier interviewees agreed that the transition has indeed been chaotic and stressful to many municipalities (e.g. S2, S4, S5). *"The municipalities have tried to do their best, without actually knowing what is best"* (S4). Supplier 3 highlights that a number of municipalities may have underestimated the execution of the transition in the social domain and states that *"providing social support and allocating (health)care is quite difficult for an organization that used to be responsible for the enactment of laws and procedures only"*. In addition, supplier 1 emphasizes that *"many municipalities started acting too late"*. In 2013 it has been announced that the decentralization would be enacted by January 2015, followed by a policy of tolerance. Thus, municipalities are not forced by the government to organize the process by 2015. This provides municipalities with the opportunity not to respond, which leads to two types of problems for suppliers of software solutions. First, some municipalities acquired software although they did not have functional processes in place or well-organized plans to deal with the decentralization. *"If things do not work out well then, the software often is being accused of it"* (S1). Secondly, due to the procrastination, some municipalities are not yet experiencing any problems, while the supplier has – partially in cooperation with leading municipalities – developed detailed processes and plans to organize the transition of the social domain. *"Then we offer a solution to a problem that does not even exist from their point of view"* (S1). *"Some municipalities still have no system in place and register for example in Excel. I believe, many municipalities did not really know how to respond. Besides having a software system, also new processes have to be designed, that is the main struggle. But, by now, most municipalities do have found a strategy to cope with it"* (S5). To date, the government is exercising more pressure and municipalities are choosing a coping strategy. Based on the coping strategy, processes can be developed, and based on the processes the software can be designed. *"It has been difficult to know how to act or fulfil customer needs as a software supplier in the past two years. Some municipalities did not act or make choices, while others were still searching for a suitable organizational design. Because of that, their needs of the software solution were not clearly specified"* (S1).

As described in section 4.1.1, most municipalities have similar goals and expectations for software solutions (see Table 6). In general, when being asked about the goals and expectations customers have about the software solution, the supplier interviewees named the same as the customer interviewees did. *"Primary goals relate to document creation and the support of the work process"* (S2). When the primary goals are being fulfilled customers demand more of the system, such as management information. *"Management information assists in planning and budgeting purposes. How many FTE do we need? How many cases*

are we working on?" (S2). The supplier interviewees also agreed that a distinction can be made among personal and organizational goals, that the goals are interconnected, and that goals and goal hierarchies change over time. According to the supplier interviewees, personal goals relate to an operational focus – a user friendly system that supports the local district teams to do their work well –, while organizational goals relate to a focus on policy-making, processes, compliance with laws and regulations, financial accountability, and efficiency. However, a difference can be found with regard to the hierarchy of goals. The supplier interviewees showed a stronger focus on the importance of personal goals of staff employees, while a majority of customer interviewees argued that organizational goals should have priority. Supplier interviewee 3 also recognized the difficulty of aligning the goals: *"The goals are interconnected, but it often turns out to be difficult to find a balance between what is important for the user and what is important for the organization"*. In addition, the supplier interviewees emphasized the importance of the role of the functional IT analyst as a connector between the supplier organization and the software users. The functional IT analyst should have a thorough understanding of the daily tasks of the local district teams in order to design and adjust the software properly to the work process. If a functional IT analyst has an insufficient understanding of the work process, the software will likely not be well configured, which would negatively affect the user experience of the software. From this section, the following propositions can be derived:

Proposition 8a: Supplier and customers both consider the six factors - customer usage process, product quality, service quality, implementation process, the customer-supplier relationship, business ecosystem, and substitutes – to be influential on customer perceived value-in-use

Proposition 8b: Supplier and customers attach different weight of importance to the influence of each of the six influential factors

Proposition 8b1: Customers consider factors they have most control of to be most influential on value-in-use, which are customer usage process, product quality and business ecosystem.

Proposition 8b2: The supplier considers factors that enables them to indirectly influence the customer's value creation process to be most influential on customer perceived value-in-use, which are service quality, implementation process and the customer-supplier relationship.

Proposition 8c: While customers tend to prioritize organizational goals over personal goals, the supplier shows a stronger focus on personal goals in the goal hierarchy.

Proposition 8d: The supplier emphasizes the role of the functional IT analyst as a connector between the customer organization and supplier to be an additional determinant of value-in-use.

4.3 The Municipality's Attitude and its Influence on Value-in-Use

4.3.1 *Proactive vs. Reactive Municipalities*

Based on the case study results, two dominant municipality attitudes towards the decentralization in the social domain are identified: “*proactive*” and “*reactive*” municipalities (see Table 7). A municipality's attitude seems to determine the coping strategy. First, the municipalities with a *proactive attitude* towards the decentralization, are municipalities that tend to be willing to innovate and focus on continuous development of their work processes. The proactive municipalities actively responded to the decentralization in a solution-oriented manner. These municipalities aim to be advanced and leading municipalities in the social domain, and in order to achieve this, they tend to collaborate with the software supplier in product- and process-development. Overall, the proactive municipalities tend to embrace the idea of the decentralization, favor the concept of chain integration, and emphasize the importance that the citizen will be centralized, is provided access to the system, can control what happens with their data and who is authorized to access their data. In general, the proactive municipalities are medium to large sized, or are smaller municipalities that have formed cooperations with other small municipalities for the new tasks and responsibilities in the social domain.

Secondly, the municipalities with a *reactive attitude* towards the decentralization, are smaller municipalities which tend to follow the trends set by the proactive municipalities regarding policy-making and process design. The reactive municipalities tend not to participate in co-creation or be in active contact with the supplier. This group of municipalities has found a way to perform the new tasks and responsibilities in the social domain as requested by the government, but are yet less engaged to open up the system to citizen (and other business ecosystem participants besides the supplier) and truly centralize the citizen. Instead, these municipalities tend to have a more internal focus, and are (still) occupied to manage the interorganizational changes in response to the decentralization. The reactive municipalities process the changes at a slower pace (partly due to lower financial and human resource capacity) and feel that the government has enacted the decentralization too fast. The differences among the proactive and reactive attitude towards the decentralization appear to be mainly due to the size and corresponding available budget and FTEs of the municipalities. However, as demonstrated by the municipal cooperations, it is also for smaller municipalities possible to be proactive. Thus, it appears that also the municipality's willingness to change and innovate influences the coping strategy with the decentralization.

Table 7 presents a summary of the key characteristics based on which a municipality's attitude in the social domain can be classified as proactive or reactive.

It seems that the proactive or reactive attitude of municipalities can be related to more characteristics and demographics. A detailed overview of the statistics that have been taken into consideration to find differences in the characteristics per municipality type can be found in Appendix III. In each table, the blue and grey shading respectively represent the proactive standalone municipalities and municipal cooperations. The reactive municipalities have a white shading. The most outstanding differences in the characteristics will be demonstrated in the following sections.

As stated previously, the municipality's size by population (see Table 4) appears to be related to the municipality's attitude. This finding can be further supported by the fact that the budgets that municipalities receive by the government for the social domain is determined by the number of inhabitants. As demonstrated in table 10, each budget is based on an estimation of the funds necessary in youth care, WMO, and participation per person. As a result, municipalities with most inhabitants, or high budget allocations per person (i.e. municipality 5), tend to have relatively higher budgets. In general, the three proactive standalone municipalities have the highest budgets (€74 mln. to €363 mln.), followed by the municipal cooperations (€19 mln. to €32 mln.). The group of reactive municipalities have relatively lower budgets, ranging from €11 mln. to €25 mln. In addition, the growth by population is displayed in table 11. As can be observed, the proactive standalone municipalities are municipalities that are growing, while the cooperative municipalizes also tend to have a low growth rate or shrinkage. The reactive municipalities show different results ranging from shrinkage to growth. Moreover, the proactive standalone municipalities show the highest criminality rates, ranging from 8,3% to 13,25%, compared to the municipal cooperations (2,8% to 7,6%) and the reactive municipalities (2,3% to 4,5%) (see Table 16). Criminality rates are assumed to be aligned with municipality size, population density, and unemployment.

Furthermore, it seems that the proactive municipalities, in particular the standalone municipalities, tend to have a more progressive political orientation compared to the group of reactive municipalities (see Table 12). It was chosen to include not only the recent election results of 2017 but also of 2012 as one of the major progressive Dutch political parties, PvdA, faced an historical low during the 2017 elections. In 2017, the party lost 29 seats in the House of Representatives, resulting in only nine seats. The loss can be explained by the incredibility

of the party's election campaign program in which it attacked the program of the right-conservative party VVD, although the left party had actively collaborated with the VVD during the past four years. In addition, the party leader, Samsom, resigned during the election campaign and Asscher became the new party leader. All in all, voter disappointment in the PvdA party after the elections of 2012 has greatly influenced the 2017 elections (NOS, 2017). In this research, it is assumed that 2012 PvdA voters did not vote again for this party in 2017 due to disappointment in the way the party has acted but not because the voters would not share the values of the party. Moreover, the 2017 election results for the proactive standalone municipalities show lower majorities for the first party compared to the other municipalities. Back in 2012, these municipalities voted for the PvdA as first party with majority percentages ranging from 29,6% to 31,8%. To compare, in 2017, there was more dispersion as these three municipalities voted the VVD as first party with only a 16,3% to 17,4% majority of votes (other municipalities in 2017 voted the respective first party with over 23% of votes).

The next points can be traced to the new tasks and responsibilities in the field of WMO and participation. Considering Table 13, the proactive standalone municipalities show relatively higher unemployment rates (6,7% to 11,1%) compared to the municipal cooperations (4,5% to 5,5%) and the reactive municipalities (4,5% to 5,3%). Additionally, also the youth unemployment rates are the highest in the proactive standalone municipalities, ranging from 12,5% to 18,5%. Also the number of persons with financial state support is relatively higher for the proactive standalone municipalities (4,6% to 10,2%) compared with municipal cooperations (1,2% to 2,7%) and the reactive municipalities (1,4% to 2,6%). Furthermore, the number of inhabitants with paid jobs (i.e. participation) is relatively lower for proactive standalone municipalities (630 to 767 persons per 1000 inhabitants) compared to the municipal cooperations (777 to 797 persons per 1000 inhabitants), and the reactive municipalities (794 to 815 persons per 1000 inhabitants). Moreover, the proactive standalone municipalities show an above country average number of inhabitants with mental health care, while the municipal cooperations and reactive municipalities show numbers below the country average of 3,7% (see Table 14). Municipality 5 with 8,7% is an exception here, which likely explains the relatively higher budget allocated to this municipality in WMO and Participation (Table 10). Interestingly, the number of inhabitants with home nursing is relatively higher for the reactive municipalities (3,6% to 4,6%) and municipal cooperations (2,9% to 3,8%), compared to the proactive standalone municipalities (2,7% to 3,5%). This might be related to the fact that the growth (VINEX) municipalities likely have inhabitants of

lower age on average, while in the smaller municipalities elderly tend to live as long as possible at home with assistance of home nursing.

Finally, the following points can be traced to the new tasks and responsibilities in the field of Jeugdwet. Although the differences are not large, the reactive municipalities show numbers below country average (10,7%) of inhabitants with youth care, ranging from 8,8% to 10,1%, while the proactive standalone municipalities show numbers between 9,7% and 11,1%. The municipal cooperations show very divergent results between 5,93% and 11,9%. This finding might also be explained by population age and migration of young people from smaller municipalities to larger municipalities. Furthermore, the number of single-parent households is relatively higher for proactive standalone municipalities (6,5% to 10,5%) compared to municipal cooperations (5,1% to 6,8%) and reactive municipalities (4,5% to 5,9%). In line with the earlier mentioned result that overall criminality tends to be higher in the large proactive standalone municipalities, also the number of children, adolescents and young adults with juvenile probation is relatively higher for these municipalities (0,6% to 1,2%). Both, municipal cooperations (0,11% to 0,35%) and reactive municipalities (below 0,4%) score below the country average of 0,5% in this respect. In addition, the number of teen moms is also relatively higher for the proactive standalone municipalities (0,9 to 1,5%), while the municipal cooperations and reactive municipalities score below the country average of 0,5%. Again, municipality 5 is an exception with 0,53% of teen moms, which likely explains the relatively higher budget allocated to this municipality in WMO and Participation (Table 10). Also the number of reported child abuse is relatively higher for proactive standalone municipalities (0,36% to 0,71%), compared to municipal cooperations (0,14% to 0,16%) and reactive municipalities (0,11% to 0,48%). The results of this section can be summarized in the following propositions:

Proposition 9a: Municipalities can be classified as proactive or reactive based on attitude towards the decentralization and corresponding coping strategy.

Proposition 9a1: Proactive municipalities have a tendency to collaborate or co-create and are either medium to large sized standalone municipalities or are cooperations of several small municipalities.

Proposition 9a2: Reactive municipalities have an internal focus and tend not to participate in collaborations or co-creation and have a tendency to follow trends set by proactive municipalities in policy-making and process design.

Proposition 9b: Municipality size and corresponding available budget is a determining factor for municipality attitude.

Proposition 9c: Incentive to excel and willingness to change and innovate are a determining factor for municipality attitude.

Proposition 9c1: Proactive municipalities have a higher incentive to excel because they are more challenged by municipality growth and relatively higher rates on unemployment, criminality, mental health care, youth care, child abuse single parent households, and teen moms.

Proposition 9c2: Reactive municipalities have a lower incentive to excel because they are less challenged because they are not expected to grow and have relatively low rates on unemployment, criminality, mental health care, youth care, child abuse single parent households, and teen moms.

Proposition 9c3: The willingness to change and innovate of proactive standalone municipalities appears to be related to a relatively progressive political orientation.

Characteristic	Type of Municipality		
	Proactive		Reactive
	Standalone Municipality	Municipal Cooperation	
Budget for Social Domain	High	Medium (combined value)	Low to medium
Size by Population	Medium to large	Very small to small	Very small to small
Growth by Population	Steady growth (VINEX)	Shrinkage or low growth	Shrinkage or low growth
Political Orientation	Tend to be more progressive compared to the reactive group	Tend to be more conservative compared to the proactive – standalone municipality group	Tend to be more conservative compared to the proactive – standalone municipality group
Unemployment Rate	Above country average	Around country average	Below or around country average
Participation: Inhabitants with Paid Jobs	Below or slightly above country average	Above country average	Above country average
Number of Persons with Financial State Support	Above country average	Below country average	Below country average
Single-Parent Households	Above or slightly below country average	Below country average	Below country average
Number of Inhabitants with Youth Care	Above or slightly below country average	Below or above country average	Below country average
Number of Inhabitants with Mental Health Care	Above country average	Below country average	Below country average
Number of Inhabitants using Home Nursing	Below country average	Around country average	Above country average
Children, Adolescents and Young Adults with Juvenile Probation	Above country average	Below country average	Below country average

Table 7: Summary of Key Characteristics of Proactive and Reactive Municipalities in the Social Domain.

4.3.2 Implications of Municipality Attitude for Perceived Value-in-Use

As introduced in the previous sections, the proactive standalone municipalities, followed by the municipal cooperations, tend to be of larger size by population and are allocated higher budgets for the social domain. The differences in budget are in line with the relative number of inhabitants that are in need of support and care within the social domain. For instance, the numbers and percentages for unemployment, financial state support, mental care, youth care, single-parent households, teen moms, reported child abuse, and children, adolescents and young adults with juvenile probation are relatively higher for the proactive municipalities (in particular the standalone) compared to the reactive municipalities. Correspondingly, these municipalities need a higher capacity in the social domain than the reactive municipalities because the number of inhabitants and also the number of requests for support and care are much higher. As a result, the proactive municipalities have a higher (operational and financial) incentive to increase process efficiency. In general, the proactive municipalities appear to have a tendency to cope with the new challenges by collaborating with either the supplier or other municipalities. Overall, the proactive municipalities are more committed to the decentralization and aim to find best practice strategies to cope with it. The tendency of the proactive municipalities to act in collaborations might be supported by the relatively more progressive political orientation compared to the reactive municipalities, which tend to be relatively more conservatively oriented (see Table 12). In general, the reactive municipalities tend to process the decentralization at a slower pace and fulfil government's demands regarding the new tasks and responsibilities by minimally changing their existing processes. This might be traced to the fact that they are less challenged due to a lower number of requests by citizen, lower available budget and human resources, but possibly also due to the comparatively more conservative political orientation. As a result, the reactive municipalities are less committed to change and innovations in the new domain.

The different attitudes turn out to be an additional factor affecting customer perceived value-in-use of software solutions. Namely, proactive and reactive municipalities create value differently and in different spheres, and correspondingly have different expectations of supplier. First, the proactive standalone municipalities explicitly choose a supplier that is innovative, and has an open attitude towards chain integration and further development of the software, while also sharing their innovative values and proactive way of thinking. These municipalities are looking for a partner to collaborate with to steer advancements in the social domain. This implies that the customer invites the supplier to co-create value in the joint

sphere, and maybe also partly into the customer's usage process in the customer sphere. This also means that it is at these municipalities where the supplier can exercise most influence on the customer's value creation process, and thus on perceived value-in-use. For these municipalities, the degree to which the supplier is flexible to change and open to collaboration, co-development, and co-creation, can positively or negatively influence perceived value-in-use. The software supplier could use its value proposition to be (1) more appealing than other suppliers in the software acquisition phase, and (2) to achieve higher customer perceived value-in-use. Thus, in order to optimize the perceived value-in-use of municipalities that are classified as proactive standalone municipalities, the supplier should emphasize collaboration, co-creation and innovation in its value proposition.

Proposition 10a: Municipality attitude influences the customer's value creation process and expectations of the supplier's role in the value creation process.

Proposition 10b1: Proactive standalone municipalities tend to invite the supplier to co-create value in the joint sphere and/or customer sphere and thereby allow the supplier to indirectly influence the customer's value creation process.

Proposition 10b2: A value proposition emphasizing innovation and the possibility to co-create tends to be more appealing to proactive standalone municipalities and positively influences value-in-use.

Secondly, the reactive municipalities in this study also opted for an innovative software supplier offering the opportunity of chain integration, but in practice, these municipalities barely use these options. These municipalities have a rather internal focus and are comparatively less committed to innovation and developments in the social domain. These municipalities tend to view the supplier as a facilitator of the new processes and do not actively cooperate with supplier besides the implementation process. Thus, here the customer remains in sole control of the value-creation process and the supplier has no influence on the value-in-use arising from the customer's usage process. The supplier's influence is limited to the supplier sphere, meaning that the supplier can only influence product and service quality, supplier resources and do its best during the implementation process. These municipalities are looking for a software supplier that can facilitate their new work processes by delivering a high quality and intuitive software solution and provide necessary service and assistance when needed. The only way how the supplier could optimize the perceived value-in-use is by optimizing the potential value-in-use, which is product and service quality. Regarding the

value proposition, the supplier should emphasize product and service quality to be most appealing to the group of reactive municipalities.

Proposition 10c1: Reactive municipalities view the supplier as a facilitator and do not invite the supplier to co-create.

Proposition 10c2: Reactive municipalities have sole control over the value creation process and the supplier has no influence on the value-in-use arising from the customer usage process.

Proposition 10c3: A value proposition emphasizing product and service quality tends to be more appealing to reactive municipalities and positively influences value-in-use.

Third, the proactive municipal cooperations appear to be a kind of hybrid of the former two. These municipalities are open to advancements and development in the social domain and are like the proactive standalone municipalities trying to find best practice solutions to deal with the decentralization. However, these municipalities do not actively collaborate with to supplier to achieve that, but choose to collaborate with peer municipalities. Similar to the reactive municipalities, the supplier's influence is limited to the supplier sphere as the customer does not invite the supplier to collaborate. But, the customer does allow other ecosystem players (i.e. municipal cooperation partners) influence the usage process. In many cases, not all cooperative municipalities use the same software. Thus, for these municipalities it is of importance that connections and linkages with the systems of other municipalities can be easily established. These municipalities also view the supplier as a facilitator of the new processes and try to improve those processes by collaborating with peers. Similar to the reactive municipalities, the supplier can in this case only optimize the potential value-in-use by offering a high quality software solution and provide superior service in establishing connections with other software systems. Regarding the value proposition, the supplier should emphasize product and service quality as well as the opportunity to easily connect with other systems to be most appealing to the group of municipal cooperations.

Proposition 10d1: Proactive municipal cooperations tend to invite other ecosystem players, but not the supplier, to collaborate in the usage process and thereby influence the customer's value creation process.

Proposition 10d2: A value proposition emphasizing product quality, flexibility, freedom of design and superior service in establishing connections with other software systems tends to be more appealing to proactive municipal cooperations and positively influences value-in-use.

5. Discussion and Conclusion

5.1 Key Findings and Contributions to Theory

Since customer-perceived value-in-use is largely determined by the degree to which customer goals are achieved and functional outcomes are met throughout the customer usage process, the empirical research process started by identifying those goals. In general, municipalities tend to prefer an integral software solution that supports and structures the new processes from start to end, including back office tasks, and fits with the “*I family, I plan, I supervisor*” objective. Furthermore, customers want a software solution which enables a secured exchange of information and data, centralized document creation and storage of client information, different authorization modes for all participants involved, management information for budgeting and planning purposes, connections with other (existing) software systems, financial accountability, and a user friendly and intuitive system.

In line with earlier studies (Ulaga and Eggert, 2006; Epp & Price, 2011; Meynhardt et al., 2016; Macdonald et al, 2016), the empirical results of this study confirm that value-in-use can indeed be traced to both personal and organizational goals. For the social domain of municipalities it was found that the personal goals related to software solutions can be divided into three categories based on job level: (1) staff employees, (2) technical staff, and (3) management. Similar to the assumptions of goal theory as posed by Woodruff (1997) both choice of software and perceived value-in-use are based on goal hierarchies, which tend to differ per person and job function. Furthermore, goals and the hierarchy of goals change over time, and the goals tend to be interconnected. In particular, certain primary goals from an organizational perspective such as compliance with law or safeguarding data privacy should be served first afore attention can be paid to the personal goals. This in turn can be related to findings by Helkkula et al. (2012) that value in experience is subjective and determined by the individual’s social context.

In total, six factors that are influential to customer perceived value-in-use have been identified. First, product and service quality are the basic building blocks of the potential value-in-use (Grönroos, 2011a; Ballantyne & Varey, 2006) that the customer can obtain during the usage process. Both, product and service quality are found to be positively related with customer perceived value-in-use. Thereby, service allows the supplier to influence the customers value creation process, which confirms theories proposed by Grönroos & Voima (2013), Schembri & Sandberg (2002), and Grönroos & Gummerus (2014), amongst others.

Second, the integration process of supplier and customer resources during the implementation of the software solution appears to be of relatively low impact on the value-in-use perceived by staff employees, while it is of relatively high positive influence on the value-in-use perceived by technical staff employees. This can be traced to the earlier contribution that the value-in-use experienced is subjective and related to job role. Third, the value-in-use perceived through the customer usage process is directly influenced by the quality of customer resources and process design. It seems that in ecosystems that are subject to change – like the social domain of municipalities –, customers tend to be more willing to collaborate with the supplier in process design or co-development of the software. Such close customer contact and collaborations increase the supplier's indirect influence on the customer usage process. Fourth, the customer-supplier relationship mainly concerns the relationship between the municipality's technical staff and the supplier organization. As a result, the customer-supplier relationship is of relatively low impact on the value-in-use perceived by staff employees, and is of relatively high influence on the value-in-use perceived by technical staff employees. Again, due to the fact that the social domain is very young and subject to change, customers highlighted the importance of the customer-supplier relationship for steering system improvements and development through user feedback and collaborations. Fifth, it was found that the technical as well as communicative functionality of the business ecosystem has a positive influence on value-in-use on an organizational level, and a comparatively lower positive influence on the perceived value-in-use on a personal level. It is assumed that the functionality of the business ecosystem is especially important in case of chain integration through an integral software solution because of the interdependence of the participants in performing their tasks. Finally, the sixth influential factor concerns competition and substitutes. Namely, depending on comparisons with available substitutes customer makes, he or she has a better or worse feeling about the own choice of software which ultimately leads to a respectively higher or lower perceived value-in-use. The differences in value-in-use perceived and experienced based on job level (i.e. technical staff vs. staff employees) for the implementation process, customer-supplier relationship and business ecosystem functionality, can be considered a confirmation of the findings by Helkkula et al. (2012) that a customer's sensemaking of value is determined by experiences related to the individual's role and its social context. The six influential factors are summarized in the conceptual model in Figure 3.

Next, a comparison of customer and the supplier perspective on value-in-use revealed that both parties agree that the identified factors are indeed of influence on value-in-use, but assume different factors to be more influential than others. In particular, customers view the

customer usage process, product quality and business ecosystem to be of higher influence compared to the group of supplier interviewees. The suppliers view the service quality, implementation process and the customer-supplier relationship to be of higher influence on customer perceived value-in-use compared to the customer group. Arguing through the lens of S-D logic, it makes sense that customer and supplier argue different factors to be of higher importance to value-in-use. Namely, from a supplier perspective – whom according to S-D logic only is a creator of potential value-in-use, while the customer is in charge of the value-creation process – service, the implementation process, and the customer-supplier relationship are the only tools the supplier can use to co-create value and optimize the customer perceived value-in-use in the joint sphere. Similarly, the customer views the customer usage process, product quality and business ecosystem to be of most influence to value-in-use because they are in control of the choice of product (quality), the usage process, and their position in the business ecosystem. Thus, it appears that both supplier and customer – unconsciously or not – argue based on their range of influence within the value spheres as introduced by Grönroos & Voima (2013). In addition, the suppliers highlighted the importance of the functional IT analyst's understanding of the work process at the client organization as based on this understanding the software will be configured by the functional IT analyst. The configuration of the software affects the user experience, but is not in the range of control of the supplier.

Furthermore, two dominant municipality attitudes towards the decentralization in the social domain have been identified: *proactive* and *reactive* municipalities (see Table 7). The municipalities with a proactive attitude towards the decentralization are municipalities that tend to be willing to innovate and focus on continuous development of their work processes. Overall, these municipalities embrace the idea of the decentralization, strive to centralize the citizen in the process and provide citizen access to the system, and aim to be advanced and leading municipalities in the social domain. The proactive municipalities have a strong tendency to collaborate in the joint sphere and do this either with the supplier (standalone proactive municipalities) or with peers (municipal cooperations). In contrast, the reactive municipalities are of smaller size and tend to follow the trends set by the proactive municipalities regarding policy-making and process design, and do not participate in co-creation. They perform the new tasks and responsibilities in the social domain as requested by the government, but are yet less engaged to open up the system to citizen (and other business ecosystem participants besides the supplier) and truly centralize the citizen. Instead, these municipalities tend to have a more internal focus, and are (still) occupied to manage the interorganizational changes in response to the decentralization. The reactive municipalities

process the changes at a slower pace and feel that the government has enacted the decentralization too fast.

In addition, it was found that the proactive or reactive attitude of municipalities in the social domain can be related to certain characteristics. Compared to the reactive municipalities, proactive municipalities tend to have a relatively higher budget available for the social domain, larger size by number of inhabitants, higher growth by number of inhabitants, a more progressive political orientation, higher unemployment rate, lower number of inhabitants with paid jobs, higher number of single-parent households, higher criminality rates, higher number of teen moms, higher number of reported child abuse, higher number of children, adolescents and young adults with juvenile probation, as well as a higher number of inhabitants in need of financial state support, mental health care, and youth care, and a lower number of inhabitants in need of home nursing. Correspondingly, the proactive municipalities are also the municipalities that are most challenged by the decentralization as they receive more requests for support and care in the social domain. As a result, they are more committed and have a higher incentive to develop best practices, which likely explains their proactive attitude.

Whether a municipality is active in cooperations with the supplier, peers, or not has an influence on the value-creation process. Thus, the municipality's attitude should be taken into consideration as an additional factor influencing value-in-use. It was concluded that the supplier can exercise most influence on the customer's value creation process – and thus on perceived value-in-use – at proactive standalone municipalities because these municipalities tend to actively collaborate or co-create with the supplier. Since the municipal cooperations and reactive municipalities do not actively collaborate with the supplier, the supplier can barely influence the customer's value creation process. In general, the empirical results of this study are in line with theory on S-D logic as well as the value creation spheres. However, some findings appear to partially conflict with the seventh foundational premise: *The enterprise can only make value propositions* (see Table 1). It appears that concerning software solutions in the social domain of municipalities, the supplier firm is not restricted to offering value propositions, but can indirectly or directly influence the customer's value creation process through service, the customer-supplier relationship and the implementation process. Depending on the type of municipality, the supplier has more or less influence on the value creation process. For the future, it can be assumed that the influence of the supplier will

decline as processes and software will become more standardized and municipalities would have a lower incentive to collaborate.

5.2 Limitations and Recommendations for Future Research

As in any research project, the choices made during the research process contain several limitations which future research should overcome. The most important limitations and recommendations for future research are discussed in the following section.

A major limitation of this research is that the empirical part is based on a single case study of software solutions within the social domain of Dutch local governments, consisting of 17 interviews. Although the interviews provide a general impression about views and opinions of persons from the professional field, the sample size is not sufficient to draw generalized conclusions regarding the value-in-use of software solutions in the social domain. The conclusions that can be drawn from the interview results, are limited to the case study organization and caution should be taken when generalizing the results to different software suppliers and their customers. Especially, because the software suppliers in the social domain have developed very different software solutions (i.e. Topicus focuses on chain integration, which most other suppliers do not) with different options and features. As a result, software suppliers may attract different types of customers, which may be different from the customers included in the sample of this study.

For future research it is recommended to validate the interview findings of this thesis through quantitative research, for example in form of an additional questionnaire. The questionnaire should be distributed over a sufficient sample size of Dutch municipalities so that eventually generalized conclusions can be drawn. In addition, a cross-industry study could be undertaken to compare the software solutions and strategic approaches of other software suppliers. Furthermore, it was chosen to conduct the customer interviews with technical staff employees. For future research, it might be interesting to also investigate the perspective of staff employees such as local district workers on more detail. In addition, this study focused on and is limited to the customer organization perspective (the municipality) of value-in-use. However, concerning the rather complex business ecosystem of the social domain, it might also be compelling to study the value-in-use from a network perspective, or the perspective of citizen. Another recommendation for future research would be to conduct a longitudinal study which focuses on how the value-in-use of software solutions, the

municipality's proactive or reactive attitude, and the supplier's influence on the customer's value creation process changes over time as the social domain becomes more mature. Finally, an interesting recommendation for future research is to investigate the influence of co-creations and collaborations in the joint sphere and its effect on value-in-use in further detail.

5.3 Managerial Implications

This research provides managers with a theoretical foundation of the concept of value-in-use. Based on an extensive literature review and interviews, several influential factors on customer perceived value-in-use have been identified. Due to its focus on the customer perspective, this study provides useful insights to suppliers of software solutions in the social domain of Dutch local governments – in particular to case study organization Topcius Overheid. The insights gained from this study will help managers to develop a greater understanding of the customer perspective on value-in-use and how they can positively contribute to the customer's value creation process.

First of all, managers should be aware of the existence of different goals: organizational goals and personal goals which differ based on job function. The different goals, how they are interconnected and the difficulty of aligning the goals should be beared in mind by managers as customer-perceived value-in-use is largely determined by the degree to which customer goals are achieved and functional outcomes are met throughout the customer usage process. Secondly, managers should be aware that, by definition, the customer is in charge of the value creation process during usage of the software solution, and that the software supplier only has limited influence on this process. Moreover, there are additional factors that influence customer perceived value-in-use, but which are outside the range of control of the supplier: the business ecosystem, quality of customer resources, and the availability of substitute products. However, the supplier organization is in control of product quality, software quality, and the resources it integrates during the implementation process at the customer. Since customers consider the customer usage process, product quality and business ecosystem to be of most influence on value-in-use, it would be wise to focus on these factors. The supplier, thus, could influence the customer usage process by design of the software. For example by offering a very intuitive software design which guides the users through clearly defined process stages. Concerning the business ecosystem, the supplier could take initiative to set up more collaborations among chain partners in the social domain or

bring (potential) chain partners together in information meetings or events. Third, managers should recognize the different needs of different types of customer organizations and adjust their value propositions in a way suitable for each type of municipality in order to optimize the respective value-in-use:

- **Proactive Standalone Municipality:** Emphasize collaboration, co-creation and innovation opportunities in the value proposition.
- **Reactive Municipality:** Emphasize software solution quality and service quality in the value proposition.
- **Municipal Cooperation:** Emphasize the flexibility of the software solution and easy establishment of connections with other (existing) software systems, along with product and service quality.

6. Research Ethics

I confirm that I prepared this thesis independently and that none other than the specified sources and aids were used, and that the sources of literally or in substance extracted text passages have been made apparent by use of citations in the thesis.

Danique Sterenborg

Enschede, 24th of August 2017

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Appendices

Appendix I – Differences between GD logic and SD logic

	G-D Logic	S-D Logic
Value Driver	Value-in-exchange	Value-in-use or value-in-context
Creator of Value	Firm, often with input from firms in a supply chain	Firm, network partners, and customers
Process of Value Creation	Firms embed value in ‘goods’ or ‘services’, value is ‘added’ by enhancing or increasing attributes	Firms propose value through market offerings, customers continue value-creation process through usage
Purpose of Value	Increase wealth for the firm	Increase adaptability, survivability, and system well-being through service of others
Measurement of Value	The amount of nominal value, price received in exchange	The adaptability and survivability of the beneficiary system
Resources Used	Primarily operand resources	Primarily operant resources, sometimes transferred by embedding them in operand resources/goods
Role of the Firm	Produce and distribute value	Propose and co-create value, provide service
Role of Goods	Units of output, operand resources that are embedded with value	Vehicle for operant resources, enables access to benefits of firm competences
Role of Customers	To ‘use up’ or ‘destroy’ value created by the firm	Co-create value through the integration of firm-provided resources with other private and public resources

Source: Vargo, Maglio & Akaka, 2008, p. 148.

Appendix II – Supplier and Customer Perspectives on Factors Influential on Customer Perceived Value-in-Use

Factor	S1	S2	S3	S4	S5	Average Score
Customer Usage Process	3	4	4	4	4	3,8
Product Quality	3	4	5	3	4	3,8
Service Quality	4	3	5	5	5	4,4
Implementation Process	5	5	3	5	5	4,6
Customer-Supplier Relationship	4	5	5	3	5	4,4
Business Ecosystem	4	4	3	3	4	3,6
Competition and Substitutes	1	3	2	4	3	2,6

Table 8: Supplier Perspective on Factors Influential on Customer Perceived Value-in-Use by Relative Importance.

Factor	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	Average Score
Municipality	M1	M2	M3	M4	M5	M5	M7	M7	M8	M6	M10	M9	
Customer Usage Process	4	5	5	5	5	4	4	4	5	5	4	5	4,6
Product Quality	5	5	4	5	4	4	5	5	4	3	5	5	4,5
Service Quality	4	4	4	4	2	2	4	5	4	5	5	3	3,8
Implementation Process	3	4	3	4	5	5	4	4	4	5	4	2	3,9
Customer-Supplier Relationship	3	3	4	3	4	4	3	4	5	3	5	3	3,7
Business Ecosystem	4	5	5	4	5	5	5	5	4	3	4	4	4,4
Competition and Substitutes	4	3	1	4	3	3	4	4	2	1	1	3	2,8

Table 9: Customer Perspective on Factors Influential on Customer Perceived Value-in-Use by Relative Importance.

Appendix III – Municipality Characteristics Data

Municipality	Size Classification	Youth Care in €	WMO in €	Participation in €	Total Budget per Inhabitant in €	Total budget €
Netherlands		230 €	128 €	170 €	528 €	
Municipality 1	Very small	195 €	134 €	106 €	435 €	14.499.855 €
Municipality 2	Very small	123 €	149 €	127 €	399 €	18.843.255 €
Municipality 3	Small	179 €	121 €	138 €	438 €	24.483.874 €
Municipality 4	Very small	183 €	141 €	117 €	441 €	10.576.944 €
Municipality 5	Very small	228 €	204 €	296 €	727 €	24.606.042 €
Municipality 6	Very small	213 €	114 €	130 €	457 €	12.757.612 €
Municipality 7	Medium	296 €	157 €	335 €	788 €	124.780.588 €
Municipality 8	Large	247 €	131 €	198 €	577 €	363.282.662 €
Municipality 9	Small	178 €	109 €	124 €	410 €	32.033.996 €
Municipality 10	Medium	296 €	137 €	161 €	595 €	74.313.120 €

Table 10: Budget for the Social Domain per Municipality

Column 3 – 6: Green shading is below country average; Red is above country average

Column 7: Green shading is high (> €70 mln.); Orange shading is medium (€15 mln – 70 mln); Red is low (> €15 mln)

Source: Binnenlands Bestuur (2015)

Municipality	Size by Number of Inhabitants	Region: COROP	Growth by Population	Growth Classification
Municipality 1	Very small	Achterhoek	-168	Shrinkage
Municipality 2	Very small	Twente	13	Low growth
Municipality 3	Small	Zuidoost-Noord Braband	7	Low growth
Municipality 4	Very small	Veluwe	-11	Shrinkage
Municipality 5	Very small	Twente	93	Growth
Municipality 6	Very small	Noord-Overijssel	91	Growth
Municipality 7	Medium	Twente	109	Growth (VINEX)
Municipality 8	Large	Groot-Rijnmond	2301	Growth (VINEX)
Municipality 9	Small	Zuidoost-Noord Braband	-24	Shrinkage
Municipality 10	Medium	Noord-Overijssel	524	Growth (VINEX)

Table 11: Growth by Population per Municipality
 Source: CBS (2017)

Elections of 2017										
Municipality	Voter Turnout	1st Party	Policial Orientation	% of Total Votes	2nd Party	Political Orientation	% of Total Votes	3rd Party	Political Orientation	% of Total Votes
Municipality 1	70%	VVD	Right - Conservative	27,61%	CDA	Right - Conservative	15,72%	D66	Right - Progressive	14,95%
Municipality 2	67%	CDA	Right - Conservative	39,00%	VVD	Right - Conservative	24,35%	PVV	Middle - Conservative	11,31%
Municipality 3	64%	VVD	Right - Conservative	23,96%	PVV	Middle - Conservative	13,59%	CDA	Right - Conservative	13,57%
Municipality 4	67%	VVD	Right - Conservative	27,02%	CDA	Right - Conservative	18,42%	D66	Right - Progressive	12,42%
Municipality 5	62%	CDA	Right - Conservative	29,32%	PVV	Middle - Conservative	15,56%	VVD	Right - Conservative	14,12%
Municipality 6	67%	CDA	Right - Conservative	31,16%	VVD	Right - Conservative	19,06%	ChristenUnie	Right - Progressive	9,22%
Municipality 7	59%	VVD	Right - Conservative	16,38%	PVV	Middle - Conservative	15,55%	D66	Right - Progressive	13,38%
Municipality 8	52%	VVD	Right - Conservative	16,26%	PVV	Middle - Conservative	16,01%	D66	Right - Progressive	12,61%
Municipality 9	65%	VVD	Right - Conservative	25,30%	CDA	Right - Conservative	14,36%	D66	Right - Progressive	13,24%
Municipality 10	65%	VVD	Right - Conservative	17,44%	D66	Right - Progressive	14,77%	GROENLINKS	Left - Progressive	11,62%
Total Voter Turnout:	63,69%									
Elections of 2012										
Municipality	Voter Turnout	1st Party	Policial Orientation	% of Total Votes	2nd Party	Political Orientation	% of Total Votes	3rd Party	Political Orientation	% of Total Votes
Municipality 1	64,72%	VVD	Right - Conservative	33,25%	PvdA	Left - Progressive	26,04%	CDA	Right - Conservative	10,29%
Municipality 2	61,00%	VVD	Right - Conservative	32,80%	CDA	Right - Conservative	27,56%	PvdA	Left - Progressive	14,31%
Municipality 3	57,91%	VVD	Right - Conservative	28,46%	PvdA	Left - Progressive	20,87%	SP	Left - Progressive	13,76%
Municipality 4	61,73%	VVD	Right - Conservative	31,46%	PvdA	Left - Progressive	24,25%	CDA	Right - Conservative	13,50%
Municipality 5	57,02%	CDA	Right - Conservative	21,93%	PvdA	Left - Progressive	18,81%	VVD	Right - Conservative	18,35%
Municipality 6	62,37%	VVD	Right - Conservative	26,38%	CDA	Right - Conservative	19,64%	PvdA	Left - Progressive	19,38%
Municipality 7	52,09%	PvdA	Left - Progressive	30,88%	VVD	Right - Conservative	19,48%	SP	Left - Progressive	11,61%
Municipality 8	45,02%	PvdA	Left - Progressive	31,83%	VVD	Right - Conservative	20,29%	SP	Left - Progressive	9,85%
Municipality 9	59,27%	VVD	Right - Conservative	30,11%	PvdA	Left - Progressive	20,50%	SP	Left - Progressive	13,25%
Municipality 10	58,01%	PvdA	Left - Progressive	29,55%	VVD	Right - Conservative	19,60%	ChristenUnie	Right - Conservative	10,15%
Total Voter Turnout:	57,91%									

Table 12: Political Orientation per Municipality Based on Elections of 2017 and 2012
Source: NRC (2017)

Municipality	Size Classification	Region: COROP	Total Unemployment	Unemployment Age: 15-25	Unemployment Age: 25-45	Unemployment Age: 45-75	Number of Persons with Financial State Support	Participation: Inhabitants with Paid Jobs; per 1000 Inhabitants
Netherlands			4,9%				4,13%	758
Municipality 1	Very small	Achterhoek	5,3%	10,0%	3,9%	4,9%	2,3%	815
Municipality 2	Very small	Twente	4,5%	8,7%	3,0%	4,1%	1,2%	797
Municipality 3	Small	Zuidoost-Noord Brabant	5,5%	10,0%	4,1%	5,3%	2,7%	777
Municipality 4	Very small	Veluwe	4,5%	8,3%	2,9%	4,4%	2,0%	807
Municipality 5	Very small	Twente	5,3%	9,8%	3,7%	5,1%	2,6%	794
Municipality 6	Very small	Noord-Overijssel	4,5%	9,1%	2,9%	4,2%	1,4%	804
Municipality 7	Medium	Twente	8,6%	13,5%	6,6%	8,5%	7,4%	694
Municipality 8	Large	Groot-Rijnmond	11,1%	18,5%	8,9%	11,4%	10,2%	630
Municipality 9	Small	Zuidoost-Noord Brabant	5,2%	9,5%	3,9%	4,8%	2,7%	789
Municipality 10	Medium	Noord-Overijssel	6,7%	12,5%	5,0%	6,4%	4,6%	767

Table 13: Unemployment, Persons with Financial State Support and Participation per Municipality

Green shading is below country average; Red is above country average

Source: KING (2017)

Municipality	Size Classification	Region: COROP	Number of Inhabitants with Mental Health Care	Number of Inhabitants with Home Nursing	Number of Inhabitants with Long-term Care
Netherlands			3,7%	3,0%	2,2%
Municipality 1	Very small	Achterhoek	3,2%	4,6%	2,9%
Municipality 2	Very small	Twente	3,5%	3,8%	2,2%
Municipality 3	Small	Zuidoost-Noord Braband	3,2%	3,0%	1,8%
Municipality 4	Very small	Veluwe	3,6%	3,8%	3,4%
Municipality 5	Very small	Twente	8,7%	3,6%	2,1%
Municipality 6	Very small	Noord-Overijssel	3,6%	3,7%	1,6%
Municipality 7	Medium	Twente	4,4%	3,5%	2,5%
Municipality 8	Large	Groot-Rijnmond	4,1%	2,7%	2,1%
Municipality 9	Small	Zuidoost-Noord Braband	2,90%	2,94%	1,8%
Municipality 10	Medium	Noord-Overijssel	4,6%	2,9%	2,5%

Table 14 Number of Inhabitants with Mental Health Care, Home Nursing and Long-term Care per Municipality
 Green shading is below country average; Red is above country average
 Source: KING (2017)

Municipality	Size Classification	Region:COROP	Single-Parent Households	Number of Inhabitants with Youth Care	Children, Adolescents and Young Adults with Juvenile Probation	Number of Teen Moms	Reported Child Abuse
Netherlands			7,20%	10,70%	0,50%	0,50%	0,70%
Municipality 1	Very small	Achterhoek	5,00%	10,10%	0,30%	0,21%	0,26%
Municipality 2	Very small	Twente	5,06%	5,93%	0,11%	0,06%	0,14%
Municipality 3	Small	Zuidoost-Noord Brabant	6,81%	11,85%	0,35%	0,13%	0,16%
Municipality 4	Very small	Veluwe	5,10%	10,10%	-	0,44%	0,19%
Municipality 5	Very small	Twente	5,90%	9,20%	0,40%	0,53%	0,48%
Municipality 6	Very small	Noord-Overijssel	4,50%	8,80%	-	0,00%	0,11%
Municipality 7	Medium	Twente	7,30%	9,70%	0,90%	0,88%	0,51%
Municipality 8	Large	Groot-Rijnmond	10,50%	10,70%	1,20%	1,53%	0,71%
Municipality 9	Small	Zuidoost-Noord Brabant	6,75%	10,25%	0,25%	0,19%	0,16%
Municipality 10	Medium	Noord-Overijssel	6,50%	11,10%	0,60%	0,86%	0,36%

Table 15: Single-Parent Households, Number of Inhabitants with Youth Care, Juvenile Probation, Teen Moms, and Reported Child Abuse per Municipality
Green shading is below country average; Red is above country average
Source: KING (2017)

Municipality	Total Registered Criminality	Property Crime and Fraud	Theft	Vandalism and Violence of Public Order	Violence and Sexual Abuse
Municipality 1	1489	650	560	179	100
% of total criminality	100,00%	43,65%	37,61%	12,02%	6,72%
% per inhabitant	4,47%	1,95%	1,68%	0,54%	0,30%
Municipality 2	1093	507	404	97	85
% of total criminality	100,00%	46,39%	36,96%	8,87%	7,78%
% per inhabitant	2,83%	1,07%	1,21%	0,29%	0,26%
Municipality 3	3681	1665	1495	338	183
% of total criminality	100,00%	45,23%	40,61%	9,18%	4,97%
% per inhabitant	6,58%	2,98%	2,67%	0,60%	0,33%
Municipality 4	1049	468	419	86	76
% of total criminality	100,00%	44,61%	39,94%	8,20%	7,24%
% per inhabitant	4,37%	1,95%	1,75%	0,36%	0,32%
Municipality 5	1059	453	386	119	101
% of total criminality	100,00%	42,78%	36,45%	11,24%	9,54%
% per inhabitant	3,13%	1,34%	1,14%	0,35%	0,30%
Municipality 6	644	315	235	52	42
% of total criminality	100,00%	48,91%	36,49%	8,07%	6,52%
% per inhabitant	2,31%	1,13%	0,84%	0,19%	0,15%
Municipality 7	16656	7426	6889	1462	879
% of total criminality	100,00%	44,58%	41,36%	8,78%	5,28%
% per inhabitant	10,52%	4,69%	4,35%	0,92%	0,56%
Municipality 8	83402	37541	34235	5890	5736
% of total criminality	100,00%	45,01%	41,05%	7,06%	6,88%
% per inhabitant	13,25%	5,96%	5,44%	0,94%	0,91%
Municipality 9	5956	2700	2399	566	291
% of total criminality	100,00%	45,33%	40,28%	9,50%	4,89%
% per inhabitant	7,63%	3,46%	3,07%	0,72%	0,37%
Municipality 10	10383	4626	4058	906	793
% of total criminality	100,00%	44,55%	39,08%	8,73%	7,64%
% per inhabitant	8,31%	3,70%	3,25%	0,73%	0,63%
Sample total	125412	56351	51080	9695	8286

Table 16: Registered Criminality per Municipality

Green shading is low (< 4,5%); Orange shading is medium (4,5% to 8%); Red is high (> 8%).

Source: CBS (2016)

Appendix IV – Overview of the Propositions

Subject	Propositions derived from theory	Propositions derived from case study
Individual vs. Collective Value-in-Use	<p>Proposition 1a: The value-in-use of software solutions is determined based on interconnected individual and organizational goals which change over time and tend to be organized in goal hierarchies.</p> <p>Proposition 1b: The value-in-use of software solutions is determined by subjective customer experiences.</p>	<p>Proposition 1a: The value-in-use of software solutions is determined based on interconnected individual and organizational goals which tend to be organized in goal hierarchies.</p> <p>Proposition 1a1: Goal hierarchies tend to differ based on job function.</p> <p>Proposition 1a2: The position of goals in goal hierarchies tend to change over time based on goal fulfilment or unfulfilment.</p> <p>Proposition 1b: The value-in-use of software solutions is determined by subjective customer experiences.</p>
Service and Product Quality	<p>Proposition 2a: Product quality and customer perceived value-in-use of the software solution are positively related.</p> <p>Proposition 2b: Service quality and customer perceived value-in-use of the software solution are positively related.</p>	<p>Proposition 2a: Product quality and customer perceived value-in-use of the software solution are positively related.</p> <p>Proposition 2b: Service quality customer perceived value-in-use of the software solution are positively related.</p> <p>Proposition 2c: Most customers value product quality over service quality.</p> <p>Proposition 2d: In immature industries that are subject to change and development, service quality is of higher importance.</p>
Integration Process of Supplier Resources and Customer Resources	<p>Proposition 3: The integration process of supplier and customer resources is positively related to the customer perceived value-in-use of the software solution.</p>	<p>Proposition 3a: The integration process of supplier and customer resources during the implementation of the software solution is of relatively low impact on the value-in-use perceived by staff employees because they are not directly involved in the implementation process.</p> <p>Proposition 3b: The integration process of supplier and customer resources during the implementation of the software solution is of relatively high influence on the value-in-use perceived by technical staff employees because they are actively involved in the implementation process.</p> <p>Proposition 3c: The implementation process serves as a first impression of the supplier at the customer organization and influences future judgement or opinion about the supplier.</p> <p>Proposition 3d: Process design, user motivation and acceptance determine the success of the software solution at the customer organization after the implementation.</p> <p>Proposition 3e: The implementation process requires guidance of the supplier on both technical aspects as well as education and supervision of users.</p>
Customer Usage Process	<p>Proposition 4a The quality of the value-in-use perceived is based on the customer's experience and</p>	<p>Proposition 4a: The quality of the value-in-use perceived is based on the customer's experience and interpretation of goal fulfilment during the usage process.</p> <p>Proposition 4b: The quality of the value-in-use perceived during the customer usage process is directly</p>

	<p>interpretation of goal fulfilment during the usage process.</p> <p>Proposition 4b: The quality of value-in-use perceived during the usage process is directly influenced by the quality of customer resources.</p>	<p>influenced by the quality of customer resources and process design.</p> <p>Proposition 4c: The heterogeneity in PC skills and registration habits of users are considered to be the most influential client resources on the perceived value-in-use during the usage process.</p> <p>Proposition 4d: The supplier may indirectly influence the value-in-use perceived by the customer during the usage process through intuitive software design, close customer contact, collaborations or co-creation.</p> <p>Proposition 4e: In immature ecosystems that are subject to change, customers appear to be more willing to collaborate with the supplier, which increases the supplier's ability to indirectly influence the customer usage process.</p>
The Customer-Supplier Relationship	<p>Proposition 5a: The customer-supplier relationship as well as joint problem-solving processes are positively related to the customer perceived value-in-use of the software solution.</p> <p>Proposition 5b: Through active dialogue and interaction with the customer, the supplier may indirectly influence the usage process.</p>	<p>Proposition 5a: The customer-supplier relationship is of relatively high influence on the perceived value-in-use of technical staff, because it mainly concerns the link between the functional IT analyst and the supplier.</p> <p>Proposition 5b: The customer-supplier relationship has a low impact on the value-in-use perceived by staff employees because they have no direct relationship with the supplier.</p> <p>Proposition 5c: A good customer-supplier relationship and joint problem solving processes can be a supportive factor to improve the usage process and increase perceived value-in-use.</p>
The Business Ecosystem	<p>Proposition 6: The technical as well as communicative functionality of the business ecosystem is positively related to the customer perceived value-in-use of the software solution.</p>	<p>Proposition 6a: An integrated software solution is considered a tool to better cooperate and yield quality improvement in the business ecosystem .</p> <p>Proposition 6b: Privacy issues are considered the biggest hurdle as a result of the complexity associated with an integrated software solution in a business ecosystem.</p> <p>Proposition 6c: Both technical and communicative functionality of the business ecosystem positively contributes to the value-in-use on an organizational level.</p>
Competition and Substitute Products	<p>Proposition 7: The presence of substitute products and services by alternative suppliers influences the customer perceived value-in-use of the software solution.</p>	<p>Proposition 7a: Due to the presence of substitute products and service, customers make comparisons which leads to a better or worse feeling about their own choice of software, which in turn yields a respectively higher or lower perceived value-in-use of the software solution.</p> <p>Proposition 7b: The role of competition and substitutes is phase dependent.</p> <p>Proposition 7b1: The role of competition and substitutes increases if the customer is about to acquire a software solution or if the contract with the current software supplier is close to termination.</p> <p>Proposition 7b2: The role of competition and substitutes declines when the customer organization has chosen a particular software system.</p>
Customer vs.	-	<p>Proposition 8a: Supplier and customers both consider the six factors - customer usage process, product quality, service quality, implementation process, the customer-supplier relationship, business ecosystem,</p>

Supplier Perspective on Value-in-Use		<p>and substitutes – to be influential on customer perceived value-in-use</p> <p>Proposition 8b: Supplier and customers attach different weight of importance to the influence of each of the six influential factors</p> <p>Proposition 8b1: Customers consider factors they have most control of to be most influential on value-in-use, which are customer usage process, product quality and business ecosystem.</p> <p>Proposition 8b2: The supplier considers factors that enables them to indirectly influence the customer's value creation process to be most influential on customer perceived value-in-use, which are service quality, implementation process and the customer-supplier relationship.</p> <p>Proposition 8c: While customers tend to prioritize organizational goals over personal goals, the supplier shows a stronger focus on personal goals in the goal hierarchy.</p> <p>Proposition 8d: The supplier emphasizes the role of the functional IT analyst as a connector between the customer organization and supplier to be an additional determinant of value-in-use.</p>
Municipality Attitude	-	<p>Proposition 9a: Municipalities can be classified as proactive or reactive based on attitude towards the decentralization and corresponding coping strategy.</p> <p>Proposition 9a1: Proactive municipalities have a tendency to collaborate or co-create and are either medium to large sized standalone municipalities or are cooperations of several small municipalities.</p> <p>Proposition 9a2: Reactive municipalities have an internal focus and tend not to participate in collaborations or co-creation and have a tendency to follow trends set by proactive municipalities in policy-making and process design.</p> <p>Proposition 9b: Municipality size and corresponding available budget is a determining factor for municipality attitude.</p> <p>Proposition 9c: Incentive to excel and willingness to change and innovate are a determining factor for municipality attitude.</p> <p>Proposition 9c1: Proactive municipalities have a higher incentive to excel because they are more challenged by municipality growth and relatively higher rates on unemployment, criminality, mental health care, youth care, child abuse single parent households, and teen moms.</p> <p>Proposition 9c2: Reactive municipalities have a lower incentive to excel because they are less challenged because they are not expected to grow and have relatively low rates on unemployment, criminality, mental health care, youth care, child abuse single parent households, and teen moms.</p> <p>Proposition 9c3: The willingness to change and innovate of proactive standalone municipalities appears to be related to a relatively progressive political orientation.</p>
Implications of Municipality	-	<p>Proposition 10a: Municipality attitude influences the customer's value creation process and expectations of the supplier's role in the value creation process.</p> <p>Proposition 10b1: Proactive standalone municipalities tend to invite the supplier to co-create value in the joint sphere and/or customer sphere and thereby allow the supplier to indirectly influence the</p>

Attitude for Value- in-Use		<p>customer's value creation process.</p> <p>Proposition 10b2: A value proposition emphasizing innovation and the possibility to co-create tends to be more appealing to proactive standalone municipalities and positively influences value-in-use.</p> <p>Proposition 10c1: Reactive municipalities view the supplier as a facilitator and do not invite the supplier to co-create.</p> <p>Proposition 10c2: Reactive municipalities have sole control over the value creation process and the supplier has no influence on the value-in-use arising from the customer usage process.</p> <p>Proposition 10c3: A value proposition emphasizing product and service quality tends to be more appealing to reactive municipalities and positively influences value-in-use.</p> <p>Proposition 10d1: Proactive municipal cooperations tend to invite other ecosystem players, but not the supplier, to collaborate in the usage process and thereby influence the customer's value creation process.</p> <p>Proposition 10d2: A value proposition emphasizing product quality and superior service in establishing connections with other software systems tends to be more appealing to proactive municipal cooperations and positively influences value-in-use.</p>
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