Master´s thesis

The purchase and implementation of IT solutions in Danish municipalities

Challenges and success factors in the planning and execution of public IT projects

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by

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Abstract

Purchasing and implementing new IT solutions in a municipality is a challenging process. Stories of failed IT projects in municipalities as well as other public organizations are commonly seen. This project researches the factors, which cause IT projects to fail in the purchasing and implementing phases, and how municipalities and IT providers can ensure successful IT solutions. Parasuraman et al.´s (1985) concept of defining quality as a gap between the customer´s expectations and perceptions sets the theoretical groundwork for the project. Additional literature on service quality and implementation models are applied to identify quality factors that can influence the success of IT projects. An explorative design is used in which the project defines hypotheses that are based on the context of the public IT sector and the theoretical background. The empirical case study refers to a document analyses and qualitative research methods in order to test the hypotheses. The data collection is focused on different units of analysis: Interviews with representatives of municipalities, IT providers and SKI are conducted to provide different perspectives and insights on the public IT sector. Based on the data collected in the case studies, the tender and implementation process for IT solutions are analyzed.

The requirement specification in the tender process has been identified as a central factor, which can cause either the failure of IT projects or influence the success. Municipalities and IT providers try to overcome this challenge by different strategies as they:

- improve their internal communication channels and invest resources to formulate a well-researched requirement specification
- avoid to organize their own call for tender and purchase a standardized IT solution – offered via SKI
- use a different type of tender, which gives the option to develop the requirement specification together with the developer.

Factors such as communication effectiveness, relationship management and the use of agile implementation models, which increase the success of IT projects, are often linked to the tender type, chosen by the municipality. The project shows how tender regulation can compromise the success of IT projects and that the resources of the municipality can be crucial for ensuring a successful project.

TABLE OF CONTENTS

1 INTRODUCTION

The Danish government views the digitalization of Denmark's public sector as crucial to save resources and make work processes more efficient. The national digitalization strategies set new IT standards, especially when it comes to IT solutions for the care and education sector (Regeringen et. al. 2011; Regeringen et. al. 2013).

For municipalities, the digitalization strategy of the government is chance and challenge at the same time. On the one hand municipalities have to preserve their service for their citizen and on the other hand also compensate for a lack of resources. New IT projects can save resources and make working processes in the municipality more effective (Hansen 2010). However, purchasing new IT solutions and implementing them in the municipality is challenging. Stories of failed IT projects in both municipalities and other public organizations are common in the Danish media (Hyhne and Skaaning 2014; Elkær 2010; Lundström 2015; Bjerge and Flensburg 2003; Brogaard Jensen 2009).

This raises the questions:

Which factors cause IT projects to fail and how can municipalities and IT providers ensure successful IT solutions?

In this project these questions are analyzed, first by giving an overview of the public IT sector, which was subject to major changes in the recent years. The privatization of KMD and the development of a common IT architecture to ensure equal opportunities to IT providers were part of governmental strategies to increase competition on the market. The law on tender (in Danish: udbudsretten), which regulates the purchase of IT solutions, is another instrument to ensure competition on the market and also help municipalities in finding the most efficient IT solution.

The project will analyze the public IT sector and how current trends such as a higher competition, law on tender regulations and standardization influence the purchase and implementation of IT solutions in municipalities. In order to identify success factors in IT solutions, the thesis refers to the theory on service quality. Parasuraman et al. (1985) define service quality as a gap between consumer´s expectations and perceptions. This definition is used as the basic concept behind the success of IT projects and it will serve as the basis for the main hypothesis of this project. The main hypothesis is:

I.) The more the IT provider is able to meet the municipalities´ expectations with their IT solution, the more likely the IT project will become a success.

This hypothesis is based on three sub-hypotheses, which are central propositions that structure and guide the project. These propositions support the main hypothesis and are based on the context analysis and theoretical background in ch. 2 and 3. The sub-hypotheses build on the information given in the ch. 2 and 3 and are then further analyzed and discussed in ch. 5 and 6. The first sub-hypothesis narrows the field for the analysis and the factors which may impact the success of the IT solution.

1.) The call for tender and the implementation of the IT solution are central processes, which decide if the IT project will be seen as successful.

The call for tender decides which IT solution will be chosen and which functions it should fulfill, while the implementation process has to adapt the IT solution to the municipalities and ensure the correct use.

2.) The paradigm of co-production is essential for the tender and the implementation process. It is presumed that both provider and municipality have interest in a successful project.

This sub-hypothesis is based on the theory of service provision, especially on the concept of co-production, which views that provider and customer have to work together for achieving good quality. The efforts of the customer are an essential part for achieving a good service quality. This supports the main hypothesis: The IT provider has to have sincere intention of meeting the municipality's expectations, while the municipality has to support the IT provider in the tender and implementation process. This leads to the third sub-hypothesis with concretizes the second sub-hypothesis and links the tender regulations to the concept of Parasuraman et al.´s (1985) service gap.

3.) When making a call for tender, the municipalities' expectations for the IT solution are reflected in the requirement specification, which is the basis for the IT provider to develop its IT solution.

In the project the requirement specification made in the call for tender is seen as a reflection of the municipality´s expectations for the IT solution. Instead of analyzing if the IT provider meets the expectations of leaders, IT experts and future users in municipalities, the requirement specification is seen as a filter for these expectations. It is assumed, that the requirement specification results of the matching of expectations between the relevant stakeholders. The service gap is greater, the more the IT provider is not able to meet the requirements stated by the municpality.

In order to investigate if the hypotheses can be confirmed or rejected, this project is based on a qualitative analysis. The units of analysis are municipalities and IT providers. Representatives of five municipalities and two IT providers were interviewed to collect data about:

- the public IT sector
- the relationship between providers and municipalities
- the process of purchasing and implementing IT solutions in municipalities

In this project, contextual factors (such as challenges created through tender regulations or competition) and internal factors (such as the municipalities and the IT provider´s strategies to ensure a successful project) are analyzed. The focus of the project´s analysis is on IT solutions for the elderly care in municipalities. Focusing on a single type of IT solution gives better conditions for comparisons between the data, collected in the interview with the representatives from the municipalities and the providers.

Chapter 2 gives an overview about the recent developments in the public IT sector and explains the regulations of tender process, which is relevant for the understanding and analysis of the research context. The ch. includes description of the dismantling of KMD, the introduction of a common IT framework for municipalities, the law on tender and its development as well as central actors like SKI[1].

Chapter 3 describes the theoretical background of the thesis. While ch. 2 has built the framework for the context of the analysis, ch. 3 relates to theories and concepts of the service quality literature, which are suited to identify factors that influence the success of IT projects. Ch. 3 explains the concept of the service gap and relates it to the use of IT solutions. In addition, factors such as relationship management and communication effectiveness, which can close the service gap are operationalized. Ch. 3 also relates to research regarding the use of contracts in public tenders to secure quality standards and factors for a smooth implementation process.

Chapter 4 explains the method of the project. The ch. presents the empirical approach of this project. It describes the document analysis and how the cases for the interviews were chosen.

Chapter 5 uses the factual context (ch. 2) and the theoretical background (ch. 3) to analyze the tender and implementation processes and identify factors, which influence the service

[1] Statens og Kommunernes Indkøbs Service

gap and thereby the outcome of IT project. The analysis is based on the data collected from official documents and the conducted interviews.

Chapter 6 discusses the sub-hypotheses made in the project with the information gained from the analysis (ch. 5). In addition, tension fields, which have been identified in the analysis *Standardization vs. Customization; Standardization as a barrier for Competition and Innovation* are further discussed.

Chapter 7 is the conclusion, which answers the research question and explains the central factors that influence the success of the IT projects in municipalities

2 DEVELOPMENT, REGULATIONS AND KEY ORGANIZATIONS OF THE DANISH PUBLIC IT SECTOR

This ch. gives an introduction into the public IT sector. Actual developments, key-actors and law regulations are described. The aim of the ch. is to provide an overview to the project's context and explain the complexity of the sector. Thereby challenges for both IT provider and the municipalities are identified. The insights about the project´s context create the basis for choosing the theoretical framework in ch. 3. The information in this ch. can thereby be used to adapt theories to the projects context and to set certain theoretical assumption into perspective.

The ch. also provides the background for first sub-hypothesis:

I.) The call for tender and the implementation of the IT solution are central processes, which decide if the project will be seen as successful.

The call for tender is a central step in purchasing a new IT solution. It impacts the outcome of IT projects and sets the service level for the implementation process and the support services at an early stage.

In section 2.1 the privatization of KMD as well as the introduction of the common IT-architecture is outlined. These two factors build the groundwork for ensuring the dismantling of KMD´s previous monopoly and more competition on the IT market. The governmental strategies indicate the focus on increasing competition. With this strategy the government aims to further cheaper and more innovative solutions for the public sector. These developments have changed the conditions for IT projects and the strategies of both IT provider and municipalities.

Section 2.2 explains the regulations of the tender process. The process is described in detail giving insights into the municipality's responsibility to specify the requirements for the IT solution and the juridical constraints of the tender process. The s. also gives information on different tender types.

Section 2.3 describes the SKI, which is a public organization that is specialized in preparing and executing public tenders on behalf of other public organizations, such as municipalities. These tenders

are called SKI agreements, which municipalities can choose instead of making their own call for tender. The s. also describes the use and development of standard contracts in the public IT sector. SKI agreements and the development of standard contracts indicate a stronger standardization in the sector, which aims at increasing the chances of successful IT projects.

Clarification of terms

IT provider – is a private supplier/company, which provides and sales their IT solutions to public organization such as municipalities.

IT solutions – are defined as a mix of products and services. They include software and/or hardware, which are delivered by the IT provider and also IT services such as IT consulting and IT support services.

Contractor – Is the organization, which has made the call for tender. Contractor is a more general term used for tenders, which include municipalities or other public organizations such as SKI.

Centers – Danish municipalities can often be divided into centers. Every center has a certain subject area – such as childcare, care for the elderly or handicapped, education etc. The structure and how the centers are composed differ from municipality to municipality.

Superuser (dan. superbruger) – is a group of employees, which serve as a link between IT experts and users of the IT solution. Superuser have a local support function and they help the users in connection with the correct use of the IT solution.

IT project – describes the purchase/tender and implementation of an IT solution in the municipality.

2.1 THE PRIVATIZATION OF KMD AND THE INTRODUCTION OF A COMMON IT ARCHITECTURE

The public IT provider KMD was sold by Local Government Denmark (Danish: KL) in 2009. The intention of privatizing KMD was to increase the competition on the market regarding IT administration systems in municipalities. For 30 years KMD has been the primary IT provider for Danish municipalities. The company has developed most their IT systems and helped in building the IT-system architecture in the municipalities.

IT systems were often developed for a certain subject area like elderly care or school management. This meant that each center in a municipality had their own administrative system. There was no

broader scope and no links to other IT systems in the municipality, which enforced *silo-thinking* in the public sector (Sorø and Ringsted Kommune 2013:4-5).

The future systems in municipalities aim at breaking down the barriers between the different administrative systems in the municipality and enable better communication across different centers. This should provide a better coordination in or between the different centers in the municipalities, but also with other public organizations, such as hospitals etc. (Dragsted et al. 2008: 91). Following the privatization of KMD, KOMBIT was founded as a public organization to support Danish municipalities with IT- and digitalization projects. KOMBIT ´s task is to represent the Danish Municipalities interest in the IT sector. It aims at ensuring ownership on central IT support systems in municipalities, which earlier were offered by KMD and secured the company's advantage in the sector. KOMBITS efforts to improve transparency and competition on the market, give more IT providers the possibility to participate in public tenders (KL and KOMBIT 2012).

One of KOMBITS projects is the development of the common *framework architecture*. This included that the central support systems used in municipalities were developed from scratch. These support systems form the foundations of the *framework-architecture* and replace KMD´s older IT solutions. Characteristics of the *framework-architecture* as are open interfaces and clear standards, which should ensure compatibility, transparency and flexibility of new IT systems (KL and KOMBIT 2012: 4-5). Municipalities gain a tool for formulating technical standards when preparing a call for tender. Access to these standards make it also easier for IT provider to develop solutions, which are compatible in all municipalities (Sorø and Ringsted Kommune 2013:5-11; KL and KOMBIT 2012: 2-3).

2.2 PUBLIC PROCUREMENT AND THE TENDER REGULATIONS

When municipalities purchase new IT systems, they have to prepare an invitation to tender. There are three general principles in the EU law on public procurement which the public contractor must adhere to: the principles of *equality of treatment*, *transparency* and *proportionality* (Dragsted et al. 2008: 549; KFST 2016: 16-17).

The most important principle of public procurement is the *equality of treatment*, which has its origin in establishing a free and equal competition in the European market. According to this principle, the public contractor is obligated to ensure that the same rules apply to all providers and that they are treated equally. However, the equality of treatment principle can prove problematic, when it comes to questions of consultancy and technical dialogue before the tender is conducted. If a public entity decides to get technical assistance from an IT provider when specifying the requirements for the next tender, it has to be ensured that all tenderer have access to the information. In accordance to the

equality of treatment principle negotiations between the contractor and a tenderer are prohibited in the procurement rules (KFST 2016: 13-17; Dragsted et al. 2008: 549-555).

The second principle of the EU law on public procurement, the *principle of transparency*, should secure the adherence to the equality of treatment principle. The principle obligates the contractor to provide transparency in the tenders´ assessment criteria and the negotiation process. It should prevent the public contractor from purchasing from a preferred provider and enable the tenderer to assess the contractors' adherence to the principle of equal treatment (Dragsted et al. 2008: 549-555; KFST 2016: 19).

The last EU principle is the *principle of proportionality*. The public contractor is obligated to specify requirements for the tender, which correspondent to the purchase of the IT service. This principle should ensure that no requirements made by the contractor artificially limit the competition for the tender (KFST 2016: 18).

The EU public procurement directive regulates the public purchases which exceed a certain contract value, which is called threshold value. The EU directive on public procurement does not regulate purchases for municipalities below the threshold value of 1,5 million. These are covered by the Danish law, which follows the same principles. The Danish law on tenders requires public authorities to advertise the purchase of goods/services, if there is a clear cross border interest and if the value exceeds the threshold value of 500.000 DKK. A clear cross border interest exists, when the contractor estimates that a company in another EU-country would be interested in participating in the tender (KFST 2016: 29-30; Dragsted et al. 2008: 556).

The purchase of IT solutions often exceeds this threshold value and a cross-border interest is given, which obligate municipalities to advertise their call for tender and follow the rules set by the Danish law (Dragsted et al. 2008: 560).

The duration of a contract for IT solutions that result from a tender is between 3-5 years. However, there is no formal regulation on the duration of a contract. The duration can be more than 5 years, if there is a reason for it (Dragsted et al. 2008: 561).

2.2.1 REQUIREMENT SPECIFICATIONS

The tender process formally begins when the contractor publishes the notice of invitation to tender, so that all potential tenderer have access to the information. This notice also sets the framework for the tender, which determines the form, scope, terms and conditions as well as the award criterion of the tender.

The content of the tender´s notice of invitation limits the following process as the contractor is not allowed to make changes to the published information because this may impact the equality of treatment. Therefore, the contractor has an interest to publish a notice of invitation with an accurate description of the task. This should secure the best possible competition without compromising the contractor's interests. In addition, the contractor has to publish the "tender documents", which specify the contractor´s requirements for incoming offers. The notice of invitation and the tender documents provide the basis on which the tenderer make their offers. When the public contract specifies the requirements for the tender, the contractor has to adhere to national standards as well as ensuring an equal basis for all tenderer (Dragsted et al. 2008: 579-580). Experiences from tender processes show that contractors are challenged when specifying the requirements for the tender. The requirement specifications have to be defined with care, as they impact success of tender process as well as the content of the contract. Lauesen (2016:6) has identified four major requirement dangers:

1. *The right requirement level*. The requirements may describe the system with so many details that only a single provider can meet them. On the other hand, they can also be so business goal-focused that no provider will want to take responsibility for them. When the contractor expects to achieve a certain increase in efficiency through the implementation of a new system, it is often so that the s provider cannot meet the requirement without the contractors help.
2. *Requirement accuracy*. Requirements are not accurate enough to get verified. Either it is difficult to measure if the requirements are met or they may only be verified when the system has been used for some time, thus making a comparison between the provider's proposals impossible.
3. *Requirement scope*. The requirements do not cover all the important demands, for example, user needs or business goals are not covered. The requirement should list the user tasks, which have to be supported by the system. Business goals are often defined without making a plan on how the system should contribute with. Hence, business goals have to be traced to the requirements.
4. *Implementation risks*. Major risks appear too late in the process. Often the functionality is delivered early. However problems appear with the integrating the whole system at a later stage. Therefore, it is important to demand an early proof of concept from the supporters to minimize risks at a later stage in the implementation (Lauesen 2016:6-8)

Lauesen´s (2016) input on the requirement specification is used to specify the interview questions in the case studies and to verify the challenges linked to the requirement specification.

2.2.2 REGULATION OF RESERVATIONS

When public contractors put the acquisition of a new IT system out for tender, IT providers can use the instrument of reservations on certain requirements. IT acquisitions can include several unknown factors and the descriptions of the service, which have to be supported by a new IT solution, may be too vague for making a proposal. Using *reservations* give provider the possibility to make the contractor aware of misunderstandings or unrealistic requirements. However, provider risk that their proposal is not considered when they enter their r*eservations* to a certain requirement. Therefore, the contractor has to point out which requirements have to be seen as minimum requirements, while also allowing the instrument of giving reservations to other requirements (Dragsted et al. 2008: 585-586).

2.2.3 DIFFERENT TYPES OF TENDER

The public procurement rules cause certain challenges for the IT sector, because it is difficult to specify the requirements for an IT system, when it is put out to tender.
Therefore, there is a need for dialogue between the public contractor and the provider in order to find an optimized solution, which corresponds to the contractors´ budget and time frame. However, public procurement rules prohibit dialogue with a single provider before the tender process is concluded. Other tender types, such as the *competitive dialogue* give better options for a dialogue between the two parties (Dragsted et al. 2008: 547-548).

When it comes to purchase of IT solutions, the following three tender types are the most common (Digist 2013: 11).

1. standard tender
2. restricted invitation to tender
3. competitive dialogue

In this project the focus will be on the standard tender and the competitive tender, as these types were applied in the cases of the empirical study (KFST 2016: 50-51).

2.2.3.1 Standard Tender

In a public tender all relevant companies can make an offer. Consequently, this type of tender offers the biggest competition, when it comes to the purchase of a new product. However, the amount of tenderer leads to an increased use of resources, because the contractor has to evaluate every proposal. This kind of tender is therefore used for smaller markets like the IT market, because the number of competitors is limited.

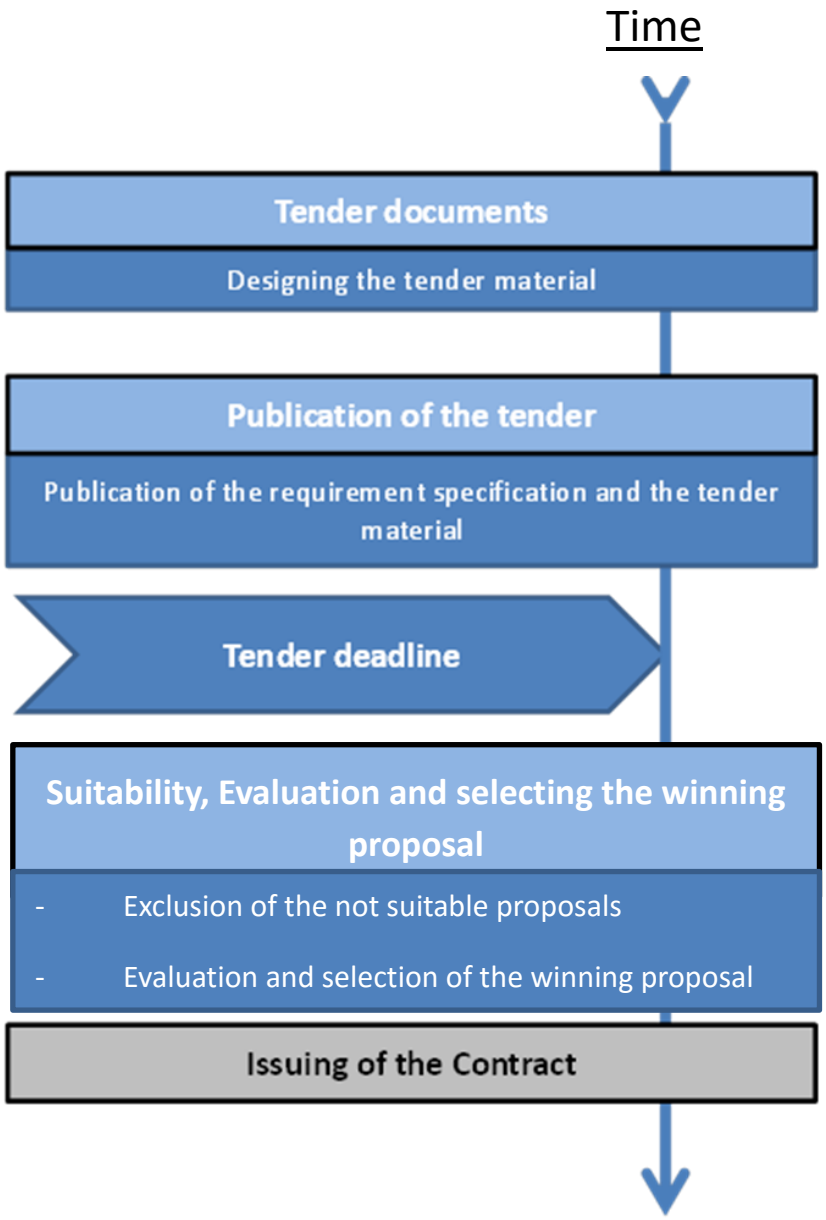

Figure 1 Process of the standard tender (KFST 2016)

Before the different offers can be compared with each other, the public contractor has to make an assessment of the providers' technical, economic and financial qualifications. The assessment is based on the information the providers sent together with their proposal. Only the proposals of those

providers, who meet the contractor's requirements, are considered. An important criterion for this type of tender is that the contractor presents a clear outline of the solution, which is to be purchased. The contractor should be able to define the requirement specifications as the tender-type offers only limited flexibility after the proposals have been given (KFST 2016: 49-51; Dragsted et al. 2008: 56).

2.2.3.2 Competitive dialogue

The competitive dialogue is more flexible tender type, which gives contractor and providers more options to a have dialogue about the needs and expectations of the contractor and about the concrete tasks, which have to be supported by the IT solution. This exchange of information happens in the so called dialogue-phases, which structure this tender type as described below.

Contractors can use this tender-type, when they are not able to fully define their requirements. The dialogue with the providers is thereby a way to define and identify these requirements, before they are determined in the tender announcement. The aim of the competitive dialogue is to improve the quality of the provider´s proposals in order to make a purchase, which is tailored to the contractor´s needs. The conditions for applying this tender type are:

- Need for adaption of available solutions on the market
- High complexity of the acquisition
- Innovative solutions
- Technical specifications cannot be defined accordingly

This type of tender only can be used when no available standard solution is able to meet the contractor's needs.

The competitive dialogue starts with an application phase, where interested providers can participate. The contractor gives a more detailed description of the task with the announcement of the tender, which should be supported by the tenderers given solution. The contractor can also give a need assessment. Out of the applications, the contractor chooses 3-5 providers, which are invited to send in their proposals, where they describe their solution. These solutions are the basis for the following dialogue, where the technical possibilities and the financial and juridical aspects are discussed. As with every tender type, the contractor has to define the evaluation criteria for the final phase in the announcement. However, the final requirement specification will not be determined until after the dialogue with the chosen providers. Only the minimum requirements have to be defined in the tender announcement.

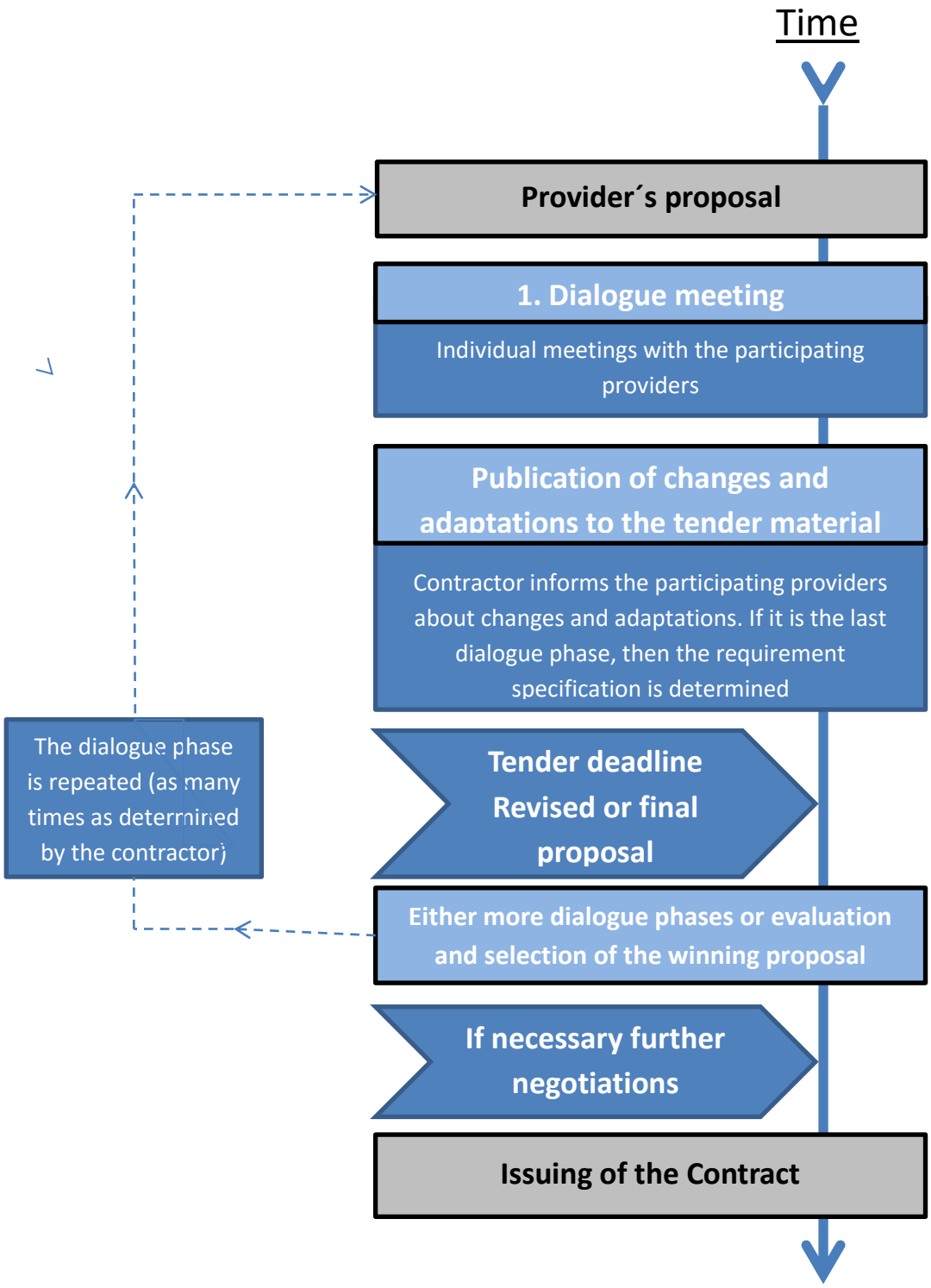

Figure 2: Dialogue phases (KFST 2016)

In the dialogue phase the contractor has to have individual meetings with every chosen supporter. The evaluation criteria, general elements of the tender and the minimum requirements are excluded from the dialogue with the providers. In the competitive dialogue the final proposal of the tenderer still can be part of the negotiations, which offers also further flexibility in later stages of the IT project.

The dialogue phase may consist of a certain amount of dialogue meetings, in which it is discussed if the solution satisfies the contractor's specific needs. The contractor is obligated to describe the dialogue process, so the provider can plan and structure the phase best possible. This is to ensure transparency and that no provider is favored in the process. On the basis of the dialogue meetings the contractor can adjust the requirements and need analysis, which were made in the tender announcement. The dialogue phase continues, until the contractor has found a solution, which best suits its needs (KFST 2016: 67-76).

2.2.4 THE AWARD CRITERION

With the new law on tender, which was introduced on 1 January 2016, the award criteria have to be made transparent for the tender. This provides providers with better possibilities to optimize their proposals and reduces the likeliness of juridical disputes about the award criteria. Furthermore, it gives better overview for the contractor to compare price and quality. Consequently, it is also important for the contractor to clearly state, which requirements in the tender material that are described as minimum requirements. If providers are not able to fulfill the minimum requirement, they are often not eligible for a further evaluation (KFST 2016: 211f). The contractor can choose between the award criteria *lowest price* or *most economically advantageous tender*. The last criterion is mostly applied, when acquiring new IT solutions. When applying the criterion *most economically advantageous tender*, the contractor has to specify additional sub-criteria, which have to make the assessment process of identifying the most economically advantageous offer more transparent. It is important that these additional evaluations criteria have to be measureable and relevant for the acquisition of the new IT solution. The contractors are also obligated to clearly state, how the additional criterions are weighted (Dragsted et al. 2008: 581).

Examples on three evaluation models used in identifying the m*ost economically advantageous* proposal in the tender are:

1. The *price model* assigns a specific price to a certain quality level. High quality gives a low price in the evaluation process. The prices – which result from the quality evaluation – are then added to the price of the IT system and result in a total evaluation price. The offer with the lowest evaluation price wins the tender.

2. The *point model*. Here quality level and prices are converted to points. The proposal with the highest score wins the tender.

3. The *prose models* describe the balance between price and quality of each proposal. Evaluations are given through reports and explanations (KFST 2016: 8).

The public contractor has to make clear in the tender material, which evaluation model is used in the tender.

2.2.5 SIGNING OF THE CONTRACT

The tender process does not end with the contractor's choosing the provider and the signing of the contract. The rule of *standstill* involves that the contractor is not allowed to sign the contract with the provider until 10 days after all participants have been informed about the result of the tender. This gives other providers the possibilities to send their complaints to the complaints board, which will then investigate if there has been a violation of the tender directives.

In this period the contractor and the chosen provider usually clarify matters regarding the provider's proposal and the contractor´s requirements. This phase is still subject to the public procurement rules and its principles, but give both parties better options to exchange information. However, the basis conditions for the tender – the information stated in the notice of invitation and in the tender documents – cannot be subject to changes. Although the relationship between contractor and provider changes after the signing of the contract from being covered by public procurement rules to being covered by the contracts regulation, the public procurement rules and its principles still set the framework for the contract (Dragsted et al. 2008: 585;590).

2.3 NEW FORMS OF STANDARDIZATION IN THE PUBLIC IT SECTOR

2.3.1 SKI

Besides KOMBIT, SKI is another public organization which supports Danish municipalities. SKI was established in 1994 and is owned by the Danish state and KL. The organization aims to centralize the public sector´s procurement, so larger saving and better contract terms for organizations in the public sector are obtained. SKI tender processes result in framework agreement, which specify the services and goods that are offered and the conditions and prices for them. These framework agreements can be about goods like furniture, hardware, or software as well as complex technology services, where the procurement process can be standardized.

Municipalities and other public organization can use these framework agreements from SKI to order goods or services, while being certain that the requirements stipulated by the EU directives have been met. As a result, public organizations do not have to invest resources in carrying out a tender themselves (SKI 2016). An IT provider can become part of a SKI agreement, when SKI sends a framework agreement to EU tenders. Through SKI´s tender-system ETHICS, IT providers can get access to the documents necessary for sending an offer. The documents contain information about

which services the tender covers as well as the decision criteria on which the proposals are rated. The number of IT provider, which can become SKI providers depends on the tender. The framework contract is usually between 2 and 4 years (SKI 2016a).

2.3.2 THE USE OF STANDARD CONTRACTS

An important part in securing a better IT service for the municipalities is better contract management. When making a call for tender or deciding to use a SKI agreement, municipalities tend to use a standard contract. These standard contracts are developed by the Danish Agency for Digitalization (Digist). The agency supports municipalities with competence development about tendering rules and knowledge about the market. The standard contract has been developed after input from provider and public organizations (Sorø and Ringsted Kommune 2013:13-14).

The contract includes details on the implementation, support services and regular updates. Three standard contracts for IT projects exist, the K01, K02 and K03. The most widespread are the K01 and the K02. The K01 is used for short implementation projects, while the K02 is applied for more complex IT projects. There are only small differences in the content of the two contracts. Both contracts use the information of the tender to determine the requirements for price, delivery time and service. This also defines the *baseline of the agreement*. The newest standard contract form K03 aims at more flexibility and can be used for IT projects with a high degree of consultancy services or agile project management (Dragsted et al. 2008: 65-67).

3 THEORETICAL BASE

The project´s main hypothesis is based on the theories on service quality, especially on the concept of the service gap. This ch. will describe the theoretical background of the study and relate it to the public IT sector. The context information of ch. 2, such as the dismantling of KMD´s monopoly, the rules on tender, the use of SKI agreements and standard contracts provide a framework for concretizing the concepts on service quality to the project´s field of research.

In s. 3.1, the theoretical concept of the service gap is explained in detail. The origin and it´s development to specific service sectors is described. In order to further relate the concept of the service gap to the field of research – IT solutions – the ch. draws on additional models. The models of Grönroos (1983) and Gummesson and Grönroos (1989) are applied to operationalize quality factors of IT solutions. These models aim at a product/service mix and are therefore well suited for the analysis of IT solutions.

In s. 3.1 the theoretical context is for main hypothesis is built. ***The more the IT provider is able to meet the municipalities´ expectations with their IT solution, the more likely the IT project will become a success.***

In combination with the information of the s. 3.1, ss. 3.2 and 3.3 also provide the theoretical background for the sub-hypotheses two and three:

2.) The paradigm of co-production is essential for the tender and the implementation process. The project presumes that both provider and municipality have interest in a successful project.

The paradigm of co-production is a central part in the service provision. Especially knowledge intensive services, which are parts of IT solutions, are dependent on the co-production of the customer – this applies when it comes to coordinating the tender process as described in s. 2.2 and also when it comes to the implementation as described in s. 3.6. The reciprocal interdependence of service provision is evident in the IT projects, as the municipality shape the success of the IT project already with the definition of the requirement specification, which leads to the third hypothesis:

3.) When making a call for tender, municipalities have to define their expectations and needs in a requirement specification, which is the basis for the IT provider´s development of the IT solution.

This project works on the basis that the expectations of the customer are defined in the tender documents, specifically in the requirement specification. The provider builds its proposal for the tender on this information. When it comes to analyzing the service gap, the third sub-hypothesis is used as an indicator to measure a successful IT project, by comparing the expectations (the requirement specification) to the perceived quality of the IT solution.

Section 3.2 relates to the study of tender contracts to give a better understanding on how the tender rules can secure quality standards in the IT project. The study emphasizes the fact, that in tenders quality criteria are stipulated in advance.

Section 3.3 describes the importance of communication when trying to bridge the service gap. This s. indicates the central challenge of the tender rules, because they limit the communication between both provider and municipality. In 3.3, theoretical correlations between communication effectiveness, service quality and relationship quality are made.

Section 3.4 relates to the importance of customer and technical knowledge and how it can minimize the service gap. Both knowledge categories are important for the public IT sector. IT providers have to have technical understanding of the tender rules and customer-knowledge. This enhances the ability to create a IT solution which meets the customer´s expectations.

Section 3.5 explains two models used in the development and implementation of IT solutions – the waterfall and the agile model. The s. explains the different characteristics and how they may influence the success of the IT project.

Section 3.6 refers to the ISF framework, which is used as a model to analyze implementation process. It describes the different responsibilities and how provider and customer best can complement each other.

3.1 The theoretical Concept of Service Quality

For Parasuraman et al. (1985) service quality results from a comparison of service expectations with service performance. A poor or low quality service is one that does not meet the expectations and requirements of the customer (Edvardsson et al. 1994: 75).

Parasuraman et al. (1985:42-43) conceptualize service quality as a gap between consumer´s expectations and perceptions. Their concept is based on an evaluation process where the customers compare their expectations with the service they have perceived.

In later research, Parasuraman et al. (1988) created the SERVQUAL instrument, which is based on five dimensions and several indicators to evaluate and measure the perceived quality. These 5 dimensions are:

1. Tangibles – the appearance of physical facilities, equipment, personnel, and communication materials
2. Reliability - the ability to perform the promised service dependably and accurately
3. Responsiveness – the willingness to help customers and to provide prompt service
4. Assurance - the knowledge and courtesy of employees and their ability to convey trust and confidence
5. Empathy - the provision of caring individualized attention to customers (Parasuraman et al. (1988: 6).

Different indicators for the dimension were created to measure the expectations and perception of services. First, the SERVQUAL intends to collect data on the general expectations the customer has to service companies in general. Secondly, the data on the customer´s perceptions about the particular company is collected. The difference between the expectation rating and the perception rating represents a measure of perceived service quality (Yoon and Suh 2004 343).
The early SERVQUAL instrument and its service quality parameters generalize the different service industries. Chowdhary and Prakash (2007:495) criticize this generalization, because there is a high variation in the basic nature of services and the type of industry affects the design of service. In some sectors empathy and responsiveness were found to be more important while tangibles and reliability has bigger value in case of capital intensive services like the IT-solutions investigated in this project.

Due to this generalization, SERVQUAL models for different service industries have been developed. Yoon and Suh (2004:343) have refined Parasuraman et al.´s (1988) model for IT consulting services. They have added *process* and *education* as new measurement dimensions, while not referring to tangibles in their SERVQUAL adaption.

- Indicators for *education* are among others – Introduction training and development programs to customers, educate the customer´s staff etc.
- Indicators for *process* are among others– Constitute the project team well organized with clear role assignments; establish the specific project schedule etc.

The dimensions added by Yoon and Suh (2004:347) are also relevant when analyzing IT solutions, because IT consulting services are central part of them. In this project IT solutions are defined as a mix of products and services. They include software and/or hardware, which are delivered by the IT

provider and also IT services such as the described IT consulting and IT support services, which help to keep the software up to date and to fix errors.

Grönroos´ (1984:36-40) concept of evaluating service quality is based on the customer's perception of technical quality and functional quality. The *technical quality* describes what is provided (i.e. information quality, system quality) and the *functional quality* refers to how the service is provided (i.e. courtesy, attention, professionalism etc.).

The differentiation in two quality categories helps to better analyze the quality of mixed services such as IT solutions. In reference to IT solutions *technical quality* relates to the products such as the software included in the IT solution or the hardware. Yet, it also relates to the output of IT services, such as the training quality of the customer´s employees or the information quality of support services etc.

Functional quality is based on the attitudes and behaviors of the provider´s staff. For IT solutions this can include access times of support services, the communication quality between provider and customer or the responsiveness of the provider´s employees etc. The functional service quality is more process-related and focuses on how the customer receives the service. While often no measurement standards exist, it still is crucial for the customer's perception of service quality in general (Edvardsson 2014: 88-89).

In Grönroos´ (1984) concept on service quality, both technical and functional qualities are filtered through the customer´s image of the company, thus, forming a full assessment of service quality. Grönroos´concept has strong links to Parasuraman et al. (1985) definition of service quality. Service quality is also assessed by Grönroos by comparing the *perceived* quality with the *expected* quality.

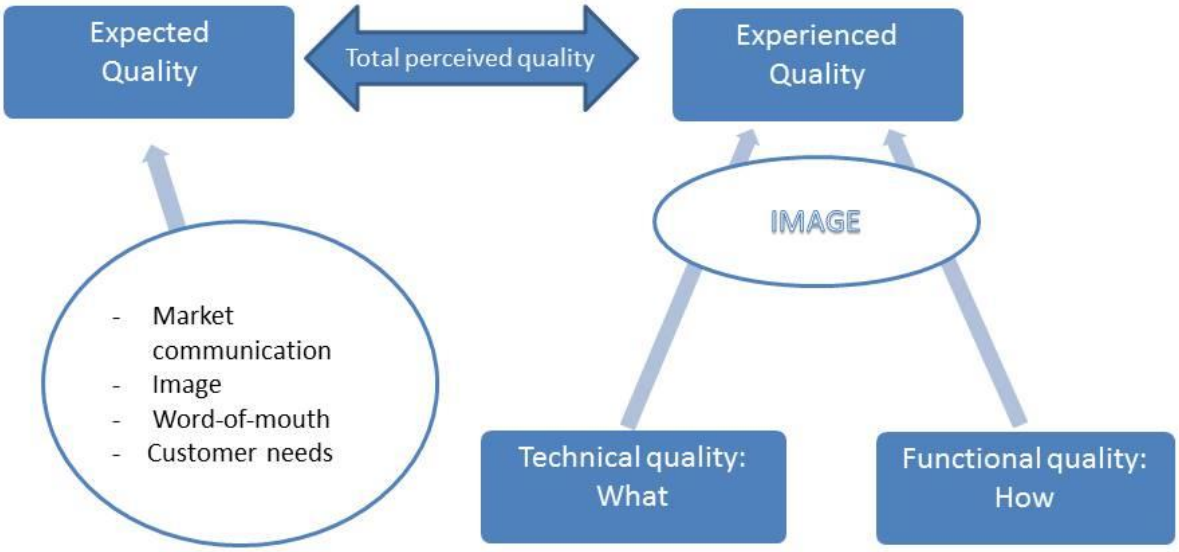

Figure 2: Customer-percevied Quality – (Grönroos 1990)

The Image the customer has of the provider has either a positive or negative effect on the perceived quality (Edvardsson et al. 1994: 90). A further extension of the model is later made by Gummesson and Grönroos (1987). This model aims at creating a framework, which encompasses the service and the product quality. Here Grönroos' (1984) model is combined with the 4Q model made by Gummesson (1987). Gummesson's 4Qs model stemmed from the manufacturing sector and aims at high-technology products, which depend on additional services for installation, training and after-service. Hence it is also applicable for IT-solutions. The 4Q model stands for:

- *Design quality* – relates to the efforts of the provider to design the product ("from the start"), so it meets the demands of the customer
- *Production quality* - relates to manufacturing and can simple be described as the quality of the product
- *Delivery quality* –refers to support services of the provider for implementing the product at the customer
- *Relational quality* - refers to the relations between customer and provider and how they can affect the perception of the overall quality

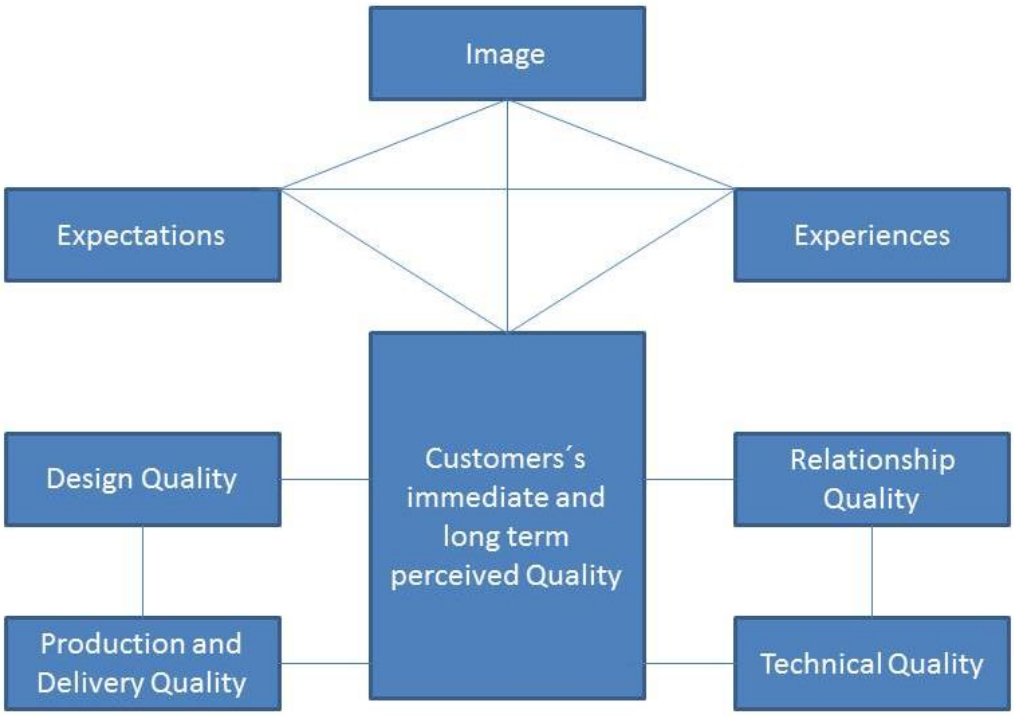

Figure 3: 4 Q-model – (Gummesson 1987)

These four factors are part of the customer's quality expectations and will be evaluated when they are compared with the perceived quality of the product/service. The model is a useful extension for assessing quality in IT solutions and is applied in the analysis of this project (Edvardsson et al. 1994: 90-92).

Yoon and Suh´s (2004) extension of the SERVQUAL and Gummesson and Grönroos (1989) show the importance of adapting the theories of service quality to specific industries. Their contribution to a changed operationalization process shows that measurement parameters have to be adapted, when assessing the perception of services by customers. Using a standard SERVQUAL will not take regard to all attributes that characterize certain services and as a result it will give an incomplete assessment of service quality. Additional parameters which are crucial for the service provision in certain sectors have to be identified. In Yoon and Suh´s model it is education and process for IT consultation services. However, for IT a solution, which includes several services and also products, even more factors have to be considered.

Researchers have used the SERVQUAL instrument in evaluating and measuring service quality in different business areas. Some have been critical of its paradigmatic foundation, the use of different scores and discriminant validity. (Chowdhary and Prakash 2007: 494). Others have criticized SERVQUAL´s core assumption of assessing service quality through a gap score (Yoon and Suh 2004

343). These are also part of the reasons why the project will not apply the SERVQUAL model to assess the provider´s score on service quality based on expectations and perception. There are both practical and theoretical reasons to why a gap score will not be calculated on the cases in the project instead the project focuses on the concept of a service gap.

- The first reason is the difficulty of applying a survey which in the first stage collects information on the expectations and in a second stage on the perception on the service. Contract lengths of four years and the length of the process between choosing a provider and experiences the services make it difficult to find suitable municipalities for this empiric design.
- The second reason is the difficulty to give a more holistic picture of the service quality. Employees at different levels have different preferences for the IT services and thus may have different perception on the provider's service quality (Edvardsson 1994: 77;78).
  The survey would have to be adapted to each of the employee groups:
  - The director of the center
  - The IT department
  - The users and super-users of the IT solution

  Using different surveys in several municipalities would exceed the projects limits.
- The third reason is the research design decision for this project. The explorative character aims at identifying strategies that can reduce the service gap. Due to the rules on tender, expectations of the municipalities are embedded in the requirement specifications as well as further discussed in the contract. Thus, a survey asking for perception of IT service would be insufficient as the answers rarely take the restrictions of the juridical framework into regard. It would be unclear whether IT provider could be held responsible for the success of the IT project or whether the mistake lies in the execution of the tender process. Thereby the project´s focus is explorative with aim to identify the factors which affect the service gap.

3.2 The value of Contracts in public Tenders

Research in the in service quality has mainly focused on customers' perceived quality , where Service quality and the measurements of it has been the main focus (Grönroos, 1983; Parasuraman et al. 1985; Parasuraman et al. 1988; Zeithaml et al. 1990; Perez et al. 2007). Only few publications have investigated the evaluation of service quality in connection with public procurement. Carmen (2011) has done a study for the public transportation sector and focused on contracts and their function in managing quality services.

Contracts are an important part when analyzing knowledge intensive services or so-called credence and/or contract goods such as IT services. These services are typically subject to special information

and insecurity problems, since provider and contractor assess and agree on services that are not yet provided and that often remain unclear due to the complex and structured problems in connection with their provision. The complex character of the expected service also implies that the information and insecurity problems are particularly relevant. They can be divided into:

1. The potential contractor is insecure when it comes to the performance of the service provider. The danger lies in the suboptimal selection of a service provider may not be able to provide the desired quality.
2. The potential contactor is faced with insecurity if the service provider has sufficient commitment. After the conclusion of the contract, the service provider may advantages of dependencies already developed. Such dependencies can be high switching costs that can be caused by already made investments (Kaiser and Ringlstetter 2011: 52-53).

Contrasts rely on three identified means:

1. laws and regulations
2. standards and measurements
3. and economic incentives

These means can help minimizing the insecurities, when applied rightly. Hence, according to Carmen (2010:319) contracts can bind parties together, specify the content of the service provision and define the nature of the agreement as well as its enforcement. In addition, the contract also sets a framework, when exchanging information between the parties.

Contracts are used at the conclusion of a tender. Here the contract ensures that the information given in the requirement-formulation of the municipality as well as the information given in by the provider's proposal, is binding for the future business relationship (s. 2.3.2). Service quality factors in tenders are stipulated in advance, contracts are then used to manage prerequisites for the service-provision. The contract includes requirements for the output (technical quality) and in a lesser degree also the process (functional quality) of the service. Quality factors are described in detail to minimize insecurities.

For contracts with providers in the public transport sector , Carmen2010: 319 identified the following five quality factors, which are defined in a sample contract

- General quality factors
- Service Quality
- Technical-related quality issues
- Safety/security
- Environmental related quality factors

With reference to Yoon and Suh´s model (2004) similar quality factors can be developed for the IT sector in municipalities:

- General quality factors (Overall fit to the customer´s needs)
- Service Quality (referring to IT consulting and IT support services)
- Technical-related quality issues (stability of the IT solution)
- IT security

Carmen (2010) concludes in her analysis that quality factors in contracts can be related to three different management levels, which are labelled by her as the *operational level*, the *strategic level* and the *rhetorical level*. The service quality factors are described and expressed differently on each of these management levels.

- The first management level – the *operational level* - is the resource-based level that focuses on the prerequisites for the service outcome. This level includes the generic descriptive factors of quality found in the research from a service research perspective (Grönroos, 1984; Parasuraman et al., 1988; Schneider and White, 2004). This level defines the service level and the way in which services are performed. The quality factors are usually comprehensive and specified in detail to ensure the service level that both parties have agreed on.
- The second management level – the *strategic level* – focuses on monitoring the operator. This level creates a quality assurance framework. This level shows that the contractor demands some form of quality assurance and improvement model in order to secure the agreed service level. On this level, the contract has a monitoring effect, as it stipulates both the service quality and service being provided, simultaneously with the contracts that are used to monitor the business relationship.
- The third level – the *rhetorical level* - focuses on the mission and vision of the contract. The service quality factors on the rhetorical level can be explained in terms of expressing an aim or desire, which should permeate the entire organization and the services in general (Carmen 2010: 324-328).

To summarize, contracts stipulate quality factors and the responsibilities of providers and contractors in advance. This helps both parties to minimize insecurities and risks. The determination of quality standards in advance leads also to match of expectations between both parties, before the start of the service provision.
In the analysis of this project it is examined how quality standards are defined between municipality

and provider and which quality categories they cover. In addition, it will be investigated which control mechanisms exist to ensure that the quality standards are kept.

3.3 COMMUNICATION EFFECTIVENESS AND RELATION MANAGEMENT

Kaiser and Ringlstetter (2011: 45) name two levers in which service companies can increase the quality perceived by the customer:

- 1. The company can improve the actual service quality by optimizing the service provision and development, however, the customer has to be made aware of the improvements.
- 2. The customer relation can be used to communicate quality and hereby improve the perception of the service and the company.

Both levers require communication between customer and provider. Communication is also the central factor in the study of Lee and Lee (2014). In IT solutions where intangible, knowledge-based services are provided, effective communication plays a crucial role in gaining trust and relationship-commitment from customers. These factors also impact the customer´s perception of the provider's service quality. Lee and Lee (2014: 322) have developed a research model that focuses on the relationship between *communication effectiveness*, *service quality* and *relationship quality*.

Communication effectiveness is an antecedent of perceived *service quality* and extends towards *relationship quality*. Following the theory behind service quality, a high relationship quality means that there exists only a minor service gap. A large service gap, however, can be traced back to a lack of *communication effectiveness*. This model and its logic is applied to analyze the interviews and to investigate the importance of communication for the relationship between municipality and IT provider. *Communication effectiveness* has three underlying dimensions: *Communication frequency*, bi-*directional communication* and *communication quality.*

Communication frequency describes how often customer and provider communicate with each other in a certain time period. It is also an indicator for the availability of the provider in case the customers wish to contact the provider. (Lee and Lee 2014: 322)

Bi-directional communication refers to the degree to which a two-way communication process occurred between IT experts and customers. It allows information to be shared on a mutual give and take basis during problem-solving or decision-making. This can for example be a feedback circle, where the provider solves a problem and gets additional information from the customer to prevent the problem in the future. (Lee and Lee 2014: 322-323;325)

Communication quality is a measure of how reliable, understandable and useful information that has been provided by the IT provider is. Effective communication by the employees of the IT providers impacts the customer´s perceptions of the functional and technical quality of services (Lee and Lee 2014: 326).

More often than in other industries, technology experts provide IT consultation based on domain knowledge, obtained from the customers in the IT sector. IT provider and customer need to work closely together to solve problems. IT service processes require therefore in-depth involvement and close collaboration between IT expert and customer. Following Lee and Lee´s model, *relationship quality* is strongly connected to *communication effectiveness*. Thus the interaction between customer and provider has an impact on customer´s loyalty or repurchase intentions. Relationship quality consists of *trust* and *relational commitment* (Lee and Lee 2014: 321).

Trust can be described as a source of confidence in the honesty and reliability of exchange partners. In the IT service environment it is defined by an increased reciprocity and an interdependent relationship of both parties, mutual trust plays an important role.

Commitment is defined as the desire to maintain a valuable relationship or by the intention to maintain long-term relationships.

Lee and Lee (2014: 324) define *trust* and *commitment* as critical variables of *relationship quality*. Consequently, Lee and Lee (2014)´s *relationship quality* conforms with Gummessons and Grönroos (1987) model and its definition of the quality factor. Kaiser and Ringlstetter (2011) also view the strengthening of the relational competence as having a positive influence on the quality perceived by customers. IT providers work in close cooperation with their customers, when it comes to the development and implementation of a new IT solution. Thereby the information flow of the IT provider to its customer is equally important for the solutions of problems as the information flow in the opposite direction. The provider–customer relationship therefore has a reciprocal interdependence. The customer becomes a *temporal employee*, as he contributes to the service provision process and is co-producing the service either by co-assessing, co-planning or co-providing. In regard to the implementation the IT solution, the customer provides the network, the infrastructure and part of the staff (Evardsson et al. 1994: 13-16; Kaiser and Ringlstetter 2011: 45-46).

Kaiser and Ringlstetter (2011) differ between two interaction characteristics in the relation between service company and customer.

- *Sparring relation* – The company will work closely together with the customer in order to find a solution, which is tailored to the customer´s need and helps to accomplish the customer´s goals. This service provision process is characterized by a reciprocal interaction. Customer and IT-provider can shift in having a leading role in the project process.
- *Jobbing relations* – In this case the customer is responsible for a complex project and uses the service of the service company to outsource and coordinate subtasks in targeted manner. This relationship is often characteristic, if the required knowledge is highly specialized.

Both kind relationships or a mix of these can exists, depending on the interests of the customers, the invested resources and the agreement between the two parties (Kaiser and Ringlstetter 2011: 45-46). In regards to the implementation of IT solutions, the kind of relationship is also dependent on the used tender type. The competitive dialogue will usually be based on a sparring relation, while the use of the standard tender will probably tend more towards jobbing relations.

3.4 Ensuring Quality services through customer and technical knowledge

In the previous s., the importance of communication to match the customer´s expectations is emphasized. The customer´s feedback is an important source for adapting services and for providing a better quality. Therefore, companies have to have a strategy to collect feedback and information about the customer. However, the law on tender gives restrictions regarding the dialogue with the contractor in a tender process. The principles of transparency and equal treatment limit the communication between both parties. Hence, the preparation of the tender-proposals often builds on the provider´s collected customer knowledge.

This underlines the importance for IT providers to be responsive and to constantly collect customer feedback to build or improve their IT solutions. According to Kaiser and Ringlstetter (2011), both the technical and customer-specific knowledge is essential for professional service company. Technical knowledge is defined as the essential basis to develop methods and solve complex problems. For an IT provider, this means not only having expertise in the development of new IT solutions, but also knowledge about tender regulations and how to formulate proposals for the tender process. Technical knowledge is based on generally applicable, scientific knowledge to analyze, assess and tackle complex situations – this technical knowledge can be the use of implementation or project management models.

Customer knowledge can be divided into three dimensions.

- A general comprehension of the respective sector
- Detailed knowledge about the customer
- Personal knowledge on key staff members such as decision makers and information providers at the customer organization (Kaiser and Ringlstetter 2011: 42).

3.5 Implementation Models and Criteria for a smooth Implementation

The implementation process is a central part of IT projects and responsible for their success. It marks the beginning of the service provision and is regulated in the contract between contractor and IT provider. The IT provider´s services and efforts in the implementation process can influence the customer´s perception for the entire IT solution. This is also indicated by the *delivery quality* as part of Gummesson and Grönroos ´s (1987) model.

The implementation of IT solutions is a cooperative process and it is highly regulated in the Danish public sector. There are two models, which are used: The *waterfall model* and the *agile model*. The *waterfall model* is the most widespread and used when standard IT solutions have to be implemented. The *agile model* is applied for innovative IT solutions, which have not been tested yet (Dragsted et al. 2008: 10).

The *waterfall model* is a sequential design process, where the software project is broken up into different phases. The model was developed for the development of large software systems, which had to go through the different phases such - defining the requirements for the IT solution, the matching of expectations, the analysis of the IT environment, the design of the IT solution, the adaptation or development process, the test phase and the final transfer (Dragsted et al. 2008: 70). Each phase in the *waterfall model* has to be completed before the next phase is initiated. This gives contractor and provider a structure for the IT project. The model is best suited for a short implementation period with a known technology and business processes. When implementing newer and less known IT systems or when using more complex business processes, the use of the *waterfall model* becomes risky. Due to the sequential process, an error made in the early may not be discovered until the end of the project, which then requires additional resources to rework the project. In order to ensure a smooth process, the project requires extensive resources for the preparation beginning with ensuring a precise and applicable requirement specification. The sequential character of the model also makes it less flexible. Change to the municipality's requirements or the customer´s proposed solution have to be evaluated, negotiated and documented. This hinders the progress of the project as changes require more

resources, resulting in a less flexible implementation model (Dragsted et al. 2008: 69-70; Cobb 2015: 18-19).

The second model is the *agile or iterative model*[2]. It is mostly used for complex IT projects, where the customers have difficulties defining the requirements specifications for the new IT system. Instead of defining a complete requirement specification, the contractor describes its needs and goals for the project. The final requirement specification is developed along with the possible solutions in small steps. These small steps are called *iterations* that work towards the projects goal. In every step new experiences are made that lead to a better understanding of the IT system. This process provides the contractor with more information on how to formulate a realistic requirement specification, which minimizes the risk of mistakes and also enables the contractor to include current innovations on the market. The contractor is included in the development process and its feedback influences the final IT solution. The agile model is used, when the IT provider implements a prototype-technology, which has not been tested extensively and is developed to match the customer´s needs (Dragsted et al. 2008:67-72).

3.6 CRITERIA FOR A SMOOTH IMPLEMENTATION

The framework for dissemination and implementation (ISF) is used in this project to identify success factors, which are essential to ensure a smooth implementation. The framework can be applied broadly on any implementation of an innovative service or product, such as IT solutions in municipalities. The framework gives certain quality standards for the implementation, which relate to Grönroos' technical and functional quality model. The ISF focuses on the *output* (e.g. essential elements of the innovation which have to be delivered) and the *process* of the implementation (e.g. certain regulations and standards, so the intended outcomes are achieved) (Meyers et al. 2012: 482).

The ISF framework lists success factors on how the implementation process can help providers to meet the customer's expectations. Thereby the ISF is used as an instrument in the analysis to assess the use of the *waterfall model* and the *agile mode*l in the implementation process. Furthermore, the ISF also identifies barriers for the success of implementations. The ISF emphasizes the need for adaptations, so innovations, such as new IT solutions, fit better to the host setting within which they will be implemented. While it is important that core components should not be modified, there is increasing recognition in the implementation literature that non-essential components often need to be adapted to improve the fit of the technology with contextual features (IT maturity, size of the organization, preferences etc.) (Castro et al. 2010; Meyers et al. 2012).

[2] Further referred to as agile model

The ISF emphasizes the importance of communication between provider and customer. Both parties have to collaboratively build the capacity needed to implement the innovation. The ISF identifies three interacting systems with their own function in the implementation process. The first system identified is the *Synthesis and Translation System*. It distills scientific, theoretical, and/or practice-based information about innovations and translates it to user-friendly formats (e.g. manuals, guides, worksheets). Adjusted to the implementation of IT solutions, this system is often a central part of the IT provider's initial tasks before a proposal for a tender is formulated (Meyer et al. 2012:482).

The *Delivery system*, the second system in the ISF, ensures that innovations are put into practice. The individuals in the delivery System carry out the necessary activities on the front line to utilize the innovation. Members of the delivery system have contextual knowledge about the organization and have influence within the setting. The system is built on information from Synthesis and Translation System and builds on the capacities provided by the third system, the support system (Meyers et al. 2012. 483).

The *support system* increases the likelihood that the innovation will lead to the desired outcomes and provides additional support. The support functions performed by this system are intended to build two types of capacities that are needed to use the innovation effectively: (1) innovation-specific capacity— the necessary knowledge, skills, and motivation which are required for effective use of the innovation , e.g. training on the proper use of an IT system, technical assistance for sustaining effective use the IT system; and (2) general capacity—which relates to effective structural and functional factors, e.g. infrastructure, general level of organizational functioning (Meyers et al. 2012: 483).

The ISF underlines that each system plays a central role when putting innovation into practice. The three systems in the ISF are *mutually accountable* for achieving the necessary standards to reach the innovation´s desired outcomes. The ISF emphasizes the importance of a team-based approach in which implementation teams help foster quality implementation. These implementation teams should have knowledge about the IT solution, expertise in implementation practices and also knowledge about the processes in the customer-organization. In the context of the ISF, members of these implementation teams should include members of the support system and the delivery system.

Support system members can be outside consultants as well as specialists of the provider, which have knowledge about the innovation and implementation methods. The members have the task to ensure an effective implementation process and prepare members of the delivery system to effectively use the innovation (Meyer et al. 2012: 484).

D*elivery system* members can be administrators and leaders with knowledge about the customer-organization and with the necessary decision making power. Members of the delivery system in

implementation teams are essential to infuse local practice-based knowledge and expertise into the implementation process, so the support system can adapt the innovation to the customer organization (Meyer et al. 2012: 486).

4 METHODOLOGY

The initial idea of this project was to cooperate with the company KMD to examine the satisfaction of their customer-municipalities, who use their IT solutions. However, because of internal organizational changes in the company, it did not come to a cooperation with KMD. Therefore, a broader approach is taken in this project. Instead of the focus on a single company, the project focuses on the public IT sector as such, and analyses the common practices and processes as well as rules in sector and how they influence the success of the IT projects.

An explorative approach is chosen to identify the key factors, which influence the outcome of an IT project. The complexity of the public IT sector, due to its strict regulations and recent developments, encourage the use of a qualitative approach. Before potential factors can be analyzed a better understanding of their context is necessary. Qualitative analysis gives insights into causalities, which have to be considered in the analysis. The tender regulations, the dismantling of KMD´s monopoly, the governments aims for an increased digitalization as well as the focus on standardized IT solutions through SKI agreements give the theoretical framework a context, which has to be analyzed. The qualitative study is mainly focus on official documents and interviews with representatives of IT providers and municipalities, but also of central actors like SKI.

In the first phase of the data collection the official documents were analyzed. The collected documents can be divided into four types:
1.) Official documents from public organizations, such as governmental action plans; official publications on the tender process; SKI´s material on their tender processes; documents from municipalities etc.
2.) Official documents of IT providers and their websites
3.) Internal documents of municipalities
4.) Draft K02-contract as well as supplement and commentary
The documents provide the background and contextual information for preparing the interview-guide used in the qualitative interviews, which marks the second phase of the data collection. The documents are used to gather information on central processes in the sector, but also to reject or confirm findings (Gläser and Laudel 2009: 151). The used documents also include digital resources such as websites or other electronic information produced by the organizations.

The second phase of data collection consists of interviews with representatives from IT providers, the municipality and the organization SKI. The data collection focuses on different units of analysis,

because the different perspectives provide insights on the contexts of the public IT sector, the relationship between provider and municipality and its challenges (Yin 2009: 26).

The project uses multiple cases to prove the project´s hypotheses in different organizations, thereby either confirming or rejecting an analytic generalization of the project´s hypotheses (Yin 2009: 39). The interview guide is based on a factual background, which builds on the input in these official documents, and on a theoretical background, which builds on the theories on service quality and the input of the implementation models.

The factual background proves how certain conditions of the service sector can influence service quality. This includes:

- Tender rules
    - Requirement specifications
    - Evaluation process
- Increased competition
    - Dismantling of KMD´s monopoly
    - New competitors
- Standardization
    - Use of standard contracts
    - SKI agreements

The theoretical background is based on Parasuraman et al.´s (1985) concept of the service gap and include theoretical considerations on factors, which influence service quality. This includes:

- Communication Effectiveness
- Relationship Management
- The use of contracts for ensuring service quality
- Use of implementation models to ensure a smooth process

The interviews aimed at getting a deeper understanding of the public IT sector and its mechanisms. The interview guide was continuously developed after every interview, because it provided additional information, which either made some questions obsolete or made a more intensive investigation necessary. This approach was deemed appropriate due to the complexity of the public IT sector and the need to identify success factors for IT projects as well as the need to validate the hypotheses made in the project.

The interview guides´ focus was to gain additional insights on the tender and implementation-process. The factual and theoretical background functions thereby as a framework for the questions in order to identify success factors in these processes and to make causal dependences visible. The interview guide was adapted to the representatives, either when it was an employee working in an IT provider or in a municipality. The combination of the analysis of the official documents and the expert interviews should increase the empirical validation of the results, but it can also be used to identify contractions between both information sources. One example is the way processes were handled differently in municipalities than they were described in the official documents. (Gläser and Laudel 2009: 105).

4.1 CASES: MUNICIPALITIES

The initial cases in municipalities were chosen due to similar size and geographical location. However, due to difficulties in finding interview partners in municipalities, additional municipalities were contacted, so they could act as a substitute. In order to ensure confidentiality in the project the representatives have been anonymized. The municipalities have received a simple letter reflecting the order in which the representatives have been interviewed. The representatives of the municipalities and the IT providers have been assigned fake names.

Municipal	Representatives	Position
A	Cecilie and Marie	Super-user
B	Thomas	Head of IT department
C	Mette	IT Contract Manager
D	Mark	Head of IT department
E	Frederik	Head of the IT project

In total five interviews were conducted with representatives from municipalities. Four of the five municipalities have a similar size and are geographically relatively close to each other. Only municipality E stands aside in this regard. The municipality was chosen as an additional case in the study, because of the information received in other interviews. Thereby municipality E is a special case as it works with a new provider and has applied the competitive dialogue as the tender type.
This case was chosen, because it could give additional insights into the public IT sector. The differences in size and resources, which characterize municipality E, are taken into regard in the analysis. The four other municipalities, which similar characteristics, make the results prone to generalization (Gläser and Laudel 2009: 101-102). The selection of typical cases has the aim to ensure a representative sample, which permits an in-depth study of the causal mechanisms, which are

assumed in the theoretical framework (Seawright and Gerring 2008: 299-300; Yin 2009: 39). However municipality E, as a deviant case, may demonstrate a surprising value by reference to the used theories. The deviant case can give additional information on the municipality faces the same challenges although it has different characteristics (Seawright and Gerring 2008: 302).

The position of the interviewed representatives varied in the interview. In the communication with employees of the municipality, which was led by mail and phone calls, it took often days or weeks, before a representative was found , who would be able to answer the questions of the interview guide. In municipality A, it was the super-users and support team for the municipality´s care solution. In municipal B and D it was the head of the IT department. In municipal C the IT contract manager was interviewed and in municipal E the project leader for the new IT project in the elderly care sector. All representatives were able to answer the questions of the interview guide. While the projects first aimed at interviewing specifically the head of IT departments, the interview with the super-users and the contract manager gave another perspective, which helped either confirming or rejecting certain hypotheses.

4.2 CASES: IT PROVIDERS AND SKI

In addition to the municipalities, representatives of two IT providers are interviewed. The IT providers have not been anonymized, due to the fact that KMD is such a big player on the market and because Systematic is also easy identifiable as new IT provider, due to a very small number of active providers on the public IT market.

IT provider	Representative	Position
KMD	Bjarke	Head of department.
Systematic	Emil	Director

The inclusion of interviewing representatives of the IT provider, beside the representatives of municipalities, was chosen as having a more holistic approach on analyzing the research question. Both research question and main hypothesis are based at the provider's and the municipalities' efforts to close the service gap and secure a successful IT project. In order to take this into regard and to prove the sub-hypotheses the interviews with the representatives of the IT provider are an important source for the analysis. The information given by the provider can also be used to set them in contrast to the information given by the municipalities. It would give input from two perspectives and add additional insights on where the problems for failed IT projects lie and whether the involved parties agree on it. This would validate the results made in the analysis (Gläser and Laudel 2009: 98-99; Bryman 2006: 100f).

KMD and Systematic were chosen, because they are in different stages, when it comes to the market of IT care solutions in municipalities. As stated in s. 2.1, KMD has developed most of the municipalities IT systems in the past and it has the know-how about the systems architecture. This has given KMD an advantage in comparison to other providers. With the dismantling of KMD´s monopoly, KMDs lost some advantages, yet, when it comes to IT solution used in the care sector, still more than half the municipalities are KMD customers (Sorø and Ringsted Kommune 2013:6). KMD has two IT solutions on the market. The older one is called KMD Care but which is now replaced by KMD Nexus (KMD 2015: 10-11; KMD 2016: 9;21).
While KMD is a veteran, Systematic has only recently entered the market for IT care solutions in municipalities. However, Systematic has a long experience for developing IT solutions for the regional health sector. The digitalization strategies of the government and especially its goal to link the first and the second health system closer together give Systematic rise to extent to the municipal care sector. Through their solution Columna Cura, Systematic wishes to introduce an IT solution in the market, which enables municipalities to solve their current task, but easily can be adapted to keep up with future developments in the sector (Systematic 2016; Emil 2016: ll. 28-35).

Both companies are relatively big, but, they are in different positions. While KMD tries to keep/defend its market shares, Systematic is building its influence. In the interviews it will be investigated, how the IT providers attempts to meet the municipalities expectations and also which strategies they have in their respective situations.

Since SKI plays a central role, when it comes to tenders in municipality, an interview with two representatives was held. The intention with the interview was to follow up on questions, resulting from studying their accessible documents, but also to gain insights into internal process regarding the development of requirement specifications and communication with both provider or municipalities.

5 Analysis

The first ch. of the project has given an overview about the public IT sector, its developments and the importance of the tender regulations. The information from ch. 2 is used to structure the analysis, to verify the input from the interviews and to identify causal relationships between the general development in the sector and their impact on the situation of municipalities and IT providers.

The structure of the analysis reflects the tender procedure and implementation process

- The preparation of the tender in the municipality
- The definition of the requirement specification
- The definition of the evaluation criteria and the evaluation process
- The proposals of the IT providers and possible adaptions.
- The issuing of the contract
- The implementation of the IT solution

Ss. 2.2 and 3.2 identify the tender process as an essential factor, which impacts the outcome of the IT project. The analysis will follow the different phases in the tender process and relate to the context information of ch. 1 and the theoretical background of ch. 2.

Ch. 2 provides information on contextual factors, which can affect the tender process and thereby the outcome of the IT product.

This can be an:

- Increased Competition can impact the quality of the IT provider´s proposals in the tender
- The need for municipalities to save resources affect the evaluation criteria in the tender
- Use of SKI agreements and an increased standardization can minimize the use of resources and the risk linked to making a call for tender

Ch. 2 provides theoretical concepts, which are proved in the analysis.

- In a call for tender and in the contract, Service quality factors are stipulated in advance. Contracts include the description of the service level as well as instruments to ensure that the service level is kept.
- Communication Effectiveness and Relationship management as a strategy to close the service gap. Lee and Lee (2014) emphasize the importance of communication effectiveness for the

perceived service quality and the quality of the relationship between provider and municipality. Feedback circles are thereby identified as a central aspect of communication effectiveness.

- The Importance of customer knowledge for solving the challenges in the sector and minimizing the service gap. It will be analyzed in which way the IT providers collect information, but also on how the tender mechanisms ensure or fail to ensure an exchange of knowledge.
- The Co-production of the municipality. There is reciprocal interdependence in the tender and implementation process. Cooperation is essential for a successful outcome of the IT project.

Section 5.1 investigates the preparation phase. Municipalities have to coordinate their effort for the tender process. It will be investigated in this phase, how the municipalities are organized and how the tender process is prepared. Thereby a focus will be on the requirement specifications and how it is defined in each municipality.

Section 5.2 analyses the requirement specification and the challenges to define it and the consequences of imprecise requirements. The s. also refers to other strategies of municipalities to prepare the tender process – such as competitive dialogue, SKI agreement and municipality networks.

In Section 5.3 evaluation criteria are described. The relation between price and quality is thereby discussed and their impact on the tender process.

Section 5.4 focuses on the provider's strategies for the tender process. The s. describes how the providers develop their proposals and how the evaluation criteria affect their strategies. Also, the IT provider´s way on collecting and using customer knowledge is analyzed together with other strategies to close the service gap

Section 5.5 analyses the standard contract K02 and evaluates the function of the contract in regards to matching the expectation between the two parties, organizing the project organization for IT solution´s implementation, defining quality standards and giving instruments of quality control.

Section 5.6 investigates the implementation process and analyses how the waterfall and the agil model affect the implementation process.

5.1 Preparing the tender – Internal Communication in Municipalities

The preparation of an invitation to tender is handled differently in the case-municipalities of this project. Ideally when preparing a call for tender, the responsible center will contact the central administration and ask for assistance with the tendering process one year before the contract for the current IT solution expires.

In the next steps a need-analysis, a business case and a description of the current IT solution as well as the future one is prepared. Together with the recommendation for a certain solution this is presented to the municipality's digitalization counsel, which then reviews the material and approves it. After the approval of the project, a project leader is appointed and a project team assembled, which consists of members from the central administration and the center. Furthermore, the current service provider can be contacted to provide technical assistance. The project team is responsible for the finalization of the requirement specification (Sorø and Ringsted Kommune 2013:20).

This example shows the importance of communication between the different parts in the municipality, when preparing a call for tender. The different types of tender as well as the juridical framework make it necessary to have experts, which have *juridical knowledge*. *Technical knowledge* is needed to ensure that the requirement specifications are sensible and up to date with actual IT developments. In addition, *expert knowledge* about the task and the needs, which the IT solution relates to, is necessary when preparing the tender.

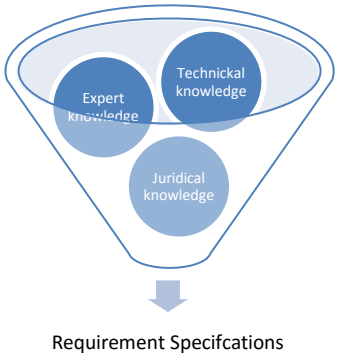

Figure 4 Three forms of knowledge

The interviews with the representatives of the municipalities show the difference in organization. While some municipalities were organized in a centralized structure, others had a decentralized

organization structure. This affects the processes behind the preparation of a call for tender. Examples of are decentralized municipalities are municipality B and D, in which the centers are more independent and have their own tender budget (Thomas 2016: ll. 11-25). Representatives of the IT department in municipal B and D indicate a lack of communication between the IT department and the centers. The point at which the IT department was included in the tender process varied considerably. While the IT department was part of the tender process from the start in some projects, it was only contacted when the center encountered problems in the tender process on other occasions (Mark 2016: ll. 429-433; Thomas 2016: ll. 15-19). Thus, the IT department has varying influence on the formulation of the requirements for the IT provider. This can have negative consequences for the price and quality of IT provider´s final proposal.

S. 2.2.1 emphasizes that a call for tender has to be well prepared. Exchange of information and experience between the different stakeholders such as the relevant center, the IT department, experts on the law on tender in the municipality increases the chances of finding the right solution, when making a call for tender.

The process for preparing a tender or defining the requirement specifications is more regulated in municipality C, which has centralized the budget for the acquisition of IT systems (Mette 2016: ll. 68-73). In municipality C, the communication between the centers and the central administration is regulated through the position of a contract manager. This position is currently occupied by Mette, who is responsible for all of the municipality's contracts with IT providers. She must be contacted, when a center or department in municipality C wishes to prepare a call for tender. Then the IT contract manager acts as a consultant and supports the centers. The consultation stretches from screening whether similar systems already are used in other centers in the municipality to checking the use of SKI agreements or going through the different types of tenders. With Mette´s position, municipality C has centralized its IT contract management and improved the quality of control in their tender preparations. Contract management also includes scanning the tender material to check if the requirement specification adheres to the juridical and technical standards (Mette 2016: ll. 20-27). In Municipality C also a *step by step-plan* has been developed for the purchase of IT solutions in the centers. This plan standardizes the internal processes aiming to ensure a better quality in the definition of the requirement specifications and the ability to acquire better and cheaper IT solutions for the municipality (Appendices 9.1).

Thomas explains that Municipality B plans to streamline the internal processes before a call for tender is made, so the IT department will be included from the start (Thomas 2016: ll. 23-25). Even before the IT provider is chosen, communication between the different stakeholders and an exchange of

knowledge is essential for a successful tender process. For the requirement specification, the three identified knowledge areas (*technical knowledge, juridical knowledge* and *expert knowledge)* have to be combined to make an adequate requirement specification.

5.2 Requirement Specifications – Setting the expectations

Requirement specifications summarize and record the municipality's expectations for the IT solutions. They play a crucial role in tenders and, as earlier mentioned, they are an important factor that can either increase or decrease the service gap. The IT provider´s access to these requirement specifications may lead to the assumption that it is easier to deliver a fitting solution to a customer, especially compared to other service sectors, where providers have no access to a list of customer expectations. However, both literature and interviews indicate, that formulating the requirement specifications is a challenge for municipalities. Often the requirements are not precise enough or difficult to interpret by the IT provider.

Unclear and not well-researched requirements specifications can lead to misunderstandings with IT providers and unsatisfying proposals. Lauesen (2016) has analyzed several requirement specifications of Danish municipalities. In his findings, he points out that the requirements made by public contractors often do not cover the respective working processes in the organization sufficiently. As a consequence, the new IT solution can still be inadequate, even though the provider meets all the formal requirements made by the contractor (Dragsted et al. 2008 129). The challenges, referred to in s. 2.2.1, are confirmed in the interviews by both municipalities and providers.

The misunderstandings start during the defining of the requirement specifications. Thomas from municipality C argues that employees in the centers have difficulties in formulating their needs in language that is understandable for the provider.

> *"Det ofte meget svært til at få folk til at formulere hvad det egentlig er, de gerne vil have. Så at leverandøren også forstår det. Fordi det er jo det, der er problem. Det er fordi man tolker det forskelligt og det er fordi man opfatter det man har læst forskelligt og man ikke været klart nok i spyttet, når man har kravspecificeret. Det vil jeg sige er det allerførste, at bliver superklar på hvad der er. At du kravspecificere og så få det formuleret på en måde, så man ikke kan misforstå det* (Thomas 2016: ll. 137-142).

Claus and Søren from SKI also hint at these misunderstandings. In their experience municipalities do not know what they have to include in their requirement description (Claus and Søren 2016: ll. 265-269). Emil from Systematic names a common mistake made in requirement specifications by

municipalities: Instead of describing their needs and their problems for the IT provider to design the solution, municipalities often describe the desired functions of the IT solution. This however increases the chances of misunderstandings as the contractor often has a limited expertise in technical questions.

"Og det er nogle gang, hvor du vender den om og lige pludselig sidder kunden og beskriver et system og leverandøren skal forsøge at beskrive problemerne, hvor der er omvendt (Emil 2016: ll. 196-199)."

As a result, the requirement specifications represent a risk for both parties. Bjarke from KMD explains that the provider in most cases only has access to the material for preparing the proposal for the tender (Bjarke 2016: ll. 30-35). The lack of dialogue about the requirement specifications increases the risk of misunderstandings. This can have negative consequences for the whole project. Emil and Frederik confirms these consequences: 'Imprecisions' in the contractor´s description can lead the provider to spend several months developing a solution without being able to meet the relevant needs. Consequently, months of work can be lost (Emil 2016: ll. 202-205; Frederik 2016: ll. 390-402). Also in Thomas´ experience misunderstanding in the requirement specification lead centers to purchase IT solutions, which do not support the relevant working processes (Thomas 2016: ll. 312-322).

"*Det er det hvor kravspecifikationen skal være. Hvor du skal være super skarp, inden du køber noget. Du skal også være i stand til i virkeligheden og identificere hvad er der i virkeligheden for nogle processer, som det her skal understøtte. For du risikere at købe systemer, som slet ikke understøtter de der processer, som du gerne vil have understøttet* (Thomas 2016: ll. 312-315)."

Imprecisions in the requirement specifications can also simply result in a higher price for the municipality. The more unrealistic and uncalculatable the requirement description, the more likely the IT providers will include risk-bonus, which increases the final price of the proposal (Dragsted et al. 2008: 89).

As described in s. 4.1, responsible employees in the municipality have to be aware of the needs and the working processes, which have to be supported by the IT solutions, when preparing the requirement specifications. Therefore, coordination between the center, the IT department and other relevant organizations in the municipality are essential. The coordination is also important since the employees in the center and the IT department may have different priorities when it comes to the requirement specification. This is also reflected in the interviews. For Mark at the head of IT department in municipality D, the reliability of the IT solution is seen as a major requirement (Mark 2016: ll. 156-158). Yet, for Cecilie and Marie, who are the super-users in municipality A, an easy-accessible user

interface should be a requirement for a new IT care solution as well as well functioning support service (Cecilie and Marie 2016: ll. 153-156).

The representatives' priorities are based on the challenges they face in their daily work. In order to formulate a precise and comprehensive requirement specification, the municipality must invest resources and time in its preparation. Internal communication is thereby a key element as well as having the required expertise in the three knowledge fields described in 4.1.

For Frederik from municipality E it is nearly impossible to define a proper and precise requirement specification, which is understandable by the provider and also support the municipalities working processes. His argument is based on the fact that only a close dialogue with the IT provider makes the definition of a precise and well written requirement specification possible (Frederik 2016: ll. 390-396). However, when using the standard tender, the rules on tender restrict the frequent and bi-directional communication between customer- and provider.

"Og så er det sådan at du må jo ikke have en dialog med leverandøren ifølge udbudsreglerne. Ikke sådan en. Jeg kunne godt tænke mig det her, hvad koster den hos jer dimsagtig... det må du ikke have. Du må have det, der hedder teknisk afklaring, hvor du spøger ind til funktionalitet, du må ikke går ned i detaljerne og snakke hvad koster det og så videre, så bryder du udbudsreglerne. (Thomas 2016: ll. 143-146)."

Dialogue options and the coordination with the IT provider is important, as requirements specifications cannot easily be changed, once they have been published in the tender. This underlines also the responsibility of the municipality for the success of the IT project. The IT provider is dependent on the information of the municipality as his efforts to support the municipality are limited and the provider can only react to information given by the municipality (Dragsted et al. 2008: 91).

This underlines the aspect of *co-production*, described in s. 3.3. First, the municipality must establish the basis, which is crucial for purchasing the right IT solution. Second, the municipality has to cooperate by contributing with knowledge about its needs and the relevant working processes (Dragsted et al. 2008: 91). It is the responsibility of the municipalities that the requirement specification is thoroughly and precisely formulated. Otherwise, both sides may come to interpret the requirement specification differently, which can lead to a mismatch of expectations and, consequently, to an increased service gap.

The risk for municipalities to end up with a solution, which does not cover the needs, leads them to be more careful. The interview with SKI shows that requirement specifications often build on previous

ones. While this kind of *playing safe* can neglect innovative products and features, which in fact could benefit the sector (Claus and Søren 2016: ll. 42-46; 80-84). This is also a risk described by Dragsted et al. (2008:129). The requirement specifications often reflect the actual working processes in the municipality to such a high degree that they do not give room to innovation or new ways of thinking.

The focus on the requirement specifications can also influence the IT providers on the market, as innovative solutions are not necessarily rewarded. Cecilie and Marie explain that companies like KMD just update their existing solutions and do not think *out of the box*. Thus, progress is often slowed down, because these solutions are favored by the *price* instead of other innovative aspect, which potentially could save money in the long run and meet the expectations of the users (Cecilie and Marie 2016: ll. 317-330).

The reluctance to develop more innovative IT solutions in the care sector, which might exceed the expectations in the municipalities, is also due to existing insecurities. This is especially the case when it comes to the stability of the system or to the competence of support services. In the care sector, it can cost lives, if there are technical problems with an IT solution or the company is unexperienced in the area (Mette 2016: ll. 272-279).

To summarize the input from the interviews, requirement specifications have a strong impact on the service gap. The lack of dialogue options between provider and municipality increase the risk of misunderstandings. Tender regulations compromise the *communication effectiveness* defined in ch. 3.3. The tender process gives only limited room for a *frequent communication* and a *bi-directional communication*. This impedes the matching of expectations between both parties and can affect the outcome of the IT project in a negative way. While the standard tender hinders dialogue options, the introduction of the competitive dialogue sets the dialogue in the focus of the tender process (Dragsted et al. 2008: 547).

5.2.1 Competitive Dialogue

Systematic and municipality E have experiences with the competitive dialogue as a tender type to overcome the barriers for communication which is seen in the standard tender procedure. By using competitive dialogue the contractor does not have to define the requirement specifications when making the call for tender (s. 2.2.3). This tender type is more flexible and ensures an increased *communication frequency* and a *bi-directional communication* between provider and municipality through the dialogue phases. The tender type was used in municipality E with the IT provider Systematic as the winning provider.

Before municipality E published the call for tender for its new IT care solution, there has been a long preparation process, which also resulted in a memorandum on the strategy on the area. The memorandum presents a need-assessment, which takes the national strategies for digitalization and elderly care, current technical standards as well as the aim to increase the satisfaction of citizens and users into account. Besides, there is a strong focus on innovative systems with compatible interfaces that can provide the basis for an IT ecosystem in the municipality. This basis-system for the ecosystem should be stable, easy to use and accessible for other developers (Muncipality E 2015).

When applying the competitive dialogue in public procurement, Frederik in municipality E was not bound to certain requirement specifications when he first approached the different IT providers. This gave more flexibility in evaluating current solutions on the market and gain insights on their advantages and disadvantages. The tender type allows dialogue with the IT providers and using their input in developing the requirement specifications in the process. Such a cooperative procedure is not possible under the standard tender process.(Frederik 2016: ll. 28-30).

Systematic prefers the competitive dialogue as tender type too, because it gives the company more options in developing a solution that meets the municipality's needs. When developing IT solutions based on pre-defined requirement specification, there is a high risk that the solution will not fit to the desired needs. The competitive dialogue can close this service gap by giving provider and municipality more options to work together when developing the IT solution. Columna Cura was developed specifically for the needs of municipality E (Emil 2016: ll. 34-37; 199-202; 308-310).

In terms of Gummesson and Grönroos´s (1987) model the competitive dialogue especially strengthens the *design quality* as the municipality participates in the development process, which aims to identify and meet the municipality´s needs. The focus on cooperation also increases the trust between the two parties, which can improve the *relation quality*.

Another important strategy in municipality E combined with the competitive dialogue was the approach to involve all stakeholders in the development process. The implementation of a new journal in the elderly sector affects users with various backgrounds (SoSu Helper, nurses, physiotherapists etc.) that work in different areas like residential care, home care etc. (Municipality E 2016a). These groups face different challenges and have their own priorities and requirements, when it comes to a new IT solution. As mentioned earlier, this means that the municipality must have good communication channels to filter their input and define a requirement specification, which is relevant and aims to benefit all stakeholders (Frederik 2016: ll. 40-51). In municipality E, the stakeholder feedback has been used to continuously specify the requirements for the new IT solution. The use of

competitive dialogue and a diverse project group has the benefit that the stakeholder-representatives in the project group come in contact with the IT provider and their colleagues under the development of the IT solution. Thus, they get informed by the technical possibilities on the market, the requirement of their fellow colleagues and can provide their knowledge. This equals expectations between the developer and municipality and between the different professions at the municipality. Regarding a possible service gap, the inclusion of the stakeholder groups, thus, increases the chances of a more positive perception of the IT solution among all stakeholders. This can also benefit the implementation process in the municipality as is described later. The competitive dialogue shows many promising aspect which can help to close the service gap, however it´s application is based on many conditions - described in s. 2.2.3 (Frederik 2016: 121-125).

5.2.2 SKI AGREEMENTS AS A WAY TO REDUCE THE SERVICE GAP?

SKI´s framework agreements for IT solutions are used by municipalities in different areas. In three out of the five municipalities a SKI agreement on an IT care system was used. SKI offers several advantages for municipalities. Instead of every municipality is going through tender processes on their own in different areas, SKI organizes the tenders for specific IT solutions on a national basis. Furthermore, SKI aims to find the *most economically advantageous* product and the municipality can choose the IT provider by *direct allocation*. The IT solution, which received the highest score in the SKI tender, is automatically chosen by the municipality. Hence, the price and quality level are fixed. The municipality can also apply a so called *mini-tender, i*n which a short requirement analysis, for example to aim at specific quality levels. By using SKI, the municipality does not have to define an extensive requirement specification, as SKI has already done that beforehand (Mark 2016; SKI 2015d: 8).

Mette sees the advantages of SKI especially for smaller municipalities. When using the *direct allocation,* as it was done in municipality C, no requirement specifications has to be defined and less resources are used when acquiring a new IT solution. Mette also considers a standard solution sufficient for a smaller municipality, while bigger municipalities have different working processes (Mette 2016: ll. 312-319). Mark from municipality D also finds that the municipality does not have to develop a requirement specification from scratch, which saves resources (Mark 2016: ll. 58-60*).* Thomas of municipality B describes SKI framework agreements as *one size fits all–solutions*. He underlines the positive effect, when it comes to buying standard goods, because the municipality can save the time and resources, it usually takes to submit a tender. However, he has a more critical view when it comes to use of SKI agreements on more complex IT solutions. He describes SKI agreements as being generic, because IT providers have to submit a solution, which basically must fit to every municipality (Thomas 2016: ll. 348-351).

A high degree of standardization has led to compromises in the municipalities as the standard solutions do not always fit to the local working processes. This indicates one of the main challenges for SKI. With the requirement specification for the SKI agreement, IT solutions, which appeal to as many municipalities as possible, must be found. Thereby SKI must have a customer-and market-knowledge in order to be aware of essential requirements. Although SKI offers different quality levels in their SKI agreement, adaptations are only limited. If a municipality wishes features of IT solutions, which are not part of the SKI solution, it has to make its own call for tender (Claus and Søren 2016: ll. 96-101; 118-129). This may be the result of the SKI agreement already being some years old or the desired features were not part of the requirement specifications in SKI´s tender. Therefore, municipalities must make their own tender, if they want more customized solutions or sometimes even a cheaper solution (Mette 2016: ll. 332-330*;* Mark 2016: ll. 65-85). Mark and Mette have different opinions regarding the gain of the SKI agreements. This hints at the risk, which is linked to every tender. If requirement specifications have been unprecise in a tender it may increase the prices of the incoming provider-proposals. These risks do not exist, when choosing a SKI agreement as the contents of the providers proposal have been made transparent and the municipality can decide if it would choose the SKI agreement or make their own proposal. Thus, SKI reduces the uncertainty for the contractor. It also reverses the tender process, as the contractor gets insight in the IT provider´s proposals, before the municipality chooses them (Claus and Søren 2016: ll. 96-106).

SKI can reduce the service gap, while it makes the IT providers proposals more transparent, but this has also an impact on the general progress in the sector. It is challenging for SKI to define requirement specifications, which fit to present solutions. Defining requirement specifications which are future-oriented is not part of the SKI strategy. SKI agreements last 4 years. Only after this period a new call for tender is organized by SKI. This means four years must pass before a new IT solution can be sold via a SKI agreement. If municipalities chose a SKI agreement, they also sign a 4 year contract, which limits the chances of reacting to innovations in the sector (Claus and Søren 2016: ll. 80-84; 215-223).

The nature of SKI can also limit competition. Providers only have the chance to come onto a SKI agreement every 4 years. Some agreements only work through direct allocation, giving the SKI provider with the highest score access to the public customers. Furthermore, SKI rules also slow down innovation, as new IT solutions have no immediate possibility to become part of existing SKI agreement. Frederik views the use of SKI agreements as a balancing act: on the one hand it saves resources, but on the other hand it can hinder progress. Frederik goes as far as finding that SKI limits competition and innovation on the market.

"Der har du fuldstændig ret i og der også min pointe. Det er meget godt og det er meget praktisk med SKI aftaler, men det hæmmer innovation og fremmer monopoldannelse (Frederik 2016: ll. 114-115)."

5.2.3 NETWORKS OF MUNICIPALITIES – AN ALTERNATIVE TO SKI

Although the interviews made are not representative for all of Denmark's municipalities, together with the input from SKI´s representatives they indicate, that municipalities frequently choose SKI agreements for their IT care solutions. As described, many municipalities use SKI, because they want to minimize the risks and the costs when making a call for tender. S. 2.2.4 emphasizes the importance of price, when choosing a new solution. When municipalities want to have a more customized IT solution and reduce the resources used for a tender, they can prepare a call for tender in close cooperation with other municipalities. Two of the five municipalities were engaged in cooperative networks with other municipalities, while a third has concrete plans to join such a network in the coming year (Cecilie og Marie 2016: ll. 84-91). These networks enable municipalities to pool experiences and resources to make call for tenders for more customized solutions. There is also a growing trend to build on the experiences of other municipalities. Emil from Systematic states that the pilot project of Columna Cura in municipality E has attracted attention from other municipalities, who have contacted representatives from municipality E to tell about their experiences.

"Så det vi kan se lige nu. Det er flere kommuner, der går i samarbejde med Kommune E, frem for at går i dialog med os, fordi de gerne vil vide, hvad Kommune E´s tanker har været. Det kunne være fedt, at egentlig festholde de relationer mellem kommunerne frem for det bliver relationer til Systematic kun (Emil 2016: ll. 132-135)."

The sharing of knowledge with other municipalities has grown in the last years. The interview with Frederik and the input from Marie and Cecilie indicates that knowledge about promising solutions spreads among municipalities. In municipality A, the representatives have heard about municipality E´s success with Systematic. The sharing of information improves the chances of solutions seen as good practice, to spread to other municipalities.

Tenders made by cooperative networks represent a middle ground between individual tenders and SKI agreements (Claus and Søren 2016: ll. 286-292). Cooperation is a chance for smaller municipalities to aim for more customized IT solutions in tenders, instead of purchasing from SKI. However, the coordination between the municipalities can be cumbersome, as the municipalities most likely have contracts with different termination dates, which can create extra transaction costs (Mark 2016: ll. 30-33).

5.3 Evaluation Criteria – Price over Quality?

As described in ch. 1, the evaluation criterion *most economically advantageous tender* is the most widespread criteria among public contractors when purchasing a new IT solution. It has been applied in all the represented municipalities in the project (Mette 2016: ll. 286-296).

In most tenders, this means that quality and price are both weighted with 50%. However, it also happens that the price plays a more important role and municipalities weigh 60% price and 40% quality. This is the case in municipality A (Cecilie and Marie 2016: ll. 38-45). When prioritizing price, Cecilie and Marie argue, that they as system administrators and user representatives have less influence in choosing a provider. This is because quality features described in the requirement specifications have less influence.

"Jeg ved godt at det er andre kommuner som vægter det 50:50 med pris og kvalitet. Der kan du se at du har lidt mere indflydelse som systemadministrator eller som brugere (Cecilie and Marie 2016: ll. 48-50).

This view is confirmed by Thomas, who underlines that when prioritizing price certain support services offered by the IT provider do not have the same quality.

"Hvis du sætter pris som det højeste. Så får du en billig pris og en lorte service. Sådan er det bare. Der hvor du køber en meget meget standardiseret ydelse (Thomas 2016: ll. 95-96)."

According to Thomas, different weightings in the tender process have a political origin. If there is the need to save money in the municipality, the price is weighted higher. If the focus is on improving the municipality's services, quality is weighted more.

"Så tit er det objektive krav, der bliver lagt. Om det så er pris eller kvalitet eller hvad der er, der tæller mest. Det er i højt grad et politisk spørgsmål. Altså, hvad vil man her. Vil man gerne spare noget penge, så er det selvfølgelig prisen der tæller højt og vil man gerne have en bedre service, så er det kvaliteten der tæller højt (Thomas 2016: ll. 71-74)."

Priorities for tender are made or confirmed by the political actors in the municipality. These end in most cases in a 50:50 weighting key or in a focus on price (60%). Mark from municipality D underlines this fact by stating that price is often prioritized, because the municipality is managed this way (Mark 2016: ll. 365-366).

Municipalities have different leadership levels, which are hierarchical organized. These leaders may have different foci when it comes to defining the evaluation criteria and their weighting. To illustrate the problematic, there can either be leaders with a specialists or a technical focus, which affects the

focus on for quality and price. Depending on the leaders involved in the IT tender, it can influence the priorities in the evaluation criteria. Mark hereby claims that price and speed of implementation are important factors for administrative leaders (Mark 2016: ll. 341-347).

For the SKI framework agreements called 02.19 – which include IT care solutions, SKI has described part of the evaluation criteria to make the assessment of the different tender proposals more transparent. The evaluation criteria *most economically advantageous tender* is also used by SKI for its agreements. There are three sub categories *Price, Quality* and *Assortment*, the weighting of these categories differs, depending on the solution. For IT solutions in the care sector, it is Price (40%), Quality (40%) and Assortment (20%). These criteria are then again divided into sub-criteria (SKI 2016). The transparency of the evaluation criteria gives the provider better insights into the assessment process, which can be used to adjust the tender-proposal, so it fits better to the municipality's priorities. While this helps the IT provider, it makes the evaluation procedure more inflexible for the contractor as the municipality is bound to these criteria. Even if certain tender proposals include functions, which would be beneficial for the contractor, they cannot be taken into regard, if they are no part of the evaluation criteria. This underlines the importance of researching the sector and staying updated about the technical progress, before deciding on the requirement specifications and evaluation criteria (KFST 2016a: 6).

Actual strategies applied by municipalities and SKI in the evaluation process are business and use cases. Hereby, IT providers must prepare a case, where they have to describe how they solve certain challenges and receive points for it (Mette 2016: ll. 286-296). This gives municipalities more flexibility in the evaluation process. Using use and business cases in the tender can thus be used to reward innovative solutions. In the interviews with the representatives it became clear, that next to the official evaluation procedure other more soft factors can decide, which IT solution is chosen. Both Thomas from municipality B and Mark from municipality D name *chemistry* as a decisive factor, when choosing an IT provider in a call for tender. While *chemistry* was not operationalized by the heads of the respective IT departments, it confirms that other more personal factors also play a role in the evaluation procedure. In the interviews *chemistry* hints at personal attributes of the IT providers' representative as being attentive and responsive.

"Og så kan jeg også sidde overfor en, som bare er åben, opmærksom, lyttende, engageret, involverende, reflekterende og hvor jeg tænker, du kan få alle min penge. Du er super sød og du ved godt, hvad det er, vi vil gerne have. Og jeg har en tillid til at du skal nok sørge for at få de der ting på plads (Mark 2016: ll. 376-379)."

Thomas describes that a good *chemistry* makes it easy to communicate and that the provider's

representative must be responsive to feedback (Thomas 2016: ll. 290-292). One further attribute used by both Mark and Thomas in connection with *chemistry* was trust. This is also an important factor for Mette, when it comes to the communication with the IT provider (Mette 2016: ll. 191-198).
While chemistry and trust are not operationalized, the interviews hint at the 5 dimensions of service quality (s. 3.1) by naming certain attributes like:
- Being responsive and using feedback, which are indicators for *Responsiveness*
- Trustfulness, which often results from *Reliability and Assurance*
- Being attentive, honest and listening to feedback are indicators for the factor *Empathy*

The representatives indicate that not only the technical quality of the IT solutions is decisive, but that also the functional quality, the way services are delivered, plays an important in the evaluation process.

5.4 IT PROVIDERS STRATEGIES FOR TENDER PROPOSALS

In the standard tender, the IT provider must react to the tender material published by the public contractor, especially the requirement specifications. As described in the last two chapters, the provider is challenged creating a proposal, which meets the requirement specification of the tender and deliver a solution which fits contractor's needs. Moreover, the provider has to offer this solution at a low cost. The evaluation criteria make it hard for providers to balance between *low price* and *high quality* in the solution development. Bjarke from KMD states in the interview, that the revenue made by selling an IT solution to IT contractor only is possible when the municipality remains a customer for at least 8 years (Bjarke 2016: ll. 279-284).

To keep the prices of development and operations costs low, it is common for IT providers to develop standard solutions. As indicated in the interviews, municipalities have similar tasks. As a result, IT provider can save development costs and offer their standard IT solution in most of the tenders, made by municipalities. Due to SKI standard solutions have become much more widespread, which raises a central question in the project; Are working processes in municipalities adapted to the solution or is the solution adapted to the municipalities' working processes?

In relation to the research questions, this also means to which degree the expectations must be adjusted to the standard solution as well as whether this increase the service gap or it already is adjusted to receiving standard solutions. Representatives in the case municipalities hint at the differences between municipalities. This can be differences in the requirements for a new solution, because features may be demanded, which are not part of the standard version or it can be due to differences in the working processes (Thomas 2016; Mark 2016).

One strategy of the providers to make their standard solutions more flexible is using modules, which contractors can buy on top of the standard solution. For instance, if KMD´s solution primarily supports the residential and home care additional modules for physiotherapy can be purchased on top of the standard solution. Emil from Systematic describes the adaption with buying a car, where you have fixed prices, but if you want extras, it becomes more expensive (Emil 2016: ll. 217-218). Besides, while the license for IT solutions are a fix costs. Support and consultation hours are not included in it. The IT provider determines hourly wages for these services in the proposal. Due to this high wages, Cecilie and Marie perceive it as a way for the provider´s to increase its revenue (Cecilie and Marie 2016: ll. 59-65). From the IT provider's perspective, the high prices are a result of municipalities focus on *price* in the tenders and the competition with other providers. Providers develop more standardized proposals to stay competitive. Bjarke from KMD explains that making low cost-proposals is important, because they have a better chance of winning. According to him, KMD does not add services, such as change management or additional features, when the price is the decisive criteria. This indicates that going after the cheapest solution in the tender automatically limits the municipalities´ options, both in regards to choose an innovative product, but also regarding the adaptation of the IT solution to local working processes (Bjarke 2016: ll. 131-143).

5.4.1 Collecting Customer knowledge

Customer knowledge plays an important role for IT providers to develop their IT solutions and to increase their chances of winning the tender. Next to technical knowledge, which describes the provider's ability to develop an effective solution and methods to coordinate and implement projects, customer knowledge is essential (s. 3.4).

When developing a new solution for the municipal care sector, the IT provider must have general knowledge about the sector.

- About actual standards (technical and medical)
- About the municipality's tasks, which have to be supported by the IT solutions
- About the users (different professional backgrounds of future users)

Besides, the sector is subject to constant changes. The Digitalization strategies of the Danish government set new requirement for future IT solutions, such as a better communication between the secondary and primary health sector. The knowledge necessary for being successful in the sector makes it difficult for new companies to enter the market. This also applies when faced with requirement specifications, which can be hard to decipher and often are orientated at existing solutions (Thomas 2016: ll. 407-414).

Detailed knowledge about the specific customer municipality is useful. Bjarke reports that KMD tries to collect as much information as possible about the municipality before the tender material is prepared (Bjarke 2016: 166-177). For IT providers it is important to constantly collect feedback from its customers, to keep their knowledge up to date and be informed about current challenges (ch. 2.3).

Feedback is therefore an important of the *bi-directional communication* between provider and municipality. It can be collected, when the municipalities report errors to the IT provider, which can be the basis for future updates, or it can be collected on initiative of the provider. IT provider can use their relationship with customers to inquire about daily challenges and future needs in order to improve their IT solutions in the long run. For Emil at Systematic, these are central factors for developing a good IT solution (Emil 2016: ll. 222-229).

KMD still dominates the care sector with its IT solutions, Care and NEXUS. The company therefore has access to several municipalities. The ability to collect feedback is a competitive advantage, even more so as communication with the municipalities becomes limited under the tender process. Therefore, KMD has created a communication channel to collect feedback (Cecilie and Marie 2016: 396-412). In this network, municipalities can pay a certain fee to participate in making updates for KMD Care and also contribute to the development of KMD Nexus.

5.4.2 Change Management and agile project management

The representatives of KMD and Systematic both emphasize that current methods in regards to tender (standard tender) and implementation (waterfall method) have some crucial disadvantages, especially because they lack ways for both parties to exchange feedback.

In order to overcome these disadvantages, which are often rooted in the tender process, both companies have developed strategies to increase the communication effectiveness between provider and contractor. KMD offers a change management procedure in combination with its IT solution. Thereby the company works closely together with the municipality to realize concrete aims by optimizing working processes.

Whether these strategies are applied depends on the municipality. If the municipality has a low IT maturity or the price is the focus of the tender, KMD will only offer a standard procedure. If the municipality has a high maturity and price/ quality are equally weighted, change management can be offered as an additional service to the municipality (Bjarke 2016: ll. 131-143). When preparing the proposals, Bjarke underlines the importance to analyze the customer and its requirement specification to make sure which strategy to use.

"Så de findes i alle afskygninger de her kommuner og der bliver man simpelthen nødt til som leverandør at tage ansvar for og lave en tilstrækkelig præcis analyse hvordan kunden er og så levere det, som kunden gerne vil have (Bjarke 2016: ll. 159-161)."

Bjarke also confirms the risk of losing the innovative potential in tenders, when applying requirement specifications. The representatives in the municipality do not often have imagination nor technical expertise to imagine a new innovative solution. Instead, they picture an improved version of the current solution (Bjarke 2016: ll. 197-205).

Systematic, as a new player, did not enter the marked with a fully finished product for the IT care sector. Rather, their approach has been to develop parts of their solution in close cooperation with a municipality. This was only possible, as municipality E chose the competitive dialog as a tender type. This tender type offered the possibilities to exchange feedback at a regular basis and finish the development, so it fits specially to municipality E´s needs.

Emil from Systematic explains that their approach to the sector differs from other IT providers. Not only because they construct the first version of their product together with municipality E, but also in their way of using the agile model in the development process. Thereby employees and project leaders have their own office at Systematic to ensure a constant contact and shorter feedback circles. The short feedback circles of the agile method are used to constantly adapt and update the current version of the product. The actual version of the product is thus shown to an audience of leaders or end-users to get feedback. This should ensure that the development is going in the right direction and that it covers the needs and challenges of the municipality (Emil 2016: ll. 33-41; 62-66).

Emil underlines in the interview that Systematics knowledge of the sector and the feedback of the municipality is used to create solutions, which bridge the service gap as best as possible (Emil 2016: ll. 78-82).

5.5 THE IMPORTANCE OF CONTRACTS FOR ENSURING QUALITY STANDARDS

When an IT provider has won the tender, the contract marks the end of the tender process. The contract regulates the relationship between the public contractors and the provider. The contract K02 was used in all the case-municipalities, although in municipality E the contract was modified due to the agile model in the tender. K03 was not considered, because there was not enough experience the concept in the municipality (Emil 2016: ll. 154-156). The rules on tender determine the legal

framework for the contract and the contractual obligations for provider and contractor. The use of the K02 ensures the adherence to the public procurement rules. (Dragsted et al. 2008: 547).

The K-contracts give the municipality a legal instrument to ensure that certain quality standards in the agreement between municipality and IT provider are kept. It also gives room for municipality and provider to adapt the contract to their agreement and the individual service provision (Digist 2007a: 14; 21-22; 40). In addition to the K02-contract, there is also a contract supplement, which provides additional information and guidance to the municipality and the IT provider about the contract´s content and its use (Digist 2007b:1).

According to Dragsted et al. (2008:83), if the contract is used correctly it can ensure the following:S

- a clear division of responsibilities
- a detailed planning of the project´s steps
- the adherence to the agreed quality-standards
- the documentation of changes to the project

5.5.1 CLARIFICATION PHASE

The clarification phase (Danish: Afklaringsfase) is a central part of the K-contracts, where provider and contractor meet to prepare and coordinate the project as well as concretize the content of the tender. This phase allows the providers to get better insights into its contractor´s needs and processes and to assess whether the contractor´s IT environment meet the technical requirements of the providers' solution. The contractor can use this phase to get a better understanding of the providers' IT solution (Digist 2007a: 14; Dragsted et al. 2008: 151; Bjarke 2016: ll. 27-37).

The clarification phase is an important part of the tender and the contract, as it allows both parties match their expectations in regards to the implementation process. This is crucial as the signing of the contract can lead to conflicts, for instance, if meeting the contractor's requirements takes more resources than estimated by the provider. In this phase, both parties have the chance to further discuss the content of the tender and in some cases also make changes, before the implementation process is initiated. However, the aim with the clarification phase is not to extend or to change the requirement specification, but to clarify possible obscurities and to regulate reservations, which the provider possible made in the proposal. The law on tender set limits for both parties on the degree of which they can change either the requirement specifications or the proposal (Dragsted et al. 2008: 67;159-160).

Although changes are not encouraged by the strict laws on tender and have to follow a strict documentation, they are still common when it comes to more complex IT solutions. Referring to Dragsted et al. (2008: 201-203) changes to contracts and the agreed *base line* happen more often than not. These changes are based on reservations made by the provider and be discussed in the clarification phase, or they are made later in the implementation phase, when the need for adaptions becomes evident. The documentation of changes is important, so they always can be traced back to the original base line of the tender. The law on tender also gives the provider responsibility for the documentation. If the provider accepts changes without documenting them in the change log, the provider will be unable to demand payments or change the agreements of the contract (Dragsted et al. 2008: 69; 199).

Co-production is also a central aspect in the clarification phase, the contractor has to give the provider additional knowledge about the organization, it´s workings processes and the IT environment to ensure a smooth implementation (Dragsted et al. 2008: 179). For Emil from Systematic, the clarification phase is less used for talking about the IT solution, but more about how contractor and provider cooperate in the project (Emil 2016: ll. 254-261). One way the cooperation is described in the contract, is through the obligation of both parties to agree on reporting errors in the tender documents composed by the other party. This should ensure that provider and contractor use the knowledge in their respective fields of expertise correctly and counsel each other. It is regulated in the contract through a so called *reaction time*, which should encourage provider and contractor to react quickly, so at a later stage they cannot be held responsible for errors. Hence, both parties have to be attentive in the project, in order for errors to be identified at an early stage (Digist 2007a: 16; Dragsted et al. 2008: 183).

In the clarification phase, both parties also have to agree on the general time schedule for the project and its key stages (Digist 2007a: 6-9). The general time schedule structures the entire project into phases describing the key activities as well as setting of deadlines. Both parties must agree on the criteria when one phase is seen as complete, for example successful test runs of the software (Digist 2007b: 6-7;10).

5.5.2 STANDARDS FOR PROJECT ORGANIZATION

In order to secure a smooth implementation, provider and contractor must establish a project organization that handles and coordinates the implementation process. The project organization is divided into a steering group and a project management group. The members of these groups are employees from the contractor and the provider, who have insights into the project and the necessary decision power to make adjustments. (Digist 2007b:16;59; Dragsted et al. 2008:80;167).

This kind of project organization is used, when applying the waterfall implementation model or the agile model (Emil 2016: ll. 269-276). The steering group has scheduled meetings where the progress of the projects, possible problems and risks are discussed. The steering group marks the top level of the project organization, where one of the contractor's employees has the role as the head of the group.
The project management group has scheduled meetings until the IT solution has been implemented. In these meetings, the time schedule and possible changes to the projects are discussed, which must be forwarded to the steering group. Another task of this group is to identify and follow-up on technical questions.
The members of the steering group and the project management group as well as their tasks and responsibilities are stated in the supplement to the contract. Besides, the communication between the two parties is regulated through the exchange of mandatory reports and minutes (Digist 2007b: 61-63; Dragsted et al. 2008: 167; Bjarke 2016: ll. 46-52).

5.5.3 THE DEFINITION OF QUALITY STANDARDS IN THE CONTRACT

Referring to Carmen (2010) quality standards are used in the contract to determine the service level and to minimize the insecurities for both parties. Carmen describes quality standards as part of the first management level in contracts, which are the prerequisite for the service outcome. Mark from municipality D confirms that the definition of quality standards is crucial part of the contract. He refers to the challenges, when it comes to define and measure quality and the implementation of the IT solution.

"Ja. Det forsøger man så vidt muligt i alle de ting man laver. I et udbud vi har kørende nu, har vi også et helt afsnit, som handler om kvalitet. Hvordan måler vi kvalitet? Hvad er kvalitet for os, hvordan vægter vi det, hvordan er det afgørende for at man vinder udbuddet eller ej? Hvad er det for kvaliteter? Og det er jo alt muligt, både i forhold til løsningsbeskrivelse, services support niveau, funktioner, alt så noget. Der mange ting, der er med til at definere kvalitet (Mark 2016: ll. 180- 184)."

S. 3.2 lists four quality factors, which a contract must cover.

- General quality factors (Indicators on how the IT solution meets the requirements of the contractor)
- Service Quality (Responsiveness of Support services; availability of the technical assistance)
- Technical related quality (Stability of the system; capability to other systems in the municipality)
- IT Security Level

The General quality factors are defined in the contractor's requirement specification, which is part of the contracts supplement (Digist 2007b: 16). In the contract supplement, the requirement specification is listed together with the provider´s proposal. Thus, the individual requirements are listed with the provider's plans on how he will comply with them:

> *"Kunden har i kravspecifikationen anført et krav lydende "XXXX"*
> *Leverandøren opfylder kundens krav delvist ved "XXYZ".*
> *Da kravet i kravspecifikationen kun opfyldes delvist, påhviler det leverandøren at ændre kravet i kravspecifikationen, således at krav i kravspecifikationen ændres til "XXYZ". Ændringen i kravspecifikationen skal tydeligt markeres, så kunden kan se, at kravet er ændret*(Dragsted et al. 2008: 713)*."*

The reservations made by the provider in the proposal are also transferred to the contract and a further discussed in the clarification phase. This project will refer to the K02 draft contract, because no valid contract between a municipality and a provider was accessible. This prevents a concrete analysis of the requirements and the provider's proposal to assess the quality standards in the contract. However, the supplement to the K02 states, which quality factors the requirement specifications normally relates to. To name some of them, there are requirements for:

- the IT support of the described work processes
- the use of different data formats
- the compatibility to the municipalities' other IT systems and the general capability of integration
- the compliancy to certain regulations in terms of IT safety
- the compliancy to the municipalities IT architecture
- the compliancy to the contractor´s standards in regards to user-friendliness, user interface etc.
- the education of the contractor's employees

This confirms the importance of the requirement specifications also in relation to securing the quality of the IT project. Also, it underlines the importance of providing a precise requirements specification formulated in a way that makes it possible to evaluate it.

The requirement specification must also include quality standards for the IT security. The K02 contract refers to IT security only in reference to the requirement specification (Digist 2007a: 20). Dragsted et al. (2008: 192) underline the importance of the contractors´ responsibility to define technical requirements for the IT security regarding IT architecture, firewalls and virus programs in

the tender documents. In the K02 supplement a differentiation between the quality standards defined in the K02 contract and the one defined in the requirement specification are made.

> *"I kravspecifikationen fastlægger kunden sine samlede behov (inkl. optioner), idet dog behovsopgørelserne for dokumentation, svartider, oppetider, vedligeholdelse, eventuel drift og anden service er indeholdt i Bilag 4-Bilag 7." (Digist 2007a: 18)*

Thus, the primary part of the contract that enables measuring the quality of the IT solution is the requirement specification. The K02 contract is built around these factors and mainly works as a supporting construct with defines further requirements for documentation, response time, support and maintenance and implementation process. The K02 contract covers mainly the following quality factors:

- Service Quality
- Technical related quality

These quality factors can then be divided into quality standards that aim at ensuring a smooth implementation and at the operation phase of the IT solution.

Quality standards aiming at the implementation are covered in the Standard contract (Digist 2007:24-31). This can be by defining deadlines, giving clear instruction regarding communication and setting successful tests of the IT solution as requirement for the contractor´s payment. These standards for the contract are more elaborated in the contract´s supplement (Digist 2007b: 6-12; 59-72; 77-83: 87-92).

The contract advises at least four tests of the IT solution in the implementation process. The provider is required to describe the plans, guidelines and the acceptance criteria for the test-runs already in his proposal (Digist 2007b: 89-92).

The quality standards which aim at ensuring a stable operation of the IT solution are listed in the contract under maintenance and support and services goals (Digist 2007a: 31-35; 55-56). The contract determines the provider to be responsible for the maintenance and support from the point the IT solutions has been successfully been implemented. In the contract and the supplement, the provider´s responsibilities for maintenance and support are described, such as updating the IT solution on a regular basis. In addition, time limits for the provider corrective actions are described in detail in the contract supplement. The contract also regulates support and maintenance services, which have to be planned by the provider to avoid interfering with the contractor´s daily operations (Mark 2016: ll. 158-163).

The contract also sets clear measurements for the service goals in the operation of the IT solution. They can be seen as quality standards, which bind the provider to a certain service level. The contract´s supplement lists three quality-categories: response time, reaction time and accessibility (Digist 2007b: Page 37). The response time is a measure of the time it takes for the IT solution to respond to a data input of the user. The reaction time is the time it takes the provider to begin the error correction, after receiving a notification of defects by the municipality. The contract´s supplement gives clear requirements for the response and reaction time. It states how these times are measured, how errors are identified and how violation of the quality standards can lead to fines. The contractor can choose different service levels. A short reaction time reflects a better support and service level, which often only can be achieved through a higher price. The purpose of the supplement-ch. is to match the expectations of both parties, when it comes to the service level in the operation of the IT solution (Digist 2007a: 34-35; Digist 2007b: 37-49).

Next to listing the requirements for both parties, the contract is a juridical guideline, when it comes to conflicts between both parties. The contract regulates and sets standards to communication and describes the consequences for the respective party if certain requirements are not fulfilled. (Digist 2007a: 44-46).

To summarize quality standards in the K02 contract, the contracts set requirements and certain quality standards for the implementation and the operations of the IT solution. Most of these are clear and offer both parties transparency in their responsibility, also when it comes to the different phases. However, it can be less clear, when it comes to the requirement specification and the degree to which the provider fulfills it. As described in s. 4.2, requirements specifications have to be accurate, so they can get verified.

5.5.4 Quality Control in the Municipalities

The second management level, the strategic level is also part of the K02 contract. As described above, the contract lists the responsibilities for both parties, gives measurements, when it comes to the reaction and response time and allows fines in case of violations on agreed terms. The contract is for both parties an assurance framework. *The second management* level enables the municipality to secure the agreed service level (Carmen 2010).

Dragsted et al. (2008:79) underlines the use of quality control criteria and measurements in the contract to increase the chances of a successful IT project. This is confirmed by Thomas, who underlines the importance of the contract in his interview, especially when it comes to secure quality.

For Thomas, the contract reflects the quality level and the provider will not deliver a better service than the one defined in the contract, rather it will be worse (Thomas 2016: ll. 264-269).

While the contract in theory fulfills the characteristics of the *second management level*, it becomes evident in the interviews, that the municipalities do not always use the contract to monitor the provider or use it as an instrument for sanctions, when it comes to the violation of certain agreements. Hence, municipalities miss a crucial instrument, which can assist municipality to secure the service level in the IT project. Mette from municipality C was made IT contract manager, because she used a contract´s instruments to sanction an IT provider, which violated the agreed terms on service quality. IT contract manager is a position, which does not exist in the other represented municipalities (Mette 2016: ll. 81-86; 384-390).

In municipality D, the IT department is responsible for the quality control of agreements with providers. Mark explains that the department could do better in this area. When the implementation of the IT solution is successful and it does not come to critical situations, the contract is rarely used to monitor the provider afterwards (Mark 2016: ll. 195-205).

Bjarke from KMD has the opinion that municipalities have become better at keeping track of the quality standards. He confirms Thomas' thesis of the provider not delivering a better service than the one defined in the contract, but he also emphasizes the provider's obligation to live up to these standards. He compares this to the situation in the past, where the provider was bound to quality standards to a lower degree. The improved contract management in the municipalities creates clear lines, which can encourage providers to be more attentive to the promised quality (Bjarke 2016: ll. 82-89).

To summarize, contract management is handled differently in the municipalities and has become generally more professional. This forces the provider to be more attentive to quality standards and deliver the service level agreed on in the contract. Contracts secure the agreed service level in the tender. Regulation and sanctions instruments allow this without a real use of them becomes necessary.

5.6 IMPLEMENTATION

As described in 4.4.3, the K02 contract sets quality standards for the implementation of IT solutions and structures the process into different phases according to the waterfall model. The activities in these phases are then defined and controlled by the information in the requirement specification and the contract (Dragsted et al. 2008:71).

In 4.4.2, the contract´s requirement for the project organizations are described. Employees from the contractor and from the provider work together in the project management and the steering group. When applying the ISF, this ensures that the specific expertise from the delivery system (municipality) and from the support system (provider) is pooled in the project organization for the implementation. The contractor supports the provider with contextual knowledge about the working processes in the municipalities, while the provider helps build up the knowledge and the capacity necessary for the effective use of the IT solution. While this in theory creates good conditions for a smooth implementation, the results of the implementation can vary depending on the efforts of both parties which confirms the importance of co-production. Bjarke emphasizes KMD´s strategy to offer change management consulting to the municipalities. This service in an increased effort of the provider to support the municipality with achieving certain goals set with the implementation of the IT solution. However, these consulting services are offered at an additional price and mostly only at the request of the municipalities (Bjarke 2016: ll. 22-37;131-143).

The sequential character of the waterfall model as well as the rigidly defined process can be a barrier for the implementation process. Changes in the implementation process have to be in accordance with the requirement specification or either documented in the change log which mostly means additional payments, which then have to be approved by the steering group. Thus, the waterfall model is characterized by inflexible processes, where the project organization often only reacts to challenges in the process. Therefore, the waterfall model´s processes are described as *managing you* rather than you managing the processes (Cobb 2015: 18-19).

The inflexibility of the waterfall model is also the reason why the model is best suited for implementing standardized IT software, which already has been tested. In the interviews with the representatives from the IT providers and municipalities, the implementation is described as a standardized process. Provider and municipality use the same project management instruments (PRINCE2[3]) to ensure a fast implementation (Mette 2016: ll. 115-116; Mark 2016: 201-205; Bjarke 2016: ll. 22-37).

Thomas from municipality B explains that the technical part of the implementation normally is unproblematic and that the human aspect of the implementation is the actual challenge, both resource and timewise. This includes explaining the functions of the IT solution to the municipality's employees and having them use it in their daily work. Expertise in change management is needed to encourage people to do things differently.

[3] PRINCE2 is a project management methodology standard. PRINCE2 offers best practice guidance on how to manage a project (Court Ruth 2006: 2).

"Den tekniske implementering er ikke den, som river til. Det er jo det at få folk til at tage skiden i brug efterfølgende og få dem forklaret, hvad er det egentlig vi har købt. Hvad er det egentlig for en serviceniveau du kan forvente, når du tager den her dims i brug? Det er, hvor hele arbejdet ligger. Du kan godt indgå en rigtig dårlig kontrakt, der gør at du skal have advokater på og alt muligt andet. Men det er stadigvæk indsatsmæssigt og ressourcemæssigt, hvor der ligger langt den største del i at få folk til at bruge det. Organisatorisk implementering. Forandringsteori, hvordan får man folk til at gøre noget anderledes (Thomas 2016: ll. 163-169)."

The importance of the human factor in the implementation process is also emphasized by Mark, who generally views the implementation process as central for the IT project´s success. When implementing a new IT solution, the end-users have to be involved in the project, they have to be motivated to use the solution and support the implementation process. According to Mark, the inclusion of the end-users is a resource intensive process. The municipality must involve them in the tender process, discuss future functions and organize courses to familiarize them with the new IT solution. It is not necessarily the price for the new IT solution, but the time and the resources to implement it that takes up the resources. This is especially the case with IT solutions in the care sector. In this sector it is especially cumbersome to implement a new solution due to the high number of users, which must be trained and because of the user´s reluctance to use IT solutions, as these are not seen as a central part of their job (Mark 2016: ll. 104-119).

The agile model used in combination with the competitive dialogue, has the ability to solve many of the implementation-challenges, which the water fall method is facing. The agile model emphasizes a partnership approach between provider and customer, but it also encourages a better dialogue in the customer´s organization by including the relevant stakeholders to give input to the development process. For example, this is ensured by building and empowering cross-functional teams, which is an important factor in the ISF framework. In municipality E, the use of the agile model began with using the competitive tender method. Stakeholders were included from the start of the project to help develop an IT solution, which is based on their needs. Cross functional teams were introduced to represent the relevant professions and the municipality's different departments in the development and implementation process. This was done to create trust to the project, but also to raise awareness on the other professions and departments challenges and needs (Cobb 2015: 26-27:30, Frederik 2016: ll. 178-194).

One way to empower the employees in municipality E and activate them further in the implementation process is through the use of implementation agents. Municipality E has 6.500 employees, which are distributed in teams of 10-40 across 7 departments. 120 of these employees are appointed as

implementation agents, which help their colleagues with using the new IT solution, when it becomes operational. Therefore, they receive special training to accomplish it (Frederik 2016: ll. 207-223).

The implementation process is managed by the central project management with Frederik as its team leader. Frederik emphasis the importance of having clear communication channels and responsibility assignments, when the IT solution *goes live*. In the interview with him, the extensive preparation for the implementation process in municipality E becomes evident. This shows the high amount of resources needed, when implementing a new IT solution (Frederik 2016: ll. 228-234).

Independent of using the waterfall model or the agile model, the implementation process is a cooperative process, which is indicated in most interviews. Bjarke even describes it as a partnership rather than a provider-customer relationship.

"(…)det er meget et partnerskab mere end det er leverandør-kundeforhold, fordi vi har begge to et ansvar for at lykkes (Bjarke 2016: ll 113-114)."

While cooperation is always essential in the projects, the character of the relationship can vary between a jobbing relations and sparring relations. This often depends on the amount of consultant services and the use of feedback to adapt the solution to the municipalities needs. When comparing the waterfall model in the tenders to the agile model in the competitive dialogue, it can be assumed that the sparring aspect is more evident in the latter model. The agile model is characterized by a continuous flow of information and by feedback circles (Cobb 2015: .23). This is not the same in the waterfall model, which normally is used for a standardized IT solution and follows a standardized process. While the implementation as provided in the waterfall model can also only function in cooperation, the model limits the extent of cooperation due to its inflexible and strict processes. This is also indicated by Frederik, who views the waterfall model as being the major course for failed IT projects as it neither gives provider nor municipality the possibility to correct mistakes in earlier phases. The fit of the IT solution to the municipalities' needs becomes only evident in course of the implementation process and this only after many resources have been invested. This forces municipalities to accept less efficient solutions, because a restart of the tender would be too cost-intensive and often also not possible (Frederik 2016: ll. 376-385).

The waterfall model is very standardized, which makes it possible to implement the IT solution in a short period and with fewer resources, because both parties know the drill. The human factors can be a barrier for a smooth implementation. Including stakeholder form the start is thereby essential in this model (Mark 2016: ll. 317-324).

However, the waterfall model is inflexible due to its sequential structure and the importance of the requirement specification in the start. This sequential process make it nearly impossible to correct mistakes in the early phases, which then can have a greater impact on the implementation process and make it more cost intensive. The agile model is more flexible in correcting mistakes, because of the feedback circles between the employees in the municipality and with the provider. Although the dialogue intensive method requires a strong project management to control the development processes and inputs, it also creates an involvement of the relevant actors which minimizes barriers in the implementation process (Dragsted et al. 2008: 67).

6 Discussion

In this ch. the three sub-hypotheses of the project are further discussed on the background of the analysis. Besides, conflicting priorities in the public IT sector, which have been a reoccurring topic in the analysis, will be further investigated to evaluate their impact on the outcome of IT projects.

These conflicting priorities are:

- Field of tension between customization and standardization
- The relation of standardization to competition and innovation

1.) The call for tender and the implementation of the IT solution are central processes, which decide if the project will be seen as successful.

The representatives of all five case municipalities and the two IT-providers emphasize the importance of the tender for the success of the IT projects. The tender process affects the project´s success. Especially the lack of communication options due to the strong regulations of the tender process is emphasized as a main challenge, because it prevents both parties from matching their expectations. The lack of communication options proves difficult for municipalities, when defining their requirement specification. This explains why the preparation and choice of the tender type are important factors for the outcome of IT projects. When applying the competitive dialogue together with the agile model, more dialogue options are available. The requirement specification can be developed together with the provider, which ensures a better match of expectations and a better fit of IT solution and the municipality´s needs.
The implementation process was also identified as important for the successful outcome. Especially the human aspect and training of the municipality's employees to use the IT solution are crucial factors.
The structuring of the analysis in the different phases of the tender and implementation process has identified several factors, which influence the outcome of IT projects. However, it can be assumed that the analyzed processes do not cover all possible factors. Internal factors in municipalities such as leadership decisions have only be analyzed peripherally, although they can determine the requirement specification and the evaluation criteria for the tender.

2.) The paradigm of co-production is essential for the tender and the implementation process. The project presumes that both provider and municipality have interest in a successful project.

The co-production is a central aspect of both tender and implementation process. IT provider and municipality have to cooperate to overcome the challenges in the course of the IT project. This includes finding ways to work around the strict regulations of the tender law or the sequential nature of the waterfall model, for example by having dialogues before the call for tender is initiated. The interviews with representatives from the municipalities and the IT providers confirm the cooperative nature of the relationship. IT providers aim at successful projects as this improves their reputation and the chances for an extension of their contracts with the municipalities. Cooperation between the two parties is also regulated in the contracts, which assigns responsibilities to both parties.

However, while the contract regulates the cooperation, it also sets a clear service level. IT providers deliver the service level, which is defined in the contract. Although both parties have an interest in a successful project, the IT provider is aware of its own resources. This becomes clear in the interview with Bjarke from KMD. If the municipality focuses on price, the IT provider will be less cooperative with its service provision and will not offer cooperative services such as change management etc. The degree of cooperation is therefore often dependent on the resources, which the municipality is able and willing to invest in the IT solution (Bjarke 2016: 131-143).
Municipality E´s IT project is based on the competitive dialogue and the agile model, which is characterized by a close cooperation, where both parties use their expertise to develop the IT solution. This development process costs more resources, both financial and personal wise, as the users of the IT solution are included in the development process next to their daily work. According to Bjarke and Frederik, only municipalities with the necessary resources at their disposal are able to choose change management or the agile model. Therefore the degree of the provider´s cooperation is linked to the sum, the municipality is able and willing to spend on the new IT solution.

3.) When making a call for tender, municipalities have to define their expectations and needs in a requirement specification, which is the basis for the IT provider to develop its IT solution.

The analysis has shown that even when the IT provider meets the requirement specifications and the municipality's expectations, this is no guarantee for a successful IT project. This contradicts the main hypothesis of the project and raises the question in which degree the requirement specification is congruent to the term *customer expectations* of the service gap concept.

In this project it is assumed that the requirement specification reflects the municipality´s need for a new IT solution and its expectations. Furthermore, it is assumed that these expectations stem from the different stakeholders, who have complemented their expectations in form of the requirement

specification. Although the requirement specification aims to reflect the expectations of the stakeholders in the municipalities, certain short-comings have been analyzed in ss. 5.1 and 5.2.

1. Employees in municipalities have difficulties formulating the needs in the requirement specifications, which can lead to imprecisions or even unrealistic requirements. So, the employees' expectations might not be comprehensible for the provider in the requirement specification.
2. The requirement specification is not necessarily the result of a process, which matches the expectations of the different stakeholders. Expectations of certain stakeholder groups are not necessarily represented in the requirement specification. For instance, the analysis indicates, that the prioritization of low-costs in IT solutions limits the influence of stakeholders (like the future users or IT experts) to form the requirement specifications in regards to their expectations.

These short-comings underline the municipality´s responsibility to channel the expectations of the stakeholders into a realistic and precise requirement specification. The main hypothesis mainly views the IT provider as being responsible for the success of the IT project. The IT provider has however to base its proposal on the municipality's expectations. Therefore, the main hypothesis has to be complemented with another hypothesis.

The more the municipality is able to formulate their requirement specification accurate and realistic, the more the IT provider is able to meet the municipalities' expectations.

While the IT provider has to meet the expectations of the municipalities as good as possible, the municipality has to define the expectations in the requirement specifications as accurate and realistically as possible.

6.1 Field of tension between Customization and Standardization

The public sector is characterized by confliction priorities between aiming for customized solutions on the one hand and standardized solutions on the other. In the empirical data, the case of municipality E can be seen as extreme case, when it comes to customization. Municipality A and D make use of standardized SKI agreements, which marks the other extreme.

The governmental interest of increasing the standardization in the public IT sector is reflected in the creation of KOMBIT and SKI. The standardization has the central aim to save resources in the public IT sector (Mette 2016: ll. 373-375). This is achieved by a centralization of tenders, so municipalities do

not need to organize their own. SKI reduces the risks, which are connected to tenders. In municipality D, the need for lawyers and expert on tender law has grown due to the complexity of tender regulation and its consequences for the success of IT projects (Mark 2016: ll. 251-254). SKI agreements can therefore help municipalities, which have not the same access to tender experts.

However, the representatives in municipality also criticize the negative consequences of the standardization. IT solutions offered by SKI, prevent municipalities from adapting it to the municipalities own working processes (Thomas 2016: ll. 393-398). The question whether IT solutions are adapted to working processes in municipalities or whether the working processes are adapted to the IT solutions describes the schism of conflicting priorities between standardization and customization (Mette 2016: ll. 367-375). Although municipalities solve the same tasks, they can have different challenges or priorities, depending on their size, spread or their IT maturity. In municipality D there was the need for an IT care solution to be accessible via smart phones. This extra requirement forced the municipality to prepare their own call for tender. The feature was highly prioritized by municipality D, but according to Mark, it is a feature that other municipalities do not prioritize (Mark 2016: ll. 86-95). It is problematic to find common agreement with other municipalities on which characteristics are the most important ones for an IT solution. This also challenges SKI, which has to prepare requirement specifications that fit to the needs of most of the municipalities (Claus and Søren 2016: ll. 118-129). Municipalities with a higher IT maturity may demand extra services or features of IT solutions, which are not relevant for smaller municipalities. These municipalities would not be willing to spend money on this kind of feature.

The question is therefore, to which degree standardized solutions can meet the expectations in the centers. Standard solutions can mostly be seen as a compromise: municipalities play it safe and save resources, instead of making their own tender. When choosing standard solutions, representatives are also willing to lower their expectations. This strategy can, however, be problematic, when it comes to the implementation. It can be assumed that the resistance of users is much higher the more the working processes have to be adapted to the IT solution (Sørensen and Torfing 2011: 852).

The question of standardization or customization is primarily also a question of resources. Mette underlines that small municipalities are less inclined to make their own call for tender and instead use SKI agreements to save resources in this area. In her opinion only a handful municipalities with a high degree of IT maturity and resources would invest in the change management or the agile model (Mette 2016: ll. 251-254; 344-351). A middle-ground between SKI-agreements and making the own tenders is the strategy of municipalities to work together when making a call for tender. The cooperation can distribute the use of resources needed for making a tender between the participating municipalities.

6.2 Innovation and Competition

The field of tension between standardization and customization is also closely linked to other governmental digitalization goals for the public IT sector: The increase of competition in the public IT sector and the increased use of innovative solutions. Yet, standardization can represent a barrier for these two.

For Frederik standardization favors one way of solving challenges. Through the use of SKI agreements, municipalities do not deal with defining needs or searching for new solutions. This gives providers less incentives to find new ways of solving challenges, when standard solutions are sufficient. The use of existing IT solutions as part of the SKI agreements does not contribute to new thinking in the sector (Frederik 2016: ll. 92-98).If a municipality wants to acquire a more innovative product, it must prepare its own call for tender.

Besides, if a SKI agreement is chosen, the innovative effect of the new IT solution is postponed. The decision in municipality A to postpone changing the IT solution is also due to transaction costs. Training a high amount of users has to be planned beforehand and costs resources, as the municipality must coordinate the daily tasks and the training of the employees.

As raised in the interviews, the fact that KMD slowly reacts to the competition on the market is also due to the SKI agreements. SKI can postpone the diffusion of new solutions on the public IT sector and thereby pose a barrier for competition. Companies who are part of a SKI agreement have a decisive advantage over companies, which do not have such an agreement (Frederik 2016: ll. 114-115; Claus and Søren 2016: ll. 240-241; 313-318).

7 CONCLUSION

The project has identified several factors, which influence the success of IT projects. Notably the requirement specification impacts the outcome of IT projects and can cause IT projects to fail. A realistic and precise requirement specification that covers the needs of the municipalities is the foundation for a successful project.

Defining a fitting requirement specification is, however, a challenging process, which relies on several success factors to be present. Next to the municipality's responsibility to screen the market and be aware about existing IT solutions and technologies, the municipality has to have internal communication channels which:

- Collect information on the expectations that relevant stakeholder (end-users, IT experts, leaders) have for the IT solution
- Balance the expectations of its stakeholders and filter the central needs
- Coordinate the expert, juridical and technical knowledge to define the requirement specification

The expectations for the IT solution also must be balanced with the resources that the municipality is willing and able to invest. Evaluation criteria and especially the focus on the price can affect the quality of IT solutions and the perception of it negatively.
Beside the internal communication in municipalities, the lack of communication options with the provider in the standard tender process is the main hindrance for formulating a realistic and precise requirement specification.
In order to minimize the risks of unsuccessful IT projects due to the tender regulations, municipalities choose SKI agreements, where SKI has developed the requirement specification on behalf of municipalities. Hence, choosing standard solutions offered by IT providers via SKI do not make it necessary for municipalities to make their own requirement specification.
Via SKI municipalities have access to the content of the provider´s proposal, before they purchase the IT solution. Therefore, the use of SKI agreements rather leads to an adaptation of the municipality's expectations to the IT solution, than an adaption of the IT solution to the municipality´s expectations. This may hinder innovation in the public IT sector.
The use of competitive dialogue is used when the municipality aims for a customized solution. It also changes the process of a standard tender and gives providers and the municipality more dialogue options. The requirement specification is developed in a cooperative process, which make it easier for both parties to match expectations. Systematic's IT project in municipal E is an example of a successful

IT project. The development and implementation process is characterized by several quality factors identified in the ch. 2, which do not characterize the normal tender process. Together with the competitive dialogue the agile model secures:

- A high communication frequency
- A strong bi-directional communication
- Design quality of the IT system
- Delivery quality, as the support for the implementation

These factors result in an overall communication quality and a better relationship quality between both parties. This reduces the service gap and the IT project is perceived as successful.
With SKI and the competitive dialogue/agile model, the municipalities have alternative risk-aversive strategies to formulate a requirement specification. In these cases municipalities either pass the responsibility to an organization such as SKI or they develop it together with the IT provider in order to improve it.
Regulations of the standard tender that limits *communication frequency* and the *bi-directional communication* can increase the service gap between the municipalities´ expectations and the IT provider´s delivered solution. Although there are instruments such as the use of reservations or the clarification phase in the contract that may be used to clarify misunderstandings, their effect is only limited as major changes to the requirement specifications are not possible due to the tender regulations. Also, contracts identified as being central for ensuring the quality level in the IT projects, they do not guarantee the project's success, when the requirement specification was not well prepared. A change of tender regulation to allow more dialogue options and flexibility to edit the requirement specification in course of the project is needed in order to reduce the risks for failed IT projects.

The use of the tender type also affects the implementation process. The waterfall model of the standard tender does not support adaptions and new developments in the same way as the agile model. The ISF underlines that adaptions are important for the success of the IT solution, because future users have to be motivated to use it. The waterfall model is less suited for including all the stakeholders and their *practice-based* knowledge in the development process. Hence, working processes are often adapted to the IT solution, which then creates more resistance among the future users. The agile model empowers its users and includes their feedback in the development, so the IT solution is adapted to the working processes, thus, overcoming central implantation barriers.
However, only resourceful municipalities can use the agile model. Municipal E is an example. Although it faces the same challenges as the other case municipalities, the access to more resources make it easier for the municipality E to use strategies such as the agile method to overcome these challenges

and to improve the chances of a successful IT project.

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9 APPENDICES

9.1 – Internal Document – Muncipality E

9.2 – Interview with Cecilie and Marie from Muncipality A

9.3 – Interview with Thomas from Muncipality B

9.4 – Interview with Mette from Muncipality C

9.5 – Interview with Mark from Muncipality D

9.6 – Interview with Frederik from Muncipality E

9.7 – Interview with Bjarke from KMD

9.8 – Interview with Emil from Systematic

9.9 – Interview with Claus and Søren from SKI