



LUND UNIVERSITY
School of Economics and Management
Department of Informatics

The use of BI software in Swedish municipalities

The path municipalities take from adopting BI to actual use of BI

Master thesis 15 HEC, course INFM10 in Information Systems
Presented in June, 2016

Authors: Tobias Andersson
Hafidz Alhaq Fatih

Supervisor: Miranda Kajtazi

Examiners: Odd Steen
Paul Pierce

The use of BI software in Swedish municipalities: The path municipalities take from adopting BI to actual use of BI

Authors: Tobias Andersson and Hafidz Alhaq Fatih

Publisher: Dept. of Informatics, Lund University School of Economics and Management.

Document: Master Thesis

Number of pages: 103

Keywords: Business Intelligence, Municipalities, Path, Value, Actual Use

Abstract (Max. 200 words):

Business Intelligence has been growing fast the last two decades and more organizations are seeing a need of BI software to analyse data and make fast and accurate decisions. Public sector and municipalities have also adapted to this trend and implemented BI in their organizations. It is claimed that public sector tends to be slower and more resistant when adapting new technology. The purpose of this study is to evaluate the path Swedish municipalities take from adopting BI to actual use of BI and to show where it adds value in a municipality. The results show that all Swedish municipalities have BI software in place and the adopting process is slower because of laws and regulations delaying the procurement process. Once the software is in place, the value added is quite similar to the private sector. Though it is clear that most value is added to HR (Human Resource) and finance, and there is also a pattern of need in elderly care and school. Findings also show that Swedish municipalities have had BI for quite a long time already and Swedish municipalities are exceptionally good at BI compared to other countries.

Content

1	Introduction.....	1
1.1	Background.....	1
1.2	Problem.....	2
1.3	Purpose	3
1.4	Delimitation	3
2	Literature Review.....	4
2.1	The municipality’s role in society	4
2.2	The use of IT in municipalities.....	5
2.2.1	Evolution of e-government.....	5
2.2.2	Sectors of e-government.....	6
2.2.3	Adoption of e-government in municipalities	8
2.3	Business Intelligence industry	9
2.3.1	Vendors and consultants.....	9
2.3.2	Conditions for BI success.....	10
2.3.3	Adoption of BI in governments.....	11
2.4	Acceptance of Information Technology	12
2.4.1	Technology Acceptance Model.....	13
2.5	Theoretical framework	14
3	Methodology	16
3.1	Qualitative method	16
3.2	Data collection.....	16
3.2.1	Collection techniques	17
3.2.2	Structuring the interview guides	17
3.2.3	Informant selection.....	21
3.2.4	Interviewing	22
3.3	Data analysis.....	22
3.4	Research quality	23
3.4.1	Reliability and validity	23
3.4.2	Bias.....	24
3.4.3	Ethics.....	25
4	Empirical findings.....	26
4.1	Respondent profiles	26
4.2	BI-experts’ perspective.....	28

4.2.1	The value of BI in municipalities	28
4.2.2	Challenges of working with municipalities.....	30
4.2.3	Advantages of Swedish municipalities	32
4.2.4	Future use of BI in municipalities	33
4.3	BI-administrators' perspective	33
4.3.1	The municipality of Kävlinge	34
4.3.2	The municipality of Lund.....	35
4.3.3	The municipality of Jönköping	38
5	Analysis and discussion	41
5.1	Adopting BI in a municipality	41
5.2	Actual use of BI in a municipality	43
5.3	Future use if BI in municipalities	46
6	Conclusion	47
6.1	Further research	48
Appendix 1 - Interview guide (BI-expert).....		49
Appendix 2 - Interview guide (BI-administrator)		50
Appendix 3 - Interview transcript Qlik		51
Appendix 4 - Interview transcript Acando		60
Appendix 5 - Interview transcript Hypergene.....		67
Appendix 6 - Interview transcript Kävlinge kommun		74
Appendix 7 - Interview transcript Lunds kommun		81
Appendix 8 - Interview transcript Jönköpings kommun.....		88
References		94

Figures

Figure 2.1: Municipality's responsibilities	4
Figure 2.2: Magic Quadrant for Business Intelligence and Analytics Platforms.....	10
Figure 2.3: Technology Acceptance Model	13
Figure 2.4: Theoretical framework.....	15

Tables

Table 3.1: Topic relation to interview guide 1	18
Table 3.2: Topic relation to interview guide 2	20
Table 3.3: Transcript process	22
Table 4.1: BI-experts	26
Table 4.2: BI-administrators	27

1 Introduction

This chapter of our thesis presents a background to provide insights about the research elements of inquiry. The chapter also defines the problem area which the research question is based upon, with motives and explanations. Delimitations are also brought up in this chapter, to show the main intentions of the thesis.

1.1 Background

Chaudhuri et al. (2011) describe Business Intelligence (BI) software as “a collection of decision support technologies for the enterprise aimed at enabling knowledge workers such as executives, managers, and analysts to make better and faster decisions”. It is stated that the past two decades have had a huge growth, both in terms of the offered products and services, but also in the adoption of these technologies. Isik et al. (2011) have done a survey on BI satisfaction in organizations which shows that almost 70% of all respondents are satisfied or strongly satisfied with their BI solution. These numbers indicate that BI software has not only grown, but also has a huge potential of adding value to organizations.

An implementation of BI software comes with both opportunities and challenges though. Gangadharan and Swami (2004) explain that implementing BI demands an organization to fully know what BI is, why you need it and the benefits it will provide for your organization. It also requires a smooth transition to integrate the implementation to the existing enterprise, making all users to understand its potential (Ibid.).

Governments are an example of organizations that have adapted the capabilities of IT, which has resulted in the term e-government. This is defined by Chun et al. (2010) as the electronic interaction between governments with citizens, businesses, employees and other government agencies. IT has become a crucial part here to increase performance and improve processes related to the responsibilities of a government.

Chun et al. (2010) explain the evolution of e-government as a process of modernization from paper-based tasks and processes to digital ones. This includes fast, automated and convenient access to government information and services. Making tasks and processes digital have promoted the dialogue with citizens and also the collaborative decision making by including the public in the politics.

E-government also includes municipalities, which today are using IT on a daily basis. The role of a municipality is to govern on a local level, with responsibilities of for instance child-care and education (SkI.se, 2016C). In line with the growth of BI, municipalities have also adapted this technology to support their decision making and data analysing. An issue that comes with adopting technology is the acceptance of new technology, which according to Davis et al. (1989) can be very complex. This leads to our problem area, which is to explore

the path that municipalities take from adopting BI to the actual use of BI, and to explore where in the organization it adds value.

1.2 Problem

As mentioned before, a BI implementation comes with both opportunities and challenges. Pettey and Van Der Meulen (2008) explain that many organizations are experiencing issues when connecting BI with the business and have troubles with getting users fully involved in this shift. It is said that one mistake can ruin the whole implementation and the biggest risks are related to non-technology issues.

One of these non-technology issues is the users not fully knowing the value of a BI implementation. Bringing BI into an organization, brings value growth in terms of managing the data automatically and doing analysis of the data. By not knowing why BI should be used, nor how it is used, there will be no advantage of implementing it (Ibid.). BI vendors and consultants are the experts in this industry, who know the different tools that are available and the value a solution can add to an organization (Gibson et al., 2004). It is their task to customize the BI software in a proper way at their customer's site.

In the case of a government, it becomes even more problematic to adopt new technology. Cherkis (2013) explains that governments face more complex situations as they have a big number of employees and regulatory requirements, which makes it tedious to start the procedures of adopting new technologies, a reason that partly explains why they remain resistant to new technology. Governments also tend to be slow and resistant since they are less competitive compared to organizations in the private sector (West and Lu, 2009).

Independent of this resistance, governments are right now in the era of looking for new technologies and approaches to assist their work (Cherkis, 2013). The problem area of our research is connected to earlier mentioned challenges of a BI implementation and is applied on a governmental level. In our thesis, we evaluate where municipalities add value from the use of business intelligence software in Swedish municipalities by understanding the path they take from adopting BI to the actual use of it.

Our focus on the path municipalities take to adopt BI starts from the moment they adopt a BI technology to the actual use of it. We do so, because we believe this part of the whole path (from development to the users) is fairly important but vaguely covered in the literature. Understanding this particular path (from adoption to actual use), we can illustrate how successful and crucial a BI implementation is for a governmental institution like a Swedish municipality and what issues and hardships they commonly experience during this path.

The problem area results in the following research questions:

- 1) *What path do Swedish municipalities take from adopting BI to actual use of BI?*
- 2) *Where does BI software add value to municipalities in Sweden?*

1.3 Purpose

The purpose of this study is to illustrate the path Swedish municipalities take from adopting BI to actual use of BI and to explore where the software adds value. This is done by conducting interviews with both BI-experts and BI-administrators in municipalities in Sweden. With these empirical findings, we analyse and compare two different angles of the path. The contribution to the research field of information systems is to show how municipalities approach BI software, how crucial it is for a municipality and what challenges they face. This area is quite unexplored and this thesis add insights both in the area of BI and the use of IT in a governmental organization which a municipality is. The intended audience is therefore both the stakeholders in the BI industry, but also all governmental organizations.

1.4 Delimitation

This study does not evaluate the whole path of BI implementation, but is rather delimited to the path that municipalities take from adopting BI to actual use of BI. It also shows where in a municipal organization the software adds value. The thesis is also delimited to Swedish municipalities and BI experts that are operating in Sweden. Sweden is chosen because of the fact that the country is known to be good at exploiting the opportunities offered by ICT (Dutta et al. 2015). This study does not examine other level of organization in the democratic system, even though we believe the collected findings are important for all governmental organizations. Finally, there is also a focus on the actual use of BI software in municipalities which are delimited to the three municipalities we approached: the municipalities of Kävlinge, Lund, and Jönköping.

2 Literature Review

This chapter of the thesis is explaining the theory and relevant knowledge behind our research. It starts with an explanation of the role of municipalities in society. From there, we narrow this by explaining the use and adoption of IT at a municipality and the BI industry. We also discuss a technology acceptance model. The literature review ends with a theoretical framework which our research is based on.

2.1 The municipality's role in society

A municipality is described by Ferris (2010) as “the most immediate interface between a government and its citizens”. The Swedish Association of Local Authorities and Regions describes the democratic system (Skl.se, 2016B). Sweden has three democratic levels, which are local, regional and national level. There is one parliament on the national level, 20 county councils on regional level and 290 municipalities on local level. Every fourth year, there is an election for each one of these three. Regarding municipalities and county councils, you can only vote in the area you are a resident of (Ibid).

Regeringskansliet (2015) bring up some of the main objectives for a municipality. The municipal level is determined by a constitution, which are saying that municipalities should ensure local welfare and interests. To do this they have the right to levy taxes from the citizens. Voluntary activities and compulsory activities are also stated by law, which are all decided on national level.

Furthermore, Skl.se (2016C) describes more in detail about the role of municipalities in society. It is explained that municipalities are responsible for all childcare, primary education and secondary education. Elderly care and care of disabled people are also important responsibilities. Water supply, waste disposal, spatial planning and rescue service are also mentioned. Ferris (2010) also explain that municipal authorities are responsible for managing the budgets for these services.

Based on the responsibilities described by Skl.se (2016C), a figure has been created to simplify the most crucial tasks for a municipality (Figure 2.2).

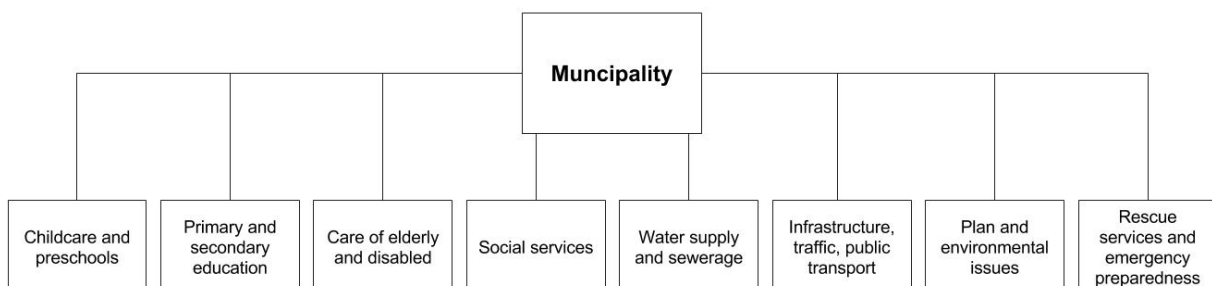


Figure 2.1: Municipality's responsibilities (Skl.se, 2016C)

2.2 The use of IT in municipalities

Information technology (IT) has become a critical resource in today's businesses (Chun et al., 2010). It has been quite some time since the role of IT became an integrated part of people's daily life. In the field of management, IT provides many possibilities to improve internal managerial efficiency and effectiveness. This has led to organizations embracing IT as an important factor and this also includes governments and municipalities (Ibid.).

Zeb et al. (2012) explain how municipalities have increasingly started to rely on computer-based systems and data management. IT is being used for planning and scheduling, design, finance and accounting, management, and monitoring processes. It is also stated that municipalities use a range of software in each process category, both to cooperate between municipalities and within municipalities.

Furthermore, Zeb et al. (2012) emphasize the potential in improving information exchange such as template based communication or automated computer-to-computer communication. It is said that the efficiency could improve in terms of time. Effectiveness regarding quality and cost could also be better. With quality, they refer to the capability of delivering the right information to the right person at the right time.

2.2.1 Evolution of e-government

Chun et al. (2010) explain that the change of interaction from conventional government to the IT-incorporating government gave birth to the term of digital government or electronic government (e-government). E-government is applicable on all levels of a government, which includes the municipal level (Moon, 2002). According to Bekkers and Hornsburg (2005), e-government supports and redefines existing and new information, communication and transaction-related interactions with stakeholders through IT. The main goal is to improve government performance and processes, which is done by using the internet.

Moreover, Bower and Christensen (1995) divide the evolution of e-government into four stages. The first stage is called digitization of government information. This stage is mainly about the early presence of government to people with simple informational web sites so that citizens can gain knowledge of what the government do. The nature of this stage is passive which means the interaction between government and citizens is one-way.

The second stage of this evolution is when government starts providing interaction with citizens through an electronic platform (Ibid.). In this stage, the interaction is still basic such as citizens' complaints and question-answer between government and citizens. Thus, main medias used here are email and web-based interactive forms. The third stage is when government provides online transaction services such as permit application, tax payments, etc. The last stage provides governance sharing to transform governmental operations. The operations include seamless information flow and collaborative decision making. These stages are in line with what Seifert (2003) has summarized in his paper where he named all four stages respectively as presence, interaction, transaction, and transformation.

Chun, et al. (2010) then emphasize the first three stages as Government 1.0 and the last stage as Government 2.0. The difference between these two terms is that the first one focuses on modernization of the public sector from conventional paper-based tasks and processes to digi-

tal ones, while the second term can only be achieved when there is a meaningful dialogue between the government and the citizens as well as among citizens themselves. Looking deeper into Government 1.0, it is generally accepted that this form of government is already implemented widely across the globe.

Meanwhile, Government 2.0 is the new standard of governance that, even though it has already been implemented by some, is still on its way to be embraced globally. What makes Government 2.0 being on a whole different level is that it requires information to not only flow one-way from government to citizens, but also the other way around and among the citizens themselves so that citizens' voices can be heard and reflected into public policies. In order to realize this transformation, extensive technological support for citizen participation is needed. This will, in turn, produce collaborative decision making processes in establishing new government policies. (Chun, et al., 2010)

2.2.2 Sectors of e-government

The division of e-government is probably one of the most debatable topic within the discussion of e-government. Although most authors have the same understanding upon dividing e-government based on the actors involved, the result still varies. For example, Seifert (2003) identifies three sectors of e-government which are usually known as abbreviations: G2G (government-to-government), G2B (government-to-business), and G2C (government-to-citizen).

Meanwhile, Fang (2002) proposes eight sectors of e-government, including the aforementioned three plus citizen-to-government (C2G), business-to-government (B2G), government-to-nonprofit (G2N), nonprofit-to-government (N2G), and government-to-employee (G2E). This literature review explains the former division since it has already included all of Fang's division. Seifert (2003) emphasizes that even though some authors include G2E (government-to-employee) as another sector, its operations are all about intra-agency activities, thus G2E can be considered a part of G2G.

- Government-to-government (G2G)

G2G is considered as the backbone of e-government. It is so crucial that some observers suggest governments to build their internal systems before further electronic transaction with external entities such as citizens and enterprises can be successful (Atkinson & Ulevich, 2000). The range of activities of G2G involves both intra-agency and inter-agency activities at any governmental level, including national, state, and local or municipal level (Seifert, 2003). This can be done by enabling data sharing and conducting electronic exchanges between the actors involved (Ibid.).

Seifert (2003) further mentions three underlying motivations of G2G initiatives: legislation, improved efficiency, and trends. The first motivation is formal and mandatory in nature. Seifert (2003) emphasizes that there has been a lot of laws and regulations that encourage the implementation of e-government. One of the example is how the Paperwork Reduction Act (PRA) can not only reduce the information collection and reporting requirements of federal government in USA but also promote information management activities in the same time (Relyea, 2000). As a result, all services and transactions of federal government of USA were ordered to be put online by 2003 (Trattner, 2000).

As the second motivation to the G2G initiative, efficiency might be the most widely perceived benefit to implement IT. Especially within governmental environments, even before the appearance of the internet in late 1980s, governments were already implementing IT to improve operating efficiency (Tat-Kei Ho, 2002). Furthermore, Fang (2002) adds effectiveness alongside efficiency and argues that both result in positive impact with the presence of G2G. This happens due to general impacts of IT such as increasing the speed of transactions, reducing the number of personnel to finish a task, and improving the consistency of outcome (Seifert, 2003).

Finally, the last thing to drive G2G initiative is that the attention of improvement caused by IT keeps growing. Such a trend comes with the emergence of IT implementation from other areas of both public and private sectors. Especially in public sector, state and local governments are often perceived as models for e-government initiatives since they not only have a central role in delivering services to citizens, but also have tight proximity to citizens. For example, the overhaul of Federal Aviation Administration (FAA) and Internal Revenue Service (IRS) systems have shown how important a good IT management is to help these projects achieve success. (Seifert, 2003)

- Government-to-business (G2B)

Due to the high enthusiasm of business sector and the potential to reduce costs through improvements in procurement practices and competitions, G2B gains a significant amount of attention (Gilbert in Seifert, 2003). Fang (2002) describes the characteristics of G2B based on three aspects, namely information, communication, and transaction. Information involved in G2B is the likes of taxes, business licenses, business policies, administrative responsibilities, etc. In terms of communication, G2B tends to incorporate information requests and discussions regarding administrative processes for businesses or communication with politicians (Fang, 2002). Lastly, the transaction of G2B usually includes online delivery of service and posting of results such as e-auditing, e-procurement, and e-shopping (Fang, 2002).

According to Seifert (2003), there are two primary motivations that push G2B sector forward. The first one is business community who successfully use electronic means replacing conventional methods in many activities like procurement, sales, and recruitment (Seifert, 2003). For instance, in 2000, Covisint was built to provide online environment for automakers and part suppliers to buy and sell goods, share information, and collaborate on new products (Seifert, 2003). This kind of success inspires governments to adopt similar approach to do transactions with the business community.

The second driving force that motivates G2B to grow is the fact that policy makers keep demanding for cost cutting and more efficient procurement (Seifert, 2003). This motivation has similarity with the motivation of G2G initiatives at some point where e-government is embraced as a result of demand for efficiency. Additionally, Seifert (2003) emphasizes that many G2B initiatives are focused to both streamline and improve the consistency of personnel-intensive tasks such as license renewals.

- Government-to-citizen (G2C)

Out of six types of digital government initiatives outlined by Pardo (2000), four of them are concerning G2C relationship: citizen access to government information, facilitating general compliance, citizen access to personal benefits, and citizen participation. This finding could

act as one argument showing how crucial G2C initiatives are. Seifert (2003) also argues that G2C is widely perceived as the main goal of e-government. Some forms of G2C initiatives are licenses and certificate registrations, tax payments, electronic voting, etc. (Fang, 2002). The big goal of implementing such initiatives is to create a “one-stop shopping” site where citizens can solve various tasks, especially those that involve multiple agencies, without asking citizens to make contacts with each agency one-by-one (Seifert, 2003).

Seifert (2003) argues that there are two motivations driving the interest in G2C initiatives. The first one is the demand of the citizens themselves, especially from the young audiences since they are used to work with personal computers and the internet in many activities (Seifert, 2003). Even though the article was published in 2003, this factor is proven to be relevant these days due to the ubiquity of electronic gadgets and the internet. Seifert (2003) also emphasizes that citizen demand can also be caused by increased time pressures. This means that as the citizens get busier and the growth of citizens increases, they may look for alternatives to increase efficiency in their life. For example, instead of waiting in line for hours to apply for administrative needs, online application will be much faster. Secondly, Seifert (2003) states improved efficiency as another underlying motivation to the emergence of G2C initiatives, which is similar to G2G and G2B as explained before.

2.2.3 Adoption of e-government in municipalities

As mentioned before, e-government has been adopted on a local level at municipalities, yet Moon (2002) claims there is still much to learn and the adoption is still at an early stage. In his article, he provides some interesting insights about how different factors affect the use of IT in municipalities.

Moon (2002) claims that size and type of government are significant factors when implementing and developing e-government. This applies on all levels of governments. It is said that larger governments are more proactive and strategic in advancing e-government, while council-manager governments pursue e-government more actively than mayor-council governments. Council-manager government and mayor-council government are the two forms of local government in the United States, which have the characteristics of a municipal government.

Except the size and type of government, there are other contributing factors to why IT is adopted to different extents in municipalities. Lack of technical knowledge, personnel and financial capacities are also major barriers to the development of e-government in municipalities according to Moon (2002). These facts are applicable to Swedish municipalities, which according to Skl.se (2016A) vary a lot in size and personnel.

Furthermore, Moon (2002) states that municipalities are either in stage one or stage two of e-government, which refers to the earlier mentioned explanations of Government 1.0 and Government 2.0. This places them in Government 1.0, which means that they either just publish government information over the web or provide channels for two-way communication. It is also said that the current state of e-government in municipalities is much undeveloped even though the adoption rate for Web sites is high. When this article was written, only 8 % of the municipalities had a strategic plan for an e-government initiative.

In addition, the findings from the study by Moon (2002) also indicates that e-government has not been as effective as the potential the world suggests. City managers are saying that e-government has defined changes in their work, but Moon (2002) has the reason to believe that e-government can result in more contributions to cost savings, revenue generating and downsizing for municipalities. This is explained to be a result of a mild encouragement from municipalities to the potential of technologies.

A mild encouragement from municipalities leads us to the managerial innovation orientation, which is described in another article by Moon and Norris (2005). In this research, they find a link between a culture of innovation and the development of e-government. It is said that municipalities that implement managerial innovations actively will more likely have a strong innovation culture, making it easier to adopt e-government initiatives with less administrative resistance. In other words, a culture that is more open to change will more likely adapt value of innovations, such as e-government.

Even though Moon (2002) is critical to municipalities' adoption of e-government, he proposes an optimistic future. He argues that municipalities will be required to do more technical, personnel and financial commitments in order to achieve more value from e-government. Moreover, he suggests municipal governments to establish systematic and comprehensive e-government plans to work towards the desired goals.

2.3 Business Intelligence industry

When the amount of data was increasing in the 1990s, the term Business Intelligence (BI) was coined by Gartner Group with an aim to better analyse data, respond to customers faster and improve the decision making in organizations (Isik et al., 2011). Gartner is the world's leading company in information technology research, providing insights and analysis within their field (Gartner, 2016). In the field of BI and analytics, they work with a magic quadrant of all vendors which is discussed in the next section.

Furthermore, Isik et al. (2011) explain that BI can be both technical and organizational elements that present information with the goal to improve decision making and management support. It is technical in terms of using a software and organizational in the way that the overall purpose is to increase organizational performance by effective analysis and decision making. Today's organizations collect big amounts of data and the BI software make sense of all the data by collecting, gathering and analysing the information. It is a question about adding business value and improve the competitive advantage by making fast and accurate decisions in the organization (Ibid.).

More value from BI is explained by Watson and Wixom (2007). They explain that BI reduces the IT infrastructure cost when all the redundant and duplicated data is being eliminated. Moreover, it also saves you time by having data delivered more efficiently. You can access the data you want immediately and analyse it as it happens. The data is also easier to measure.

2.3.1 Vendors and consultants

Gibson et al. (2004) explain that business intelligence is driven by the software vendors and consultants. These two stakeholders are the main actors when adding value to an organization

that is the customer and end-users of the software. Some companies are both vendors of their software and consultants, and others work independently as consultants or vendors and are instead partners with each other.

A good example of a vendor is Qlik, which is a Swedish company with over 1700 partners around the world (Qlik, 2016A). In these cases, consultant companies become an intermediary between customers and the vendors, which allow them to become experts in a certain tool and/or industry.

In figure 2.2, the magic quadrant by Gartner Group is illustrated. Here you can see the most relevant BI vendors of today and how they compete with each other (Parenteau et al., 2016). The quadrant is divided into challengers, leaders, niche players and visionaries. In the analysis by Parenteau et al. (2016), strengths and weaknesses with each vendor is discussed to bring motives of why the vendors are placed where they are. This quadrant is often used by consultants to adapt to trends in the market.



Figure 2.2: Magic Quadrant for Business Intelligence and Analytics Platforms (Parenteau et al., 2016)

2.3.2 Conditions for BI success

According to Watson and Wixom (2007), there are certain conditions that favour the BI-implementation to be successful. Firstly, senior management has to believe in BI and encourage the use of BI. If it is not driven from the top by having a positive vision for BI, the implementation will certainly not succeed.

Secondly, information and analysis must be a part of the culture within the organization. Watson and Wixom (2007) compare this with making decisions on intuition and highlights that it can be problematic to move from this way of decision making. It might also demand new people to be involved in the decision making. Furthermore, Watson and Wixom (2007) emphasize the alignment between business and BI strategies. The BI solution can only be valuable for the business strategy when there exists an alignment.

The last conditions described are an effective BI governance and a strong data infrastructure for decisions. All actors in the organization must be placed correctly to support BI and the data must be characterized by high-quality. The actors will not accept, nor use data they do not trust and rely on. Lack of high-quality data is also stated as the most common reason of BI failure according to Watson and Wixom (2007).

Furthermore, Pettey and Van Der Meulen (2008) are discussing common flaws when implementing BI software in an organization. One of the most common mistake is to believe a BI initiative is only technical. As mentioned before, the goal is to increase organizational performance by effective analysis and decision making (Isik et al., 2011). The suggestion by Pettey and Van Der Meulen (2008) is therefore to establish a BI competency centre to drive the adoption of the BI initiative to gather all the skills that are required.

Another flaw is organizations being too locked into the “excel culture”, where data is extracted from internal systems and loaded into spreadsheets which are not shared among the whole organization (Ibid.). The BI initiative should therefore seek to be more transparent and cut through these barriers by changing the culture at the workplace.

Finally, Pettey and Van Der Meulen (2008) claim that the biggest mistake one can do is to not have a documented BI strategy. This goes hand in hand with the suggestion by Watson and Wixom (2007) to have an alignment between business and BI strategies. If you do not have a clear strategy documented, the implementation will end up adding very little value, causing a siloed solution that is not used to its full potential (Pettey and Van Der Meulen, 2008). Once again, the suggestion here is to have a team that are responsible for the strategy and will work as a BI competency centre.

2.3.3 Adoption of BI in governments

There is yet not much said about BI implementations in governments, but Chen et al. (2012) describe how business intelligence and analytics can leverage opportunities for e-government and politics. It is explained that the first signs of success were seen from online campaigning and political participation in 2008. Politicians used web platforms for discussions regarding policy questions, advertising, event announcements and donations.

Furthermore, Chen et al. (2012) claim that since governments and the political processes are becoming more transparent, there are great opportunities for adapting BI research in applications for e-government and politics. Some of the benefits mentioned for politics are selected opinion mining, e-democracy, political blogs, forums analysis, e-government service delivery, process transparency and accountability, and finally social network analysis. Regarding e-government applications, it is said that the value could be semantic information directory and ontological development to better serve their target group, which are the citizens (Ibid.).

A demonstration of the ontological development for e-government is brought up by Yang and Callan (2009). They describe a software that can be used by governments to interactively organize and summarize online public comments from citizens. It is stated that this type of analysis is valuable because of the capability to analyse information quickly and efficiently within the organization, rather than outside where the same expertise may not exist (Ibid.).

Another example is also brought up by Karpf (2009), who describes the growth of political blogosphere in the United States. This way of creating dialogue with citizens, using the internet as the instrument is called e-participation (Stieglitz et al., 2012). Stieglitz et al. (2012) believe there are great benefits in increasing the amount of e-participation and actively engage in social media, monitoring and analysing all of its context. This is of course also applicable on political blogosphere.

Riad et al. (2010) propose a framework of how to integrate decision support in governments. It is said that progress of new technologies should be considered and applied in e-government. The suggestion is therefore to add and integrate a decision support system with the managerial levels of the e-government. As it looks today, top managers need to make fast and accurate decisions in e-government according to Riad et al. (2010) and BI software will aid them with this.

Making fast and accurate decisions are related to the ability of visualizing data. Savoska et al. (2008) did a survey on data visualization in a local municipality in Republic of Macedonia, which shows the importance of local government managers needing to visualize data in order to do analysis and making decisions. It is said that a data warehouse is needed to compile different data sources, and managers are then trained for proper use of the software to create reports and visualizations from the warehouse. However, it is once again mentioned that more professional tools for visualization is needed and a shift towards a greater use of BI is identified.

To sum it up, there is great potential for BI software in governments and it is a field that is quite unexplored. Chen et al. (2012) illustrate its benefits in both governments and political processes as a way to interact with citizens using web platforms and analysing the content of public comments. However, there is no theory about governments and their employees using BI software in their daily work. There is also nothing said about the use of BI in Swedish municipalities, which leads us to our theoretical framework described in the next section.

2.4 Acceptance of Information Technology

Information technology has been developing immensely in today's organizations across the globe. The obvious reason to this is its ability to improve organizational performance (Davis et al., 1989). However, the resistance to embrace IT by managers or professionals has been a widespread problem (Davis et al., 1989). That is why it is important to understand the underlying reasons of why some people accept IT while others reject it. Furthermore, Swanson (1988) emphasizes this study as one of the most challenging issues in information systems research.

Since research in information systems is relatively new compared to other more established field of social studies, early IS researchers suggested to use intention models from psychology

field which has main focus on human behaviours (Watson, 1913). Fishbein and Ajzen's (1975) propose a Theory of Reasoned Action (TRA) which was the recommended model to predict and explain behaviour across wide variety of domain. However, due to its generality, Fred D. Davis (1986) then adapt TRA to formulate the Technology Acceptance Model (TAM) which specifically addresses behaviours related to the use of IT (Davis et al., 1989).

2.4.1 Technology Acceptance Model

In 1986, the technology acceptance model was proposed for empirically testing new end-users use of information systems (Davis, 1986). TAM aims to provide an explanation of the general determinants of technology acceptance, explaining the user behaviour across a wide range of computing technologies and user populations. Davis (1986) explains that it can be used both for prediction and explanation, which means that you can easily identify why an information system may not be accepted and how you correct this.

In figure 2.3, you can see an illustration of TAM. Davis et al. (1989) explain that the model includes two particular beliefs: perceived usefulness and perceived ease of use. These are explained as the primary factors for computer acceptance behaviours. With perceived usefulness, it refers to the end-user's subjective probability that using a specific information system will increase his or her job performance within an organizational context (Davis et al., 1989). Moreover, perceived ease of use is to the degree to which the prospective user expects the information system to be free of effort (Ibid.).

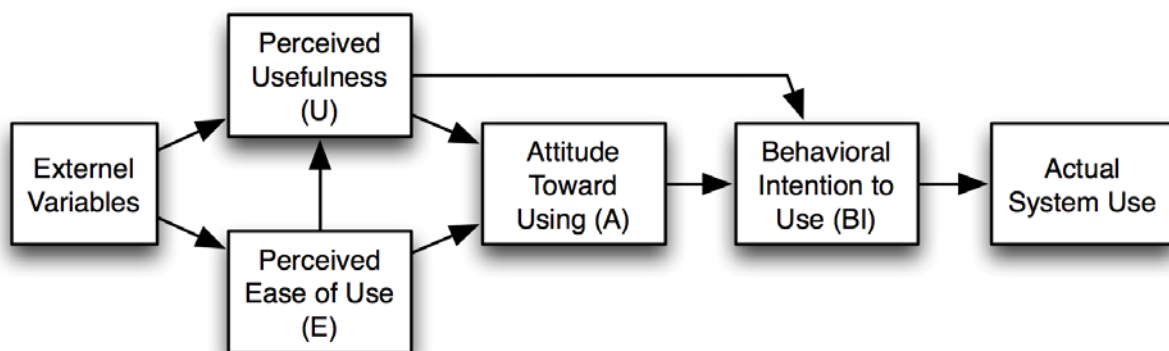


Figure 2.3: Technology Acceptance Model (Davis et al., 1989)

As the model illustrates, these two external variables can be defined as the attitude towards using a certain application. Though it also shows that an end user's behavioural intention to use an information system is determined by the person's attitude towards using the system and perceived usefulness (Ibid.). This implies that people behave in a way that move them towards the intentions of a positive effect. It also implies that people form intentions towards behaviours they believe will increase their job performance, which may eventually also lead to rewards such as pay increases and promotions (Ibid.). Finally, if all conditions are in line with what the model proposes, it will result in actual system use.

There has also been done an extension of the model by Venkatesh and Davis (2000). This extended model is called TAM2, which proposes perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes. The social influence processes are subjective norm, voluntariness and image. Cognitive instrumental processes are job rele-

vance, output quality, result demonstrability and perceived ease of use. Basically, the extension is “showing that subjective norm exerts a significant direct effect on usage intentions over and above perceived usefulness and perceived ease of use for mandatory (but not voluntary) systems” (Venkatesh and Davis, 2000).

2.5 Theoretical framework

To sum it up, municipalities are the interface between government and its citizens on a local level. It is a democratic system with elections every four years. The main goal is to ensure the local welfare and interests. Some of the main responsibilities are childcare, primary and secondary education, care of elderly and disables, social services, water supply, infrastructure, environmental issues, rescue services and emergency preparedness.

A big part of the interaction between governments and citizens is driven by the use of IT. E-government is an abbreviation for electronic government, which refers to the communication, information and transaction-related interactions with stakeholders through IT in governments. The main goal with the concept is to improve performance and processes. E-government also applies on municipalities, which are using IT as a critical resource of their organization when they are fulfilling earlier mentioned responsibilities.

With the increasing amount of data, the need of BI technology has grown for municipalities to better analyse data, respond to stakeholders with accurate data and improving their decision making. As explained earlier, there are room for development in municipalities’ information exchange to deliver right information to the right person at the right time. This provides a distinct point that BI has a big potential of bringing value to municipalities.

BI vendors and consultants are experts in adding value to organizations and know how to customize BI software that will work for the customer concerned. With the conditions for BI success in mind and all the challenges that comes with an implementation in a governmental institution, it is however not always sure that the software is being used properly. It demands encouragement, alignment between BI strategies and business strategies, and also an effective BI governance.

As described in the literature review, acceptance of technology is complex and demands a big effort from the end users. There are many factors that determine the actual use of a particular information system. As proposed by Technology Acceptance Model, the external variables of perceived usefulness and ease of use determine the attitude and behavioural intention of actual use of an information system. When investigating the path that municipalities take from adopting BI to the actual use of BI, TAM is used as a support to determine the factors behind the actual use of BI in a municipality.

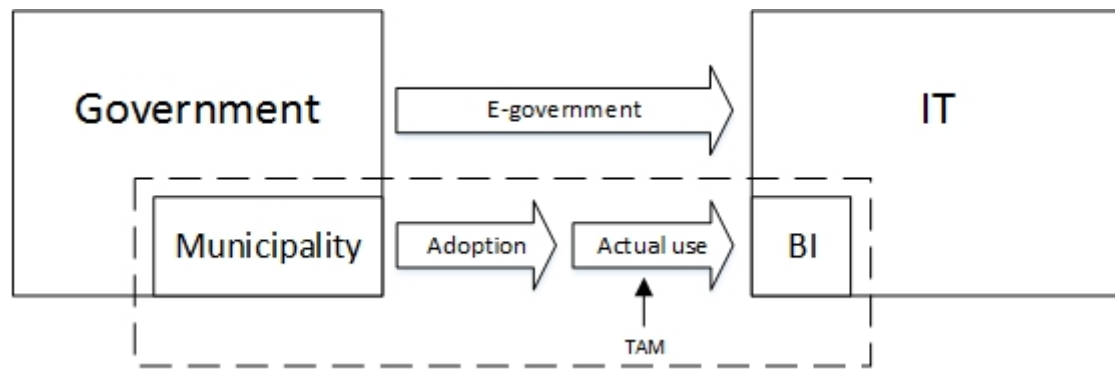


Figure 2.4: Theoretical framework

Figure 2.4 pictures our theoretical framework. This framework is used as a foundation for our research, illustrating the main objectives. It shows the overarching themes, which are Swedish municipalities' adoption of BI and the path they take to actual use of BI in their organization. This is connected to the problem area and research questions which are to illustrate the path municipalities take from adopting BI to actual use of BI and where it adds value. TAM is a support to understand the actual use and e-government is the theory explaining the use of IT in a government.

3 Methodology

This chapter of the thesis explains our methodology, i.e. how we carried out our research process. It consists of method choices, arguments of the method choices, informant selection, interview guide and a reflection to the theoretical framework to motivate why the specific questions were chosen. It also includes research quality and ethics.

3.1 Qualitative method

The aim of our thesis is to show the path Swedish municipalities take from adopting BI to actual use of the software and to illustrate where BI software adds value. To make the decision about a suitable research method, we considered both the aspects of data collection and the purpose of our research. For the data collection, we decided to let BI-experts explain their view of BI software in a municipality and their experience of working with municipalities. Then BI-administrators at municipalities described their view. To accomplish this, we did an exploratory research which according to Recker (2013) is well suited for qualitative methods.

Exploratory research is defined by Recker (2013) as research that encourages the discovery of previously unknown observations where a phenomenon is not yet fully understood, not well researched or still is emerging. We have an interpretive approach and a qualitative method because the research focus on texts rather than numbers. Interpretative research also tends to have a focus on subjectivism and social order (Bhattacharjee, 2012; Orlikowski & Baroudi, 1991). Because of this, the research is inductive since it is about theory building and studying the real world as a social phenomenon (Bhattacharjee, 2012).

Our research questions are:

- 1) *What path do Swedish municipalities take from adopting BI to actual use of BI?*
- 2) *Where does BI software add value to municipalities in Sweden?*

These can be considered as phenomena that are not yet researched or fully understood. BI can also be seen as emerging, since it is a collection of technologies that have had a huge growth the past two decades according to Chaudhuri et al. (2011). By carefully observe and document the path of actual use and where BI adds value to Swedish municipalities, our research is exploratory and has a qualitative approach as defined by Recker (2013).

3.2 Data collection

As mentioned before, we have a qualitative method and the most frequently used method for collecting data in this form is conducting interviews (Recker, 2013). Therefore, we have done interviews with both BI-experts and BI-administrators to get two different angles on the use

of BI in municipalities. Based on the literature review, we determined the questions of the interview guide which is explained later.

3.2.1 *Collection techniques*

Interviews are the prominent form of a qualitative research according to Bhattacharjee (2012). Moreover, he also argues that it is the most suitable technique when doing exploratory research. Kvale and Brinkman (2005) claim that qualitative interviews provide access to subjective experience from respondents, as well as intimate aspects of their life. This is right in line with the purpose of this research, which is about receiving thoughts and experiences from respondents regarding the use of BI in municipalities and the path they take.

Interviews can be done either face-to-face or via telephone (Recker, 2013). We prioritized face-to-face interviews since Bhattacharjee (2012) argues that this form is more personal and the interviewer can observe non-spoken body languages as well as clarifying any issues raised by the respondents. This resulted in 5 face-to-face interviews and 1 skype interview due to distance matter. We also took notes to capture all important comments and observations, such as body language and the personal impressions about the respondents. This is important to consider since impressions can give valuable contributions to the research. Another thing to mention is that we also followed Bhattacharjee's (2012) recommendation to do a thorough investigation in each company to suggest suitable locations and times for the interviews since they all had busy schedules.

Moreover, we had a semi-structured interview approach. According to Myers and Newman (2007), this means there is an incomplete script and the research is open for improvisation. More specifically, we wrote the questions before but left ourselves room to improvise and asking follow-up questions. We prepared the questions and worked on them a lot to be as prepared as possible before conducting the interviews.

The reason for doing semi-structured interviews were to allow development of the plot and give the interview an opportunity to provide new insights, as explained by Myers and Newman (2007). This resulted in us delving more deeply into each interview which gave us better results and more variation in the answers. It also encourages two-way communication and is less intrusive to the respondents (Recker, 2013).

The interview process started with us presenting ourselves and the purpose with our thesis, as suggested by Myers and Newman (2007). We sorted out the ethical aspects, such as permission of recording and approval of transcribing a manuscript. We also asked if they would like to be anonymous or not. Then we continued with the interview guides as explained in the next section and ended with showing our gratitude. More of the ethical aspects is described in section 3.4.

3.2.2 *Structuring the interview guides*

Two interview guides were created in order to collect data from our respondents. When creating the two interview guides, we had the theoretical framework (figure 2.4) and our problem area in mind when specifying the questions. All questions from the interviews are therefore correlated with the theoretical framework.

We also divided the interviews into themes in order to keep a good structure of the interviews. This is one of the suggestions by Myers and Newman (2007) for semi-structured interviews. There should be an opening, an introduction, a part with key questions and a closure. We chose to have the opening part where we introduced ourselves off the record, and the other parts were put in the interview guides.

1) Interview guide for BI-experts

For the first interview guide (appendix 1), we started off with two initial questions. The aim of these questions were to get a brief introduction about the organization, the respondent, his or her work experience, role and relation to BI. These answers were used to put the results in context to the organization and who the person was, as this may affect the outcome of the response.

After the initial questions we continued with the main questions which are divided into two sections. The first part is the value of BI in municipalities. This part is relevant for both research question. With these questions we evaluated the most crucial reasons for implementing BI at a municipality, the stakeholders and what is exclusive for municipalities compared to other organizations.

The next part aimed to evaluate the challenges when working with municipalities. We started off wide by asking the main challenges when implementing BI at a municipality, then we narrowed the challenges and asked more specifically about barriers and issues with acceptance. This was done to question municipalities' adoption and actual use of BI technology, which is in line with the technology acceptance model (TAM) from the theoretical framework. We ended this part by asking if the consultants have the reason to believe that BI is not being used to its full potential. This question was asked to get insights about room for improvements from the BI-experts point of view.

This interview guide is finished by two ending questions asking about the future use of BI in municipalities. This is asked to evaluate ongoing trends and shifts in the use. This is connected to the path to see in what direction we are moving and what more contributions and value BI will provide municipalities with in the future. Finally, the last question is an opportunity for the respondents to add more to the subject that we might have missed and would be important for our research.

Below is a table that illustrates the relation between the interview questions and the research questions, and also the topic of each question.

Table 3.1: Topic relation to interview guide 1

No.	Question	Research question	Topic
Q1	Describe shortly your organization and how you work.		Initializing question
Q2	What are your work experience, your current role and your relation to BI?		Initializing question

Q3	What are the most crucial reasons for implementing BI software at a municipality?	R1, R2	Actual use
Q4	In what areas of a municipality does BI add most value and why? Who are the users and stakeholders?	R1, R2	Actual use
Q5	What are the differences between the values added from BI to municipalities compared to other types of organizations? What are exclusive for municipalities?	R1, R2	Actual use
Q6	What are the main challenges of implementing BI at a municipality?	R1	Adopting BI
Q7	Are there any common barriers or issues with acceptance when implementing BI in municipalities? How are they handled?	R1	Adopting BI
Q8	Could there be any issues implementing BI because of the size of a municipality and the numbers of employees?	R1	Adopting BI
Q9	What is your opinion about stakeholders' knowledge in the BI field at municipalities?	R1	Adopting BI
Q10	How do you work to educate users at the municipality to use the software properly?	R1	Adopting BI
Q11	Do you think municipalities are slower in adapting to BI than companies in the private sector?	R1	Adopting BI
Q12	Do you believe that Swedish municipalities use BI software to its full potential or are there room for improvements? I.e. Is there a gap between what can be done with BI and how the municipalities are using the software?	R1	Future use of BI
Q13	How do you think the future use of BI in municipalities will look? Are you seeing any trends or shifts regarding the use of BI?	R1	Future use of BI
Q14	Is there anything you would like to add to the subject of BI in municipalities?	R1, R2	Ending question

2) Interview guide for BI-administrators at municipalities

For the second interview guide (appendix 2), we had a similar approach as the first one. We designed this interview guide after we had conducted the interviews with the BI-experts. The main difference is that these questions are customized for the BI-administrators at the municipi-

pality, with the aim to get their point of view. We started off with the same initial questions, and added a question about how long the BI software has been in place.

Moreover, we asked questions about acceptance, such as the attitude towards using BI software and the opinion about how useful the software is. We also added a question which aimed to evaluate the progress that municipalities have done over the years. This was done to understand more in depth how the municipality have adopted BI and how the software has evolved. At last, we asked again about room of improvements and what the administrators want to see in the future use of BI.

Below is a table that illustrates the relation between the interview questions and the research questions, and also the topic of each question.

Table 3.2: Topic relation to interview guide 2

No.	Question	Research question	Topic
Q1	Describe shortly your organization and how you work.		Initializing question
Q2	What are your work experience, your current role and your relation to BI?		Initializing question
Q3	For how long has your BI software been in place?	R1	Adopting BI
Q4	Who are the users of the software? I.e. Is it only used by certain people or departments?	R1, R2	Actual use
Q5	What do you want to achieve from the use of BI software?	R1, R2	Adopting BI / Actual use
Q6	In what areas of the municipality does BI add most value and why?	R1, R2	Actual use
Q7	How is the attitude towards using the software at the municipality?	R1	Adopting BI / Actual use
Q8	What is your opinion about how useful the software is for the users?	R1	Adopting BI / Actual use
Q9	What are the challenges of adopting BI at a municipality?	R1	Adopting BI / Actual use
Q10	How do you work with educating the users of the software?	R1	Adopting BI / Actual use
Q11	Do the users find the software easy to work with?	R1	Adopting BI / Actual use

Q12	How has the use of the software evolved over the years? What progress have you done?	R1, R2	Adopting BI / Actual use
Q13	What improvements do you think can be done in the use of BI at your municipality?	R1	Future use of BI
Q14	How do you think the future use of BI in municipalities will look? Are you seeing any trend or shift regarding the use of BI?	R1	Future use of BI
Q15	Is there anything you would like to add to the subject of BI in municipalities?	R1, R2	Ending question

3.2.3 Informant selection

The informants we selected were as mentioned before BI-experts working as consultants or vendors, and BI-administrators working with the software at the municipality. These informants were chosen to provide insights from two different angles, both the experts of the BI software and the BI-administrators who have knowledge about the path from adopting BI to actual use.

According to Myers and Newman (2007), it is a common mistake that a researcher interviews people of high status, also called key informants. Bhattacharjee (2012) also talks about key informants and highlights the fact that an informant might not have adequate knowledge within the field that is being researched. An example is brought up, stating that a CEO might not know employees' perceptions or teamwork in the company. Because of this, the informants selected were done carefully. We conducted three interviews with a total of four respondents, where three of them were working as consultants and one was a vendor. All of them have experience of working with municipalities. We also interviewed the administrators of BI at the municipalities, since they could provide the best insights of the actual use of BI. These two perspectives together provide us with a solid view of the path municipalities take from adopting BI to actual use of BI.

As mentioned before, we started off with the BI-experts to first get knowledge about municipalities' use of BI in general and how they handle municipalities as customers. The interview with the vendor was the pilot interview, which is explained more specifically in the next section. With having the knowledge from the BI-experts point of view in mind, we then continued with the municipalities. Here we interview three administrators of BI at three Swedish municipalities. These people work on a daily basis with maintaining and administering the BI software.

Furthermore, we asked the BI-experts about follow-up interviews, as proposed by Myers and Newman (2007). This was a way for us to let the BI-experts recommend people at the municipality that might be interviewed. This technique is also known as snowballing, which helped us in one case to find another interview.

3.2.4 Interviewing

In order to make sure whether there are problems in our research design and methods including our interview guide, Bhattacharjee (2012) suggests pilot testing prior to the actual data collection step. He emphasizes that pilot testing is often overlooked although it is important as a part of research process (Bhattacharjee, 2012). Hence, we decided to conduct pilot interview to ensure that our research design, especially the interview guide, is reliable.

The pilot interview was done with Qlik, which is a BI-vendor and part of the BI-experts of our interviews. After conducting the pilot interview, we were satisfied with the results we got and decided to keep the same structure of the interview. The final interviews were thus conducted with the selected informants as previously mentioned. However, as mentioned before, we did changes when conducting the second interview guide that were customized for the BI-administrators at the municipalities.

3.3 Data analysis

To analyse the data, we started by transcribing the interviews using a software called InqScribe. The process of transcribing is vital in qualitative research as Hancock et al. (2009) argue that small portion of an interview is often communicated through actual words. They also describe the importance of the interviewer considering feelings and emotions of the respondents. We achieved this by doing punctuation marks.

Table 3.3: Transcript process

Respondent	Transcript	Transcribed by	Verified by
R1	Appendix 3	Hafidz Alhaq Fatih	Tobias Andersson
R2, R3	Appendix 4	Tobias Andersson	Hafidz Alhaq Fatih
R4	Appendix 5	Tobias Andersson	Hafidz Alhaq Fatih
R5	Appendix 6	Tobias Andersson	Hafidz Alhaq Fatih
R6	Appendix 7	Hafidz Alhaq Fatih	Tobias Andersson
R7	Appendix 8	Tobias Andersson	Hafidz Alhaq Fatih

After the interviews were transcribed, we used a data analysis technique called content analysis. Recker (2013) describes content analysis as a semantic analysis of a body of text to uncover the presence of dominant concepts. We also used coding to make sense of the qualitative data since Bhattacharjee (2012) states that the purpose of qualitative analysis is “sense making”. Recker (2013) also argues that the coding technique is very common yet powerful to reduce qualitative data into meaningful information.

We followed the procedures explained by Graneheim and Lundman (2004), who describe the process of content analysis in a qualitative aspect to achieve trustworthiness. First we read the text repeatedly to get an understanding of the whole picture. We picked out the most crucial parts to categorize our findings and find the most relevant data for our purpose and research questions. These units of texts were then summarized and presented with the purpose to make the text shorter than the transcripts but yet still present everything. These findings were coded and presented in the different categories, which we later discussed and analysed in two themes: adopting BI in municipalities and actual use of BI in municipalities. These two themes basically analyse the results of our two research questions, the path that municipalities take to actual use of BI and the value BI software adds to municipalities.

Regarding the actual use, the technology acceptance model has been used to understand the findings from the interviews. As explained by Dahlberg et al. (2003), TAM cannot be tested statistically with qualitative data. It can however be used as a support to explain the findings and determinants of an actual system use. In our case, TAM was used to formulate some of the questions for the interview and also to make sense of the answers to evaluate the actual use.

3.4 Research quality

In order to ensure the quality of this research, we took reliability, validity, bias, and ethics into account. Thus, this chapter provides an overview and a description about these terms and how we tackled them in our research.

3.4.1 Reliability and validity

The quality of a research can be evaluated by its reliability and validity (Bhattacharjee, 2012; Recker, 2013). Reliability refers to the degree to which the measure of a construct is consistent or dependable, while validity refers to the extent to which a measure adequately represents the underlying construct that it is supposed to measure (Bhattacharjee, 2012). In other words, a reliable research should provide a relatively same result if it is repeated using the same methods, while a valid research means that what it tries to measure is correct and not measuring something else instead.

In order to establish reliability, we took several steps to follow. Firstly, we tried to use the same phrasing for all the interviews, including those which are held in Swedish, we tried to agree upon selecting the closest possible terms. Secondly, we started all of the interviews by explaining the purpose as well as the description of key terms used in this study. Thirdly, while our interviews are semi-structured in nature to provide the respondents with higher degree of freedom when answering the questions, we prepared follow-up questions to always ensure that they are in the right track. Lastly, regarding the findings, in order to have a shared understanding and reliable assumption, both of us did the reading of transcribed interviews separately and made conclusions which we then compared with each other. As for the Swedish transcripts, we did English translation prior to understanding the transcripts. Whenever we had different views on the findings, we further discussed them in order to reach a shared understanding and therefore increase the reliability of our findings.

Regarding validity, Recker (2013) classifies three key principles to display rigor in qualitative research, they are credibility (aka internal validity), confirmability (aka measurement validity), and transferability (aka external validity). Credibility refers to the ability of researchers to provide sufficient substantiated evidence for the interpretations in data analysis (Recker, 2013). To achieve this, Recker (2013) suggests triangulation, maintaining a chain of evidence, and keeping clear notes regarding any decision made throughout the research process. Triangulation which refers to improving validity through a multi-perspective view (Recker, 2013) was done by verifying the quality of transcription where one of us transcribed the interviews and the other did the verification. Maintaining a chain of evidence was also done by recording the interviews as well as taking notes during the interview process to emphasize the important parts spoken by the respondents. Keeping clear notes regarding any decision made throughout the research process was ensured by the use of word processing application that allowed us to track any changes or notes.

Confirmability refers to a principle that suggest that qualitative research findings can be verified by outsiders in a position to confirm the findings (Recker, 2013). According to Recker (2013), it is usually achieved by reviewing interview summaries or conclusions. Following this suggestion, we sent the transcribed interviews to the respondents, not only to ensure confirmability, but also to demonstrate truthfulness and receive respondent's' approval. This was done so that the respondents could change, correct, or disapprove the transcribed interview and therefore misunderstandings can be minimized.

Transferability, according to Recker (2013), refers to whether the findings from a study can be generalized to other settings, domains, or cases. The suggestion to achieve transferability is by providing detailed and rich descriptions of the research context so that others can assess the context compared to other fields of research (Recker, 2013). In accordance to this suggestion, we chose the relevant informants carefully as well as provided rich descriptions later on to accomplish high transferability.

3.4.2 Bias

According to Collier and Mahoney (1996, p. 59), the definition of bias is

“... systematic error that is expected to occur in a given context of research, whereas ‘error’ is generally taken to mean any difference between an estimated value and the ‘true’ value of a variable or parameter, whether the difference follows a systematic pattern or not.”

Bhattacharjee (2012) emphasizes that systematic biases often lower the quality of survey research that may invalidate some inferences within the research itself. Regarding our research, there are two biases that we tried to avoid as much as we possibly could. The first one is social desirability bias by carefully designing the interview guides and making sure that the questions would not lead to biased situation. This kind of bias is described by Bhattacharjee (2012) as the tendency of respondents to avoid negative opinions or embarrassing comments about themselves or their relatives. During the interview process, we also tried to spot inconsistent answers and ask probing questions to follow them up as our interview guide is semi-structure in nature.

The second bias taken into consideration is recall bias. Bhattacharjee (2012) explains that respondents' responses are often depend on subjects' motivation, memory, and ability to re-

spend. Especially when the respondents are needed to remember events that happened in the distant past, they may not be able to fully recall their own memory (Bhattacharjee, 2012). In order to overcome this obstacle, we tried to anchor respondents' memory in specific events as they happened, rather than letting them to casually recall their memory.

3.4.3 Ethics

Bhattacharjee (2012) defines ethics as moral distinction between right and wrong, and being unethical does not necessarily mean illegal. The importance of ethics is also stressed by Bhattacharjee (2012) that science has often been manipulated by either people or organizations to achieve their goal in unethical ways. So, when conducting a scientific research, we need to be aware of not only legal aspects, but also the ethical ones. According to Kvale and Brinkmann (2009), ethical issues can arise on each research stage: thematising, designing, interviewing, transcription, analysis, verification as well as reporting. In order to address the issues regarding ethical aspects of scientific research, we intend to follow a guideline as explained by Bhattacharjee (2012) that encompasses voluntary participation and harmlessness, anonymity and confidentiality, disclosure, and final analysis and reporting.

In terms of voluntary participation and harmlessness, Bhattacharjee (2012) suggests that the respondents must be aware that they have freedom whether to participate to the study or not without any harmful consequences. When we contacted the respondents, we asked their willingness to participate in our research. We also asked their preferences, especially language preference since our research specifies Swedish municipalities that might involve respondent who feels uncomfortable to speak in English.

Prior to the interviews, we also asked respondents' permission to record the conversation throughout the interview process. In order to protect respondents' interests and future well-being, their identity must be protected through anonymity and confidentiality (Bhattacharjee, 2012). Thus, we ensured this issue by asking respondents' permission to include their name, company and position within the company at the beginning of the interview. Disclosure refers to brief explanation about the research before the data collection is conducted to help respondents decide whether they wish to participate or not (Bhattacharjee, 2012).

In our case, we provided the disclosure when we first contacted the respondents. The explanations were different among respondents since our subjects are mainly divided into two categories: vendor/consultant and municipality (user). The last but not least important, researchers are ethically obliged to correctly analysed their data and honestly report them regardless negative findings (Bhattacharjee, 2012). Thus, we tried to maintain this state of mind throughout our thesis. We also sent back the result of our transcription to the respondents as final clarification of the answers they had already given.

4 Empirical findings

This chapter presents our empirical findings and starts with a table of the respondent profiles. The results of our interviews are then categorized based on the results from the two interview guides. First we present the findings from the BI-experts, and then we present the findings from the BI-administrators at the municipalities.

4.1 Respondent profiles

We interviewed seven people who are presented in two tables below. The first table consists of four BI-experts, which are one vendor and three consultants working with BI. The second table consists of three BI-administrators working at three different municipalities with maintenance and development of their BI software.

Table 4.1: BI-experts

Respondent	Organization	Role	Date	Type	Location	Duration
R1	Qlik	BI-vendor	2016-04-20	Face-to-face	Lund, Sweden	39 minutes
R2, R3	Acando	BI-consultant (R2), Senior Manager (R3)	2016-04-21	Face-to-face	Malmö, Sweden	25 minutes
R4	Hypergene	BI-consultant	2016-04-21	Face-to-face	Malmö, Sweden	27 minutes

- **Respondent 1**

R1 currently works as quality analyst at R&D division of Qlik, which is a BI-vendor. The company was founded in Lund and now has over 35,000 customers from 100 countries (Qlik, 2016B). Specifically, R1's job is defined as,

...responsible for the product quality in terms of features to bugs to everything regarding customer verification, customer validation of our own product. (3:2)

R1 has around seven to eight years of experience in BI. Prior to R1's current role, R1's previous role was Java developer before joining Qlik. At Qlik, R1 also has worked as presales con-

sultant and internal BI developer previously. That concludes that R1 has experience in both technical and business problems.

- **Respondent 2 and 3**

On the second interview, there were two respondents from Acando. R2 works as a Senior BI-consultant and R3 works as a senior manager handling their business with public sector in Malmö. Acando is a consultancy company with offices in Malmö, Stockholm, Gothenburg, Västerås, and Falun. The company work with for instance IT-management consulting, management consulting and ERP-systems. The part called Digital Consulting & Solutions is where Business Intelligence is included (4:2). The work within BI is mostly with the products from Qlik and Microsoft. R2 has worked with Qlik since 2006, both with R&D and IT. R2's responsibility is to make sure everything is delivered to the customer and that the right people is involved in the right projects. As mentioned before, R3 is responsible for the business with public sector in Malmö and has experience in the dialogue with stakeholders in the public sector, including the procurement process for instance (4:3, 4:4).

- **Respondent 4**

R4 works in Malmö as a BI-consultant at a company named Hypergene. Hypergene is a product company that develop their own product in house and they also sell and implement the product to their customers (5:2). This means that they are both a vendor and a consultant as defined in the literature review. R4 has worked in the company for 2 years as a technical consultant, which involves understanding the customer's business, their needs and wants. This involves "installing, implementing and modifying the system to such a way that it satisfies the customers' demands" (5:4). R4 works with many different industries and projects. This includes municipalities which is a crucial part for the company and where the product is well suited.

Table 4.2: BI-administrators

Respondent	Organization	Role	Date	Type	Location	Duration
R5	Kävlinge kommun	BI-administrator	2016-04-26	Face-to-face	Kävlinge, Sweden	29 minutes
R6	Lunds kommun	BI-administrator	2016-04-26	Face-to-face	Lund, Sweden	29 minutes
R7	Jönköpings kommun	BI-administrator	2016-04-27	Skype	Jönköping, Sweden	22 minutes

- **Respondent 5**

Respondent 5 works since 2012 at the municipality in Kävlinge as a BI-administrator. Kävlinge has a population of 30,000 citizens and the municipality has 2000 employees. The organization has about 80 heads of units, which also have executives working above them. R5 is responsible for maintaining and developing the BI software. However, it is not a full time job and R5 is also working with other tasks in addition to being a BI-administrator. Moreover, R5 has work experience in both IT and finance, and has also worked at the municipality in Malmö and as an IT consultant at ICA.

- **Respondent 6**

The second municipality that participate in our study is Lund which, in this case, is represented by R6. The municipality of Lund has approximately 10,000 employees and has main focus in school and healthcare for elderly people. This is proven by the fact that about 30% of the municipality's expenses go to school and preschool, while the expense going to elderly care is around 25%. R6 has been working in the municipality of Lund for nearly 1 year with a BI platform that was acquired before R6 joined. R6 has a long work experience in BI development by working at the municipality of Staffanstorps for six years on that area.

- **Respondent 7**

R7 has been working at the municipality in Jönköping since 2008. Jönköping has 132,000 citizens, which makes them one of the biggest municipalities in Sweden. The municipality has approximately 12,000 employees, where about 600 people are working as heads of units. R7 has a background of IT and finance. R7 is working full time with administering the BI software and started working in Jönköping the same year as the software was implemented. Thus, R7 has been involved since the software was implemented and has knowledge about all the progress that has been done since then.

4.2 BI-experts' perspective

This section presents the findings from BI-experts point of view and their perspective of the use of BI in municipalities and how municipalities adopt BI. This includes R1, R2, R3 and R4, where one vendor and three consultants are included. It is categorized into value and challenges from the interview guide to see how they perceive the use of BI in municipalities. The findings also provide insights about advantages of Swedish municipalities and the future use of BI.

4.2.1 *The value of BI in municipalities*

R2 argues that one of the most crucial reason for implementing BI in a municipality is to keep track on the finance (4:8). This is often the part of a municipality where they first see a need of BI software. R4 also highlights this area and explain that they need to keep track of finance because municipalities are funded by tax money (5:6). They need to follow up on where money is being spent and how the budget is going.

However, using BI in a financial manner is not exclusive for a municipality, even though it is a crucial part. R1 explains that BI cannot be discriminated between a municipality and other organizations. The main value BI adds depends on what data the organization generate on a daily basis. It can be data regarding citizens, legislations, laws around workflow in the municipality and so on (3:14). R3 also mentions analysis about how the citizens are doing, how many tourists they have each year and attitude surveys. R4 mentions a new module for municipalities about social work with the aim to follow up abuse, addiction, all of the people going to health care, elderly care, and so on.

When talking about where BI adds most value in a municipality, R1 claims that it is hard to generalize. "Every municipality have their own business problems that they want to tackle" (3:16). Though, in addition to finance, R1 has experienced a big need in having BI for allocating human resources within the municipality. The size of the municipality may also vary a lot, which means they will have a different organization structure and thus different needs.

Furthermore, R4 explains that they have modules in their software targeting municipalities that has grown over time. With the finance module being the oldest and most basic modules, R4 argues that this module does not add more value than other areas. The modules can also be used on different levels of the organizations and interact with each other. This means that money from executives on top level can be divided down in the organization to be reviewed and then gradually accepted up to the top level again (5:10).

The most common stakeholders that you are working with when implementing BI at a municipality are executives, according to R3 and R4. This is because they always have a need to keep track of the organization and to make decisions and analysis based on the data. R3 also claims that there are cases where the BI software is used on all levels in a municipality. R2 and R4 elaborate this by explaining that many systems have a built in reporting, which means that BI can exist in different shapes. R4 also mentions controllers as common users of BI software in the municipality.

On top of this, R4 explains that the BI software can also be used between two stakeholders or departments and there are tools to manually input data, feedbacks and comments to the data you are analysing (5:14). Being able to interact between organizations is something we believe is well suited for an organization with the size of a municipality. Especially for the ones that are biggest. It is however always the customer who decides how detailed the solution should be, where it should be used and by whom (5:12).

R4 says that municipalities often start by purchasing BI to one or two parts of the organization and when they realize the value, they continue purchasing more and develop the software further (5:30). It requires a learning process which the extent, according to R2 and R4, only is determined by the interest from the users. Therefore, you cannot argue that municipalities are slower than private companies in the phase of learning and being educated. R1 and R4 also highlight the fact that BI software are generally easy to use, and once users have learned the systems, they become surprised of how much value it can add to an organization (3:36, 3:38, 5:36).

The findings also show that municipalities are mostly using the software internally. R2 claims that the county council of Skåne has a portal where the citizens can access certain reports in the software through the web. However, municipalities have not been prioritizing this government-to-citizen aspect and it is according to R2 a question about how innovative you are in

the organization. Another aspect is that whenever something is going public, it demands a higher cost because a different licence is needed (4:54). The municipalities might not see any value here and are not willing to spend this extra amount of money.

To conclude, Swedish municipalities are in general not very different compared to other organizations when looking at the value added. R4 explains that they have certain modules that are designed for municipalities, such as a school module for statistics about number of kids, how they perform and a comparison between other municipalities (5:16). This means that value from BI is a question of what data is being analysed.

R1 also highlights the fact that municipalities are not business competitors in the same way as private companies. R1 has for instance done work with municipalities regarding charity, where they wanted to measure the amount of charity funds that were given from the citizens in a municipality for a specific cause. This included analysis of information such as where most funds came in, what type of people that donated and so on. This aspect of not being a business competitor is, according to R1, the main difference between a municipality and the private sector (3:18).

4.2.2 Challenges of working with municipalities

The main challenge when working with a municipality is the procurement process, according to R3. This is exclusive for the public sector, meaning that they are affected by a Swedish law called “lagen om offentlig upphandling”. This law regulates all procurements by Swedish authorities and governments that are tax-funded (Riksdagen, 2016). This results in the project taking more time to initialize and also makes it harder for a municipality to choose the best suited consultants and software they would like to have (4:22). R3 and R5 also explain that municipalities often have to pick the cheapest alternative.

Furthermore, R2 says that when municipalities are making a decision about something, it usually takes more time. When doing the procurement, it is not a matter of course that the discussion is with a person at the municipality that is authorized to make the decisions. There are more intermediaries and this makes it take more time to initialize a project. R4 also explains the fact that municipalities invest in technology for many years and they might have to wait for a while before they are allowed to make a new procurement (5:40).

Since municipalities have more bureaucracy, there is also a difference in how they are organized compared to private companies. R2 explains that they are big organizations and the different departments work independently from each other. This means that different managers does not always observe each other and have knowledge about each other's work. In the private sector, this is rarely the case.

R2 also explains that different BI vendors can be focusing on different divisions and market themselves to for instance a sales department or a finance department. The results of this is according to R2 and R4, as mentioned before, that BI can exist in different shapes in a municipality and different tools can be implemented in different divisions. According to R4, this does however not make the implementation more challenging since consultants customize the solution to do the task that is required in each division.

Because of this breakdown of divisions, R2 means that a municipality is a conglomerate, which is challenging for BI consultants when implementing BI (4:25). R3 explain that this leads to issues in getting a comprehensive understanding of the data source. To be able to do this, consultants need to first identify the right people on the right levels in the municipality and then create an image of what the municipality wants to achieve from the BI solution. This is more challenging compared to the private sector, where the different divisions have better knowledge about each other's operations.

Moreover, R1 explains another big challenge, which is that municipalities are much unstructured in their way of storing data, and they lack proper processes in handling the data. "It is a big challenge for someone to dig out and see the problems in the data, then analyse, verify and validate the data with the municipality itself and create a BI application" (3:20). R1 develops this argument further by explaining that all municipalities handle or generate their data differently. This is a common issue when working in any BI project. This complexity is handled by communicating with business owners, which often are the people responsible for the project in the municipality (3:24).

However, R4 would not say there are any main challenges for municipalities in particular (5:20). R4 explains that the amount of weird bugs and technical issues that might arise are infinite, and that there is no pattern of a few main challenges which occurs. Yet one problem according to R4, is when the customer does not put enough effort into a project. Municipalities tend to have a huge workload which makes them busy. The customer knows their business best, and if they do not put the effort needed into the project, it becomes challenging. As an example, R4 explains that the number of kids in a school is outside a consultant's knowledge, and therefore a principal must take part to validate the data. It could therefore be challenging to make a municipality find time for a BI project because of their busy schedules.

Regarding acceptance of BI software in municipalities, R2 claims that there is a clear hierarchy of executives in a municipality. This means that once it is decided that an implementation is going to happen, the employees have to adjust. There is not much room for testing different software or suggesting another solution. You are locked to the decision made by an executive on a higher level (4:28). R4 explains this further by saying that it is essentially about saving money for the executives (5:22). If the BI software can replace manual labour and save money, they will purchase it. The person doing this manual work will obviously feel threatened, but will have to adapt anyway. R4 concludes this matter by saying that "the executives have a lot of pressure to be efficient so that is what it should be since it's tax-paying money" (5:24).

As mentioned before, the size of a municipality may vary a lot and the size could also play an important role in how the BI software has developed over the years and what it will look like. R1 highlights the fact that the bigger a municipality is, the better are the systems of storing the data. When going to smaller municipalities you are more likely to find unstructured data, located in an Excel file for instance. In essence, it becomes more complex to implement BI when data is unstructured.

The main reason behind this variety in structuring data is explained by R1 to be the fact that bigger municipalities have a bigger need of keeping the data structured and having an organized method of generating data. R1 exemplifies this by giving a case of a road complaint. In a small municipality this might get stored in an Excel file, but in a bigger municipality the complaint might end up in an ERP-system. To conclude, it becomes more complex to install BI software when working with unstructured data.

On the other hand, R4 says that a big municipality is not an issue per se when implementing BI, though “it raises the stakes more” (5:26). If the system goes down in a small municipality, the damage is not as big as in a large municipality where it could be hundreds of users. “Every minute here is a minute of time where hundreds of people not being productive” (5:26). R3 also highlights the fact that a municipality is usually always the biggest employer at each given city.

4.2.3 Advantages of Swedish municipalities

After conducting the literature review, we had the reason to believe that public sector and governmental institutions like municipalities were slow in adopting new technology. Even though this is true to a certain extent, the findings also show that Swedish municipalities are very modern and at the forefront in implementing BI.

R1 says that adoption of BI in municipalities vary a lot. The main determinants of adopting BI are described by R1 as the amount of technical people the municipality have and R2 says it is about how visionary the executives are. The amount of technical people in an organization combined with how visionary executives are, will therefore determine how good a BI implementation is. R1 develops this further by explaining that Sweden is a rare case since this country is high-tech. R1 also says that Sweden has a bigger ratio of BI implementations than other countries in the world and that this most likely is a result of the country being high-tech (3:42).

“...it’s actually really good ratio. For example, the implementation of BI solutions in Swedish municipalities is quite good and the employees accept it. It’s amazing. Even Swedish police uses BI: QlikView, which is in a similar aspect.” (3:44)

When comparing Swedish municipalities’ adoption of BI with the private sector, R1 says there is not a big difference. R1 explains that municipalities are not on the same level as private sector yet very close. This is a reasonable proof of Swedish municipalities being very good in adopting BI. R4 also agree with this by saying:

“I think Sweden is exceptionally good at BI. Especially in the public sector. I think there was an article saying that Swedish public sector is among the best in the world when it comes to BI.” (5:32)

However, R4 is not entirely sure why Swedish municipalities are good at BI, but believes that laws and regulations could be one reason. They need to store a lot of documents, such as grades from school and other data. All of the big authorities in Sweden have tools and services to work more efficient. R4 exemplifies Skatteverket, which has come really far with the use of technology. To conclude this statement, R4 says that BI has become a natural thing in Sweden and the public sector is generally quite modern in the use of technology. A statement that R4 also thinks can be applied on all levels in the public sector.

By looking at the statements saying that Swedish municipality are at the forefront, you can conclude that some of the challenges from previous subchapter become irrelevant. The challenges of municipalities being slow with the procurement process does not really matter according to R4 since they have come pretty far already. The BI software is already in place.

However, there is also a big variety in how far the municipalities have come. Both R3 and R4 are saying that all municipalities have some kind of BI software installed in their organizations, but it is being used to different extents (4:42, 5:48). R2 illustrate this by saying that the municipality of Malmö has come really far in their process of adopting BI, and both R2 and R3 believe that the regional county council in Skåne has the biggest QlikView-solution in the world if you count the number of licences.

In conclusion, the degree of maturity is different among both municipalities and other instances of the public sector. R4 believes that the extent of how far you have come in adopting BI is determined by when the BI software was installed and when the practices about storing data properly were put in place. However, all respondents are more or less saying that Swedish municipalities in general are doing well at adopting and using BI in their organizations.

4.2.4 Future use of BI in municipalities

Regarding the future use of BI in municipalities and possible improvements, all respondents agree on the fact that you can always do more. R1 says that you can never have a perfect solution and it is an agile process of improving the software (3:54). The vendors and consultants can always propose a solution, but it is up to the municipality to decide if they are willing to make the investment of adding more functionality. Though R1 has the reason to believe that BI will power business users even more than it is doing today, and also to let simple employees of the municipalities use the tools to a bigger extent.

R2 also claims there is more potential and more areas within the municipality where you can use BI. It is clear that BI adds most value to financial and HR departments today, but it will probably be a wider spread in the future. However, R2 says it is only a question about how they prioritize their budget and what they would like to visualize (4:47). At last, R2 also believes there will be more tools in the future that are customized exclusively for municipalities.

Finally, R4 describes a trend of more municipalities starting to put together different modules that before talked separately (5:44). For instance, by connecting finance to the school, it is possible to see what every single grade and teacher cost in relation to all grades the teacher gives. It opens up doors where you can do more correlations and get more value from new connections. However, R4 thinks the possibilities are endless and that municipalities are moving towards a positive future.

4.3 BI-administrators' perspective

This section presents the findings from the municipalities' point of view and their perspective of the use of BI in municipalities. This includes interviews with R5, R6, and R7, which are BI-administrators at three different municipalities. The chapter is divided into each municipality to separate how the different municipalities perceive their own usage of BI within the organization and what they want to achieve with the software.

4.3.1 *The municipality of Kävlinge*

The municipality of Kävlinge is the smallest one of the three we interviewed, with 2.000 employees and 30.000 citizens. They have about 80 executives who are the main users of the BI software. The BI software, which is called Hypergene, was implemented in 2009 and R5 started working as an administrator in 2012. However, the main goal of the implementation was for executives to follow up their departments. It started with finance and HR, and has evolved from these areas to more people. According to R5, the main vision of having BI in the municipality of Kävlinge is to make knowledgeable and accurate decisions and to gather all important information in one place.

R5 claims that the BI software adds most value to finance and HR, but almost all people find it useful when it gets implemented in different divisions as well. The tool is also being used by executives in school, but according to R5 there are room for improvements and the municipality is right now working on a plan to make improvements here. R5 also highlights that BI is really important for newly recruited executives to quickly get an overview of the organization.

The municipality of Kävlinge is also presenting some information from the software to citizens. This is used for citizens to compare key figures of schools, retirement homes, home care, preschools, and so on. It also allows citizens to compare with other municipalities and to measure the quality of different municipalities. This is also a part which R5 believe there is more potential. R5 also explains that comparing themselves with other municipalities is something they do to a great extent.

The attitude towards the software varies. When R5 started working in the municipality of Kävlinge a lot of people had a negative attitude. R5 had the perception that the municipality just bought the tool and simply wanted it to work immediately. The people at the municipality did not realize all the effort that was needed locally. With the software being half finished, R5 found it reasonable that the attitude was bad. However, as of today that attitude has changed and R5 has seen a shift towards a more positive attitude from the executives. More people understand what value the tool provides and they find it really useful.

The municipality of Kävlinge has also developed the software over the years. The school module was not implemented from the beginning and they are right now in the process of getting data from elderly care to the BI software. R5 explains that they would like to be more transparent, allowing the users to follow up their organization by getting more data in real time. There has also been a lot of progress done with budgeting and prognosing. R5 says that in the beginning it was hard to make the users use the software at all, but now it is on the contrary and non-users want to become users. To sum it up, Kävlinge has clear goals of what they want to do and they always strive to get the most of the software as possible.

R5 has also been working to a certain extent with educating the users and helping them use the software properly. They also get tips from their supplier on this matter. Nevertheless, R5 would like to see an even bigger interest from the management, asking more questions and wanting to do more with the software than they do today.

According to R5, the main challenges with adopting BI software in a municipality is the dissimilarity of different divisions. By having some people mowing lawns and others working in school, R5 claims it is hard to systematize and compare data between the different divisions.

There are also different opinions and people having different needs to fulfil. However, R5 does not believe this challenges have anything to do with the size of a municipality but rather the fact that they are working with the BI software in-house. R5 says that municipalities purchasing their orders from people outside the organization have less opinions and details in their software (6:26).

Furthermore, the attitude towards the ease of use is good. R5 claims that it is easy to get started, but there are some more advanced analysis and functions that can be harder for people to learn. The products are however built to be easy by providing the users the correct information immediately. R5 also has the reason to believe that the tool itself is not the key factor to success, but rather having clear goals and making the processes in the municipality work according to their visions.

When asking R5 to compare the BI software in the municipality of Kävlinge with the private sector and other municipalities, R5 believes that there is a big gap in how frequent you use the software. Some municipalities are really good and some are not. R5 also thinks that speed is more important in the private sector, to get results quickly. For a municipality, R5 says that there is no political attraction to spend a lot of money on technology if you cannot motivate why this is important (6:50). R5 is pleased with the fact that they have the role of a BI-administrator in place and explains that all municipalities do not have this. As stated before, R5 also claims that laws and regulations will make municipalities to pick the cheapest alternative. Quality cannot be used as a factor in the selection process.

When asking about room for improvements, R5 sees more potential in printouts and reports. Today, the software is good at gathering, counting, matching and making sense of data. However, the part of analysing the data, making comments and input data can be done much better according to R5. Also the speed and look of the reports can be improved. By the ability of making notes inside the software and having everything in one place, R5 believes it will be easier to follow up the organization and forward reports to colleagues.

At the end of the interview, R5 highlights once again the challenge of the municipality being big and wanting many different things. Everyone has different expectations and therefore it is important for a municipality to prioritize. It is a lot of money being spent on technology and since an information system cannot do everything, R5 says that you have to discuss and determine a common denominator in your solution. This is for instance to prioritize laws and regulations and storing data that has to be stored according to Swedish law.

4.3.2 The municipality of Lund

R6 describes that the municipality of Lund is currently using a combination of two platforms as their BI solution, namely QlikView and Stratsys. However, that combination has only been implemented since last year. Before that, it was only QlikView which has been used by the municipality for about ten years. The distribution of access to the systems also changed. Previously, the old system was only accessible for some parts of the organization, whereas now, the organization have the license that allow every employee to work with the system. Furthermore, R6 categorizes the users of the BI software into two main groups (7:12). The first group is departments that provide services to other departments such as finance and HR departments. R6 calls this group as specialists (7:12). The other group of users is managers in general like chiefs or CEOs.

According to R6, the implementation of BI in municipality is due to two primary reasons. The first one is to simplify the process of decision making and data illustration. The other one is to achieve a higher level of organization maturity in terms of making use of data.

R6 says that it cannot be generalized what areas of a municipality that are getting most value out of BI (7:18). The value will depend on the type of source data and how well the users work with the data. Therefore, the value which are produced to each department will be different. For instance, some departments feel significant time saving while others feel improvements in quality and resource effectiveness. That being said, R6 concludes that in the end, the organization as a whole is the one gains most value in total.

When it comes to the attitude towards the use of BI, R6 says that even though it varies for different users and needs time to be completely accepted, the general attitude is very good (7:20). R6 mentions that specialist groups in particular are very enthusiastic to use BI. Meanwhile, some of the rest are more resistant to some extent since they are used to the more conventional way of work. Some user resistance is said by R6 to be only a matter of time due to their workload that deals with a big amount of people and data (7:20). Furthermore, it is highlighted by R6 that there are indeed several factors to this resistance, but age is not one of them. Instead, how used people are to work with data is a crucial factor. Another notable factor is organization's culture such as communication and participation.

As stated before, that the municipality of Lund implement two platforms, R6 says that both of them are easy to use for users as they are designed to be slim and effective (7:38). That is why, according to R6, the softwares are useful for the users by delivering a lot of value such as time saving and sharpening the use of data for decision making.

Talking about challenges, R6 mentions at least six points during the interview. The first challenge is the nature of work in municipalities and that they are having various sectors meaning a lot of different data needs to be handled. The second challenge is that, especially in a municipality, decisions are not always data driven which is the case in most companies. Since quality of service is the topmost priority of municipality, R6 says that instead of money, decisions can sometimes be based on ideological grounds, instead of data (7:28). Thirdly, the general approach to data and BI is relatively low in public sector in Sweden since historically they were not used a lot. The next challenge is the number of users. This is related to what was mentioned earlier that the municipality of Lund have around 10,000 employees. Even though size is apparently a challenge, R6 also argues that at the same time, it is also an opportunity (7:30). The fifth one is regarding safety and security. R6 mentions that the data within the municipality is very sensitive most of the time (7:28). The last one is the organizational structure that does not allow the municipality to work as smooth as private companies when implementing BI. R6 says,

“... the implementation part is a lot harder for us because we don't have an obvious CEO that can tell everybody what to do or choose another job. We don't work that way. We are not that kind of employer and we never will be.” (7:54)

In exchange, a municipality is bound to follow government's policies. That is why R6 concludes by saying that the management part of BI is extremely important.

In terms of educating the users of the software, R6 divides the explanation based on the softwares being used. Regarding QlikView, the education responsibility is handled by the vendor

directly. For Stratsys, the education process is held by the experienced users within the municipality. In addition to that, there is an on-demand hotline to give more flexible help to the users. The municipality also use a “super user strategy” to help educating the users. There are 1-5 super users that are located in every department. R6 explains that these super users are basically people who know more about the applications and the systems as well as understand the integration and relations to the systems (7:32).

Due to the short work experience in Lund, R6 cannot say much about how the use of the software has evolved over the years. A big change however took place during the past six months when the municipality scaled up the number of users from only about twenty to four hundred. A lot of evolvments has been done almost every day as new apps and solutions are launched every week. R6 also emphasizes that the adoption of BI softwares is not like one-time delivery project, but rather has intense relation between the municipality and the vendor over time (7:44).

For the following years, R6 says that the focus of the municipality will still be around building new apps as well as educating the organization about how to work with BI, when to use it, how to secure data, etc. (7:48). This means that the municipality is not only putting their focus on the systems, but also on the human capital within the municipality. The reason behind this is that maintaining the existing systems is not the only important thing to do, but rather the process of improving organization’s maturity.

As the interview moves to the closing part, R6 mentions a trend that is currently happening where the municipality is getting better on negotiations and improving features with BI systems. For example, the municipality always demand possibilities to integrate with QlikView when buying a new system for any particular purpose, such as finance for instance. In addition to that, R6 also emphasizes that the use of such systems is moving to a more professional level (7:50).

However, there is a conflict happening within the municipality regarding the possibility of analysis redundancy. The fact that BI is integrated in different layers of the organization means that they have many possibilities to analyse their data, but they are separated in many systems. Thus, R6 suggests that the municipality need to stay committed to uniting their data in one place (7:50). That suggestion is also dubbed as general trend which will happen in many municipalities in the near future.

Lastly, R6 adds more discussion regarding challenges in public sector. It is usually missed when discussing BI that the actual decision making part is very different in public sector compared with the private sector. Unfortunately, BI vendors tend to “make” municipalities as a private company. For instance, a decision is always measured by simply finding which alternative that is better between the available options without considering aspects that bind the organization such as regulations, in contrast to private sector which tends to have more entrepreneurial ideal in making decisions. This is why R6 explains that this part of the BI software is never applicable to municipalities because they do not need it. On the contrary, R6 argues that the actual decision making is a tradition which lies within the public sector, which makes them better than the private sector. R6 says that reason for this is the fact that a municipality’s base always is democracy, which leads to natural processes for actual decision making.

4.3.3 *The municipality of Jönköping*

As mentioned before, the municipality of Jönköping is one of the biggest municipalities in Sweden with about 12.000 employees. Since 2008, they have been using QlikView, where R7 has been working as an administrator of the tool during the whole time. The tool was mainly initialized as a support for the 600 different executives in the organization and to aid them in making decisions and doing analysis.

R7 says that the tool is mainly used by HR and finance (8:8). There is also a smaller amount of specialists that use the tool for other reasons, such as admission to school or information from all parking meters. Thus, R7 works full time with the BI software to further develop the solution based on employees' needs. However, for bigger projects R7 usually hires consultants to share the workload.

The main value that Jönköping wants to achieve by having BI software is to provide a shared view of the organization. R7 explains that all the executives need to have the same view and point their work towards the same direction and towards the matters that is most important to follow up. Before the BI software was in place, the executives had to work in advanced systems where they often got wrong data due to lack of knowledge in proper use. R7 says that BI software is much more user friendly (8:10).

Moreover, R7 claims that the BI software helps the organization to provide qualitative data and you can faster see when something goes wrong. For instance, if there is an up going trend in costs you can work proactively by analysing this from the graphs. It also saves a lot of time and the executives can put more work on their core activities rather than spending all the time on a computer. According to R7, saving time and removing manual labour were also two of the main goals when implementing the BI software in 2008.

When asking where the initiative of implementing the BI software started, it is clear that finance is the backbone. R7 says that the software is based on the finance, and then they have made progress from this point. For instance, a system for elderly care is connected to finance, showing information such as how many hours of home care services that have been made in relation to the budget. By combining the systems, you can add value to different areas of the organization with finance as the foundation.

Already at the initialization in 2008, the municipality of Jönköping had the goal of starting off wide by implementing BI to four big systems at the same time. These were finance, HR, school and elderly care. The reason of this was according to R7 that all executives should have all the relevant information in one place. Instead of starting in one area, their goal was to add value with BI software to all executives working with analysis and decision making.

The main challenges with adopting BI in the municipality of Jönköping is according to R7 the fact that the systems do not talk with each other. In the case of finance and HR, there are code strings making them easy to connect. The challenge is however, whenever another system with other code strings is going to be attached. It is a lot of work with creating matching keys and the municipality of Jönköping has about 500-600 systems which basically are not interacting with each other.

Since 2008, the municipality of Jönköping has done a lot of progress. Today, they have around 100 applications of QlikView that are connected to different data sources and about

3.000-4.000 logins every month from the 600 users. R7 says that they always strive to find new areas where the software can add value (8:20). A lot of work is done in-house, which reduces the cost. Whenever someone in the municipality needs something, R7 is contacted and they try to solve the issue together. R7 also says that their employees have become really good at understanding BI, and they do not hesitate in asking for more functions in the software (8:20).

Moreover, R7 also claims that other municipalities have not done the same progress on the matter of getting a good response and understanding from users. R7 believes that the success factors are to market the software to the employees and create interfaces that are easy to use. Thus, many of the users in the municipality of Jönköping have a positive attitude towards the software and are getting really impressed and satisfied about the value that can be provided. However, R7 also claims that there is undeniably a certain amount of people that do not like change.

To make the BI software easy to use, R7 is working with key users that have relevant knowledge about all the needs. R7 also gets inspired by other municipalities and BI consultants that release news about the software. R7 tries to target the most relevant information and create simple interfaces. Overall, the users are satisfied with the solution and R7 perceives that the users think it is easy to use.

To sum it up, when communicating with other municipalities R7 believes that the municipality of Jönköping is at the forefront in adopting BI. When asking about the reasons behind this, R7 would not argue that the size of the municipality matters. Instead, it is about what strategy you have and who is working as a municipal manager. In the municipality of Jönköping, BI software has been a part of their strategy for a long time and R7 claims that it has been really successful because of that.

Another reason behind the success is the simple fact that an administrator is in place, working with the software full time. R7 believes that without an administrator, it would not work to have BI in the municipality. Again, R7 refers to other municipalities where they have had different people working part time on administering the BI software, and this has only resulted in conflict issues. By not working full time, R7 believes that the responsibility of administering the BI software is being pushed aside.

Moreover, R7 also argues that there are challenges with only having one person being a BI-administrator at a municipality. Whenever R7 gets sick or has vacation, there could rise issues that cannot be solved by other people. R7 compares this with Helsingborg where they have about 6 people working with the BI software, and on top of that they also have fewer users. R7 believes this is an area where there is room for improvements in Jönköping since they are very dependent on the software.

Another interesting fact with municipalities is that they often share knowledge with each other. R7 claims that since municipalities are not competitors to each other, they have a good network of skill transferring. This means that R7 will share the solutions with other municipalities, whenever they ask for it. This is a success factor that R7 believes to be really valuable for municipalities, and R7 elaborates this by saying that BI does not have to be expensive if you are clever and cooperate (8:22).

At last, when asking about room of improvements and the future use of BI in the municipality, R7 replies similar to R5. R7 would like to see more input options. At the moment they are using QlikView together with another system called Stratsys, which is the same setup as R6 described. QlikView is used for analysing and Stratsys is used for commenting. R7 would like to have the opportunity to do both in one tool, basically to have a better interaction between input and analysis, such as adding projections, comments and columns to reports.

5 Analysis and discussion

In this chapter, we discuss and analyse our findings by reflecting back to our theoretical framework, putting our findings in context with the literature review. It is divided into two sections, where we first analyse the part where municipalities adopt BI in their organization and then we discuss the actual use of the software. These two sections together illustrate the path municipalities take from adopting BI to actual use of BI software. There is also a final section describing the future use of BI in municipalities.

5.1 Adopting BI in a municipality

As described in the first chapter, Cherkis (2013) claims that governments are complex because of the big number of employees and regulatory requirements, and are therefore more problematic to work with when adopting new technology. West and Lu (2009) also explain that governments tend to be slow and resistant because of less competitiveness compared to the private sector, and in addition to this, Moon (2002) says that municipalities are in an early stage of adopting technology.

However, Chen et al. (2012) claim that BI can leverage opportunities in governments and there is also an example by Savoska et al. (2008) illustrating how a municipality in Republic of Macedonia is using BI to visualize data, do analysis and make decisions. Based on our empirical findings, Swedish municipalities have adopted BI really well with the software being in place for many years. The municipality of Lund implemented BI in 2006, Jönköping in 2008 and Kävlinge in 2009. All BI-experts (R1, R2, R3, R4) believe that Sweden is quite modern and at the forefront in the process of adopting BI. It is also clear that all municipalities in Sweden have adopted BI software, but it could vary a lot how far they have come.

The main challenge when adopting BI in a municipality is described by both BI-experts and BI-administrators to be the fact that the procurement process is slow and municipalities always have to pick the cheapest vendor. The reason for this is a law called “lagen om offentlig upphandling”, which regulates all procurements by Swedish authorities and governments that are tax-funded (Riksdagen, 2016). By having this law, municipalities cannot pick the vendor or consultant that provides the best solution qualitatively. This fact also goes in line with the argument by Moon (2002), stating that the lack of financial capacities is a major barrier to the development of e-government in municipalities.

It is also explained by R2 that municipalities have more intermediaries when initializing a BI project. The person discussing the procurement may not be authorized to make the decisions about the project. R4 also claims that municipalities invest in technology for many years, which means it could take many years before they are allowed to adopt new technologies and do new procurements.

Once a project has started, BI-experts treat municipalities the same way as companies in the private sector. It is a question about fulfilling needs and saving money, which are the same goal for everyone who wants BI software implemented. In reflection to the literature review, Seifert (2003) claims that it is common that policy makers in governments demand cost cuttings and efficient procurements. However, the speed of adopting BI in an organization is described by the BI-experts to be about interest and how innovative executives are. There is thus no evidence showing that Swedish municipalities are slower in adopting BI once a project is initialized.

Furthermore, the size of a municipality is big and the operations in municipalities are very diverse compared to private companies. The municipality of Kävlinge has 2,000 employees, Lund has 10,000 and Jönköping has 12,000. As mentioned before, Cherkis (2013) claims that it may be complex to adopt new technology in governments because of the size. Based on the findings, this argument does not apply on Swedish municipalities adopting BI. This is because BI often starts in a certain area, such as in the finance department, and is then spread to other areas. You can have certain modules or certain installations in different departments.

Moreover, R4 says that in a big municipality the stakes are raised and if the system would go down, it affects more people. R1 also claims that bigger municipalities have more structured data, which could make it more complex to implement BI software in a smaller municipality where the data is more unstructured. There is however no pattern of bigger municipalities being better in adopting BI than the smaller ones. On the contrary, R7 exemplifies some smaller municipalities that have adopted BI really well. Also, the municipality of Kävlinge can be considered as a small municipality and the findings do not show any major gap in the adoption compared to Lund and Jönköping. These results can therefore be summarized as the opposite of the argument by Moon (2002), stating that larger governments are more proactive and strategic in advancing e-government.

What determines a successful adoption of BI in a municipality is according to the respondents the way it is approached from executives and how innovation-inclined the organization is. This goes in line with the conditions of BI success in the literature review, which basically are that senior management has to believe in BI and have a positive vision for BI (Watson and Wixom, 2007). In addition to this, Moon and Norris (2005) also argue that there is a link between a culture of innovation and the development of e-government. More specifically, municipalities that implement managerial innovations actively will more likely have a strong innovation culture, making it easier to adopt e-government initiatives with less administrative resistance.

Regarding BI failure, it is stated by Watson and Wixom (2007) that the lack of high-quality data is the most common reason to why BI projects fail. In comparison to our findings, extracting high quality data and saving time were the main goals when the municipality of Jönköping implemented BI in 2008. This demonstrates how crucial the data is when adopting BI and the fact that the municipality of Jönköping was aware of this can be considered as another success factor when adopting BI.

Moreover, the findings also show that the amount of technical people will determine how good a municipality is at adopting BI. R1 explains Sweden as a rare case since the country is very high-tech and is having a bigger ratio of BI implementations than other countries in the world. Sweden is also described by R4 to be exceptionally good at BI, especially in the public sector.

The above statements are most likely results of Sweden being one of the best countries in the world on the list of networked readiness index. According to Dutta et al. (2015), the global information technology report from 2015 shows that Sweden is on third place on this index, which measures how good a country is at exploiting the opportunities offered by ICT. This is both in terms of competitiveness and well-being. It is described in the report that Sweden is one of the best in the world in its political and business environment, with an outstanding readiness, excellent infrastructure, affordable ICT access and a highly skilled population. 95 percent of individuals are using the Internet and Swedish companies are described to be highly innovative in creating new products and services (Dutta et al. 2015).

In conclusion, the main challenge when adopting BI software in a Swedish municipality is the procurement process and the fact that Swedish municipalities have to pick the cheapest alternative. However, this challenge is not what determines if the adoption will be successful or not. The findings show that it is mainly about having a clear vision and goals of what you want to achieve with the software, which also according to R5 do not depend on the tool. Additionally, with the fact that Swedish municipalities have had BI software implemented for a long time already, they are more likely to be in the phase of further develop the software than adopting it and installing it for the first time.

5.2 Actual use of BI in a municipality

It is clear that Swedish municipalities are good at adopting BI software and municipalities have had the software implemented for many years. This leads to the actual use of BI software in municipalities, which based on the findings look various in different municipalities. Regarding acceptance, the findings show that once the BI software is in place, the users have to adjust. According to R2, there is a clear hierarchy of executives in municipalities, and once something is decided you are locked to this decision made on a higher level.

The findings show that BI in municipalities is mainly about saving money and replacing manual labour by giving executives in the organization a shared view, and to work towards the same goals and visions. For municipalities, all respondents are aligned with the fact that BI provides great value in HR and finance departments of municipalities. This can be connected with the statement by Zeb et al. (2012), explaining that IT is being used in municipalities for finance and accounting. R4 also point out that municipalities are funded by tax money and it is therefore natural that the use of BI in finance is important. Findings also show that finance usually is the backbone for implementing the BI software. Additionally, Moon (2002) argued in 2002 that municipalities in the future would be required to do more technical, personnel and financial commitments to achieve more value from e-government. Today's use of BI can be seen as an indication that these commitments have been made in Swedish municipalities.

In addition to finance and HR, the findings also show a need of BI in school and elderly care. For instance, in the municipality of Jönköping, the main vision was to implement the software in these four divisions: finance, HR, school and elderly care. The idea behind this was that all executives should have a shared view of the organization with all relevant information in one place. In comparison to the municipality of Kävlinge, there is room for improvement in the school module and they are in the process of implementing a solution for elderly care. R1 also explains that municipalities have used BI regarding charity matters to do analysis of where most funds came in, what type of people that donated and so on.

As proposed by the Technology Acceptance Model, the external variables of perceived usefulness and ease of use determine the attitude and behavioural intention of actual use of an information system (Davis et al. 1989). Findings show that BI-administrators at the municipalities have the reason to believe that the users find the software really useful and easy to use, which correspond with the elements in TAM that leads to actual system use.

Furthermore, the findings also indicate that the attitude towards BI varies. There are always people being resistant and the municipalities try to solve this by identifying key users to educate the resistant people and to make the software even easier. R5 claims that most people find the software useful when they actually start to use and understand it. Findings also show that BI software often is considered as a very easy computer system, and since it is increasing the user's job performance, BI will most likely be accepted easily. This means that users' behavioural intention to use BI software in the municipality is positive and in line with the factors in TAM as explained by Davis et al. (1989).

Nevertheless, Cherkis (2013) argues that governments are resistant to new technology since they are less competitive than organizations in the private sector. Isik et al. (2011) also claim that BI is about adding business value and improve competitive advantage. However, our findings show that municipalities not being competitive is also beneficial. R7 claims that municipalities in Sweden have a good network of skill transferring which means that they can share solutions between each other. Municipalities do not have to be afraid of sensitive information leaking to other municipalities since they are governmental institutions with the main objective to ensure local welfare and interests (Regeringskansliet, 2015). This is exclusive for municipalities and R7 believes this is one of the main factor to BI success in municipalities and also points out that cooperating saves a lot of money.

All three municipalities are developing their software continuously and are making improvements all the time. It is clear that having an administrator in place is crucial for the actual use of BI software in a municipality. R7 believes that having no administrator of the tool will result in conflict issues since no one has the main responsibility. This can be connected with the statement by Pettey and Van Der Meulen (2008) saying that the biggest mistake one can make is to not have a documented BI strategy and a BI competency centre to drive the development of the BI software further.

Having the role of a BI-administrator in place is a good way of working towards a shared BI strategy by having a person responsible for the BI initiative, striving towards a common goal and vision. R6 also highlights the management part as an extremely important factor in the domain of BI software in municipalities. The fact that Swedish municipalities have BI-administrators in place is a proof of taking BI seriously and understanding the value of BI. However, the findings also indicate that all municipalities in Sweden do not have administrators of the software.

Furthermore, R6 also explains that public sector has been learning fast and municipalities are good at the action of decision making. Decision making is a tradition which lies within the public sector and does not look the same as in the private sector. R6 explains that a municipality's base has always been democracy, which leads to natural processes for decision making. This is beneficial for a municipality's actual use of a BI software, since Watson and Wixom (2007) argue that analysis and decision making must be a part of the organization culture in order for BI to be successful. They also argue that the use of BI might involve new people in

the decision making, but this challenge is most likely also an easy task for municipalities because of the aforementioned statements by R6.

Looking at the concept of e-government, there is a clear pattern of municipalities relying on computer-based systems, as explained by Zeb et al. (2012), and findings show that BI is included here. Regarding the three sectors of e-government, government-to-government (G2G), government-to-business (G2B) and government-to-citizen (G2C), the findings show that BI is mostly used internally within the municipality and to compare your own municipality with others. This is in line with the statement from Atkinson & Ulevich (2000) saying that G2G is the backbone of e-government.

However, the results also show that BI is being used to a small extent in the G2C matter. According to Seifert (2003), G2C is historically perceived as the main goal of e-government, even though this is not the case regarding BI in Swedish municipalities. Regarding BI, R5 explains that they present some information from the BI software for the citizens to compare schools, retirement homes, home care, preschools, and so on. This is a way for citizens to measure the quality of different municipalities. However, a challenge with this is explained by R2, saying that there is a difference in the licence cost. Whenever you want to publish anything from your BI software, it becomes more expensive and as mentioned before, municipalities have to keep the costs down because of the laws and regulations. Concerning G2B, the findings do not show any particular value of BI in this sector of e-government.

Based on above clarifications, the potential of BI in governments as described by Chen et al. (2012) is not in line with the reality of the use in Swedish municipalities. Chen et al. (2012) claim that BI leverage opportunities for political matters. According to the findings, municipalities do not use BI for political matters in the way as Chen et al. (2012) described. BI is mainly used internally to do tasks such as motivate where money is being spent and how budgeting is going. This could however also be seen as indicators to whether the municipality is acting according to what was promised in the election.

In conclusion, the findings show that the value added is similar to private companies. However, municipalities are more regulated by laws which make some parts of the use exclusive for municipalities, such as the requirement of storing grades from school. This is in line with Seifert's (2003) argument that laws and regulations encourage software implementations in governments. Respondents also claim that there is a focus on the things that have to be done according to these laws.

Moreover, an issue with being regulated by laws is brought up by R6, who explains that BI vendors do not consider these laws when developing the products. Instead, the products are customized to have a more entrepreneurial ideal that suits the private sector, and this could be problematic when municipalities use the softwares. This issue is probably a reason to why R2 believes that the future will provide more tools that are developed exclusively for municipalities.

By once again looking back to municipalities' role in society, it is explained that a municipality's main objective is to ensure local welfare and interests by using tax money paid by citizens (Regeringskansliet, 2015). The use of BI in a municipality can be considered to be in line with this statement since the goal with BI is to make the organization more efficient, save time by removing manual labour and to reduce costs. This will eventually spare executives

time to focus on their main tasks which in different aspects are ensuring local welfare and interests.

5.3 Future use of BI in municipalities

The attitude towards BI in municipalities is good according to the findings and the use of the software is developed continuously. However, we also tried to evaluate room for improvements and the future use of BI in municipalities to explore where this ongoing path will lead. All respondents agree upon the fact that there is always more potential in the use of BI. It is a question about prioritizing and each municipality have to determine what is most important for them.

The common view by the BI-experts is that BI will have a wider spread in the future and municipalities will use it to a bigger extent in more areas than HR and finance. R2 also believe that there will be tools that are suited for municipalities in particular, which as mentioned before can be connected with the challenges explained by R6, saying that most of today's tools are customized for private companies.

The findings also show that two municipalities are using a combination of QlikView and another software called Stratsys. R7 explains that QlikView is used for analysing and Stratsys is used for commenting. This can be improved by instead having BI software that allows better functions for inputs and comments. This is also a statement which R5 agrees upon. R5 explains that today's software is good at gathering, counting, matching and making sense of data, but there is room for improvement regarding the reports and adding text.

We also have the reason to believe that more can be done in the area of government-to-citizens. Chen et al. (2012) explain about the potential of analysing the content of public comments. By analysing public comments by citizens, municipalities can work better and more in line with what the citizens say and want. This could eventually improve the interaction with citizens and improve municipalities' position and reputation.

6 Conclusion

This research is done with the purpose to illustrate the path that Swedish municipalities take from adopting BI to actual use of BI, as well as to find out where BI software add value. In order to fulfil those purposes, we identified two major phases. The first phase is the process where BI is being adopted in municipalities and the second one is when BI is already implemented and being used by the users in municipalities. By interviewing three BI-experts from different companies and three BI-administrators from three different municipalities, we are able to answer our research questions that directly correlate with the aforementioned research purposes. Our first research question is stated as,

1) What path do Swedish municipalities take from adopting BI to actual use of BI?

Our findings show that in order to make actual use of BI, municipalities have several obstacles in their way. Historically, it has to be admitted that municipalities are late in embracing BI compared to companies in private sector. Swedish municipalities are however very good in adopting BI as a result of the country being hi-tech. When municipalities started to welcome BI, the first challenge to appear is the law called “lagen om offentlig upphandling” that restrict municipalities from getting the best solution possible. This law makes municipalities to pick the cheapest alternative and also delays the time span of the procurement.

During the procurement process itself, another technical problem that could slow down the process is the chain of intermediaries. Once the procurement is finished, the municipalities have to make sure that the users are ready to use the systems. Even though there are always some resistant people, the general attitude among the users is good and the municipalities strive to also increase the acceptance. The results also show that the actual use is good in municipalities due to the fact that decision making is a tradition which lies within the public sector. Lastly, municipalities are very progressive in developing their software and making improvements in order to maximize the benefits they can obtain from the software. In order to do this, having the right person as an administrator is crucial. Furthermore, the second research question is stated as,

2) Where does BI software add value to municipalities in Sweden?

It is clear that, based on our findings, finance and HR are subjects in municipalities being influenced the most by BI software. The reason behind this are the facts that municipalities are tax-funded and the number of employees within municipalities is huge. Findings also show that the software is used frequently in elderly care and school, as well as for charity matters. With that being said, other subjects within municipalities varies in terms of BI implementation, depending on the need and vision of each municipality. However, Swedish municipalities are not very different compared to the private sector when looking at the value added, with the exception of a certain focus on tasks that has to be done because of laws and regulations.

It is clear that different municipalities are using the software in different ways and the software provides different value. There is no pattern of BI adding more value to a bigger municipality than a smaller one. The value added is a question about what the municipality prioritizes, how visionary the executives are and how big the interest is. It can be concluded that Swedish municipalities are good at exploiting BI, and with a good network of skill transferring between municipalities they help each other to improve and develop their software.

In conclusion, there is always room for improvements and municipalities can always add more value to their organization with BI software. Respondents believe that BI will continue to develop and spread to more parts of the municipal organization. The administrators at the municipalities also think there is room for improvements in the area of inputting data and making comments to reports. However, the overall perception of BI usage in municipalities are that executives find the tools very useful, Sweden is exceptionally good in adopting the software and the value added is considered to be very crucial for the organization.

6.1 Further research

An interesting topic to develop further on this subject is how to better integrate comments and inputs to reports in the BI software. Findings show that BI software is designed to be very easy and by adding more functions it will naturally make the tools more advanced and harder to use. However, vendors and consultants should consider this feedback and evaluate how this can be done. Moreover, vendors also need to adapt more to public sector in general since the findings show that most softwares are customized for private sector.

In addition, further research may also determine all success factors to why Swedish municipalities is at the forefront of using BI and why the problems issued in the literature review did not apply on Swedish municipalities. Public sector has a big need of BI software, and determining success factors of how BI can be adopted in the public sector properly can help other governmental institutions in implementing the software. It would also be interesting to quantitatively apply TAM to users of all municipalities in Sweden to evaluate how the actual use is perceived as a whole.

Appendix 1 - Interview guide (BI-expert)

Initial Questions	
Q1	Describe shortly your organization and how you work.
Q2	What are your work experience, your current role and your relation to BI?
Main Questions	
<i>The value of BI in municipalities</i>	
Q3	What are the most crucial reasons for implementing BI software at a municipality?
Q4	In what areas of a municipality does BI add most value and why? Who are the users and stakeholders?
Q5	What are the differences between the values added from BI to municipalities compared to other types of organizations? What are exclusive for municipalities?
<i>Challenges when working with municipalities</i>	
Q6	What are the main challenges of implementing BI at a municipality?
Q7	Are there any common barriers or issues with acceptance when implementing BI in municipalities? How are they handled?
Q8	Could there be any issues implementing BI because of the size of a municipality and the numbers of employees?
Q9	What is your opinion about stakeholders' knowledge in the BI field at municipalities?
Q10	How do you work to educate users at the municipality to use the software properly?
Q11	Do you think municipalities are slower in adapting to BI than companies in the private sector?
Q12	Do you believe that Swedish municipalities use BI software to its full potential or are there room for improvements? I.e. Is there a gap between what can be done with BI and how the municipalities are using the software?
Ending Questions	
Q13	How do you think the future use of BI in municipalities will look? Are you seeing any trends or shifts regarding the use of BI?
Q14	Is there anything you would like to add to the subject of BI in municipalities?

Appendix 2 - Interview guide (BI-administrator)

Initial Questions	
Q1	Describe shortly your organization and how you work.
Q2	What are your work experience, your current role and your relation to BI?
Main Questions	
<i>The value of BI in municipalities</i>	
Q3	For how long has your BI software been in place?
Q4	Who are the users of the software? I.e. Is it only used by certain people or departments?
Q5	What do you want to achieve from the use of BI software?
Q6	In what areas of the municipality does BI add most value and why?
<i>The use of BI software in municipalities</i>	
Q7	How is the attitude towards using the software at the municipality?
Q8	What is your opinion about how useful the software is for the users?
Q9	What are the challenges of adopting BI at a municipality?
Q10	How do you work with educating the users of the software?
Q11	Do the users find the software easy to work with?
Q12	How has the use of the software evolved over the years? What progress have you done?
Q13	What improvements do you think can be done in the use of BI at your municipality?
Ending Questions	
Q14	How do you think the future use of BI in municipalities will look? Are you seeing any trend or shift regarding the use of BI?
Q15	Is there anything you would like to add to the subject of BI in municipalities?

Appendix 3 - Interview transcript Qlik

Interview with: Qlik

Interview date: 20th of April, 2016

Participants: Konstantinos Mertzianis (R1), Hafidz Alhaq Fatih (HA)

Respondents: R1

Interviewer: HA

Interview type: Face-To-Face

Interview duration: 39 minutes

Transcribed by: HA

Transcription date: 20th of April, 2016

Line	Speaking	Text
1	HA	<i>To begin with, I would like you to describe shortly about your organization and how you work in the organization.</i>
2	R1	So, my current role is quality analyst at R&D organization of Qlik, specifically what I do is I am responsible for the product quality in terms of features to bugs to everything regarding customer verification, customer validation of our own product. That's my current role. Previous role, I started as presales consultant, working mostly with customers then I moved on, I moved away from the field as we call it and went back to R&D where I was internal BI developer or Qlik developer for a couple of years, and now or last one year I am working as quality analyst.
3	HA	<i>So, basically you...</i>
4	R1	My work experience in the BI sector is around seven to eight years.
5	HA	<i>Covering both technical and...</i>
6	R1	Yes, technical and business challenges and problems.
7	HA	<i>So that also covers the second question: your experience, your current role, and your relation to BI. Maybe you can add more about your relation to BI?</i>
8	R1	So, yeah mostly my entire career, I mean, my first job was actually developer on Java, I was developing applications and using Java for one year. And after that actually I moved to the world of business intelli-

		gence or analytics. It's mainly my career. My entire career revolves around BI, so I am very much related to the context.
9	HA	<i>That's good.</i>
10	R1	Yes.
11	HA	<i>Ok then we move to the main questions, first one regarding the value of BI in municipalities. What are the most crucial reasons when implementing BI software?</i>
12	R1	I checked this question before. I can't discriminate BI between municipality or organization or bank, whatever it is. For me it's the same value, it's basically one topic which is problems that can be solved with data that the organization, living organization generates on daily basis, right?
13	HA	<i>Yeah.</i>
14	R1	So, a municipality generates data, what type of data is that? It can be all sort of human resources, it can be data regarding people living in the municipality, data regarding legislations, laws around workflow about the municipality. So it can be all sorts of thing, depending on what questions the people in the municipality want to answer. That's why we implement BI. BI is basically a tool or methodology, whatever you name it for getting a better understanding of what's happening with your data. And by getting that understanding, you can actually find easier answers to the questions that are bothering you, or at the same time make decisions about things. So that's not something only around municipalities. It's the same thing with every customer, it can be logistics, it can be software company, it can be clothing industry, whatever that is. It can be telecoms, they all have questions they need to answer and the answers for the questions derived from the data. Not the 100% answer but at least a hint to what they've asked. I know if you understood what I said.
15	HA	<i>So we can go to the next question. In what areas of a municipality that BI adds most value and why? Who are the users and stakeholders?</i>
16	R1	As I've seen it, that again depends from municipality to municipality, you cannot generalize, like, all the projects that we had with municipalities, this is the area where the most value was given to. So, one of the areas that I've seen has been a lot is issues about human resources and how to allocate human resources within the municipality. That was one of the area that, to be honest with you, I cannot generalize that. Every municipality have their own business problem that they want to tackle. And that's something you will see as well if you go to Jonkoping kommun or Lunds kommun. Or if you go to smaller kommun, every kommun have their own difficulty that they want to tackle. It's not the same at each one of them. The most common one though is things dealing

		with human resources and how do we understand how many people we are occupying at this level, what are their needs and so on. The users and the stakeholders here are basically the business users of the major systems that generate data. So, for example, if, I don't know, Lunds kommun has a system for generating or handling filing human resource data, the stakeholder for BI implementation will be the person on top of that.
17	HA	<i>And then, what are the differences between the values added from BI to municipalities compared to other types of organization? Is there anything exclusive one from municipalities?</i>
18	R1	No, the only difference is that municipalities can be more, for example, other types of organizations, specifically business competitors, it has that business factor. We have done work with municipalities that can be more humanistic, meaning a charity. We want to see, for example, we have a project with specific kommuns, I cannot name the municipalities. We have a project, for example, where they wanted to measure the amount of charity funds that were given in from the residents of the municipality for a specific cause, and they wanted to do a BI application around that data, from which areas in the municipality the most funds came in, what type of people were they, were they families, were they students, and so on. So, for that purpose, that was a charity fund or a charity project, so that's a big differentiation from a project if we go to Telia for example, or if we go to Sony Ericsson. And this one we did, for example, as well as part of our CSR. So, that's a differentiator. So, municipalities have this CSR that we also share as well. So, we give for free our product, or we give for free our consulting, using our prod to solve problems for charity purposes, or for issues that the municipality would not gain money from, but will have the people, so from more humanistic purpose. You understand?
19	HA	<i>Yes. We move to the next question. Then about the challenges when working with municipalities.</i>
20	R1	Yes, the biggest challenge I've ever seen, I haven't worked with many municipalities, the one that I have worked is very unstructured way of storing their data and lack of processes when it comes to that as well. And that's a big challenge because when you have anarchy in that perspective, it is a big challenge for someone to dig out and see the problems in the data, then analyse, verify and validate the data with the municipality itself and create a BI application.
21	HA	<i>Ok, so that's the main challenge. Then are there any common barriers or issues with acceptance when implementing BI municipalities? And if there are, how are they handled?</i>
22	R1	I don't understand the question, what do you mean by issues or common barriers? Like problems?

23	HA	<i>Yeah.</i>
24	R1	Well, the main common factor here is that each municipality handles their data, like every organization handles their data in a different way, or generates data in different way, which is basically the source for a BI application or BI project implementation. So, that's actually a common issue within any BI projects. Just add more or less, you know, the business aspect behind it, how to tackle, how the data is generated and the procs that this kommun and that kommun uses to generate the data. That's quite cumbersome. And it is the same challenge in each kommun, but at the same time it is something that has to be solved. Yes, that's a common issue if you ask me. How is it handled? Well, it gets handled basically by communicating, trying to communicate with the business owners which in this case are mainly the people responsible for the project from the municipality side. So, that's how we handle it.
25	HA	<i>And if you look to these problems, could you identify if there any issues when implementing BI because of maybe the factors of the size of municipality or the number of employees or?</i>
26	R1	Well, the size can be a good factor actually. Because the bigger the municipality, the better actually the systems of storing the data are. So usually when you go to smaller municipality, there is more possibility of getting unstructured data like data living in excel file. When we go to bigger municipality, because of the size, they also need more structured process and organized method to generate their data. So, the bigger the better I think. It's like if we go to small kommun, they usually don't have the need to support a lot of data. So they don't use like a process or a system that handles that. For example, I have this program that basically you have to go in and apply form and fill in the data, that's how you generate data, like an ERP system for the municipality. The smaller kommuns usually don't have that because there is not such a big need but then again those kommuns are not in need of BI as well. And the bigger kommuns have systems like that, or can support because there is a need. You understand it?
27	HA	<i>Yes. So, the bigger the size, the more aware or understand they to their problem.</i>
28	R1	The bigger the size makes you aware of a need to have system to handle the data, not a BI, let's say an ERP system, a resource planning system, or issue tackling system, as we call it like ticketing system. So for example, someone calls a kommun and finds a complain about a road or something. That complain gets stored into a system. In the smaller kommun that might happen, I've never had such an example, I've never been to smaller kommun, I'm just guessing now, don't take my word for it, but in smaller kommun, I assume that could happen also in an excel file. So for example, person that's called accepts the call and says ok notes it down in note. In the bigger kommun, of course they will

		have a system to store that information or that data actually.
29	HA	<i>Then the bigger the size, the bigger the problem, and the more advanced they handle it.</i>
30	R1	Yes, it's the same as companies, you have a small company with 5 employees, they don't need an ERP to handle the income of data. When it rose, there is more demand then they get some other way to store their data.
31	HA	<i>And then what is your opinion about stakeholders' knowledge in the BI field at municipalities?</i>
32	R1	The stakeholders meaning the people from the municipality itself?
33	HA	<i>Yes.</i>
34	R1	Well, they are usually not aware of the magic. That's the nice part of it. So, whenever you implement a BI solution, that lies not only for municipalities generally, in all organizations, the moment they see the first dashboard, representing business aspects that they are aware of, but in documented data wise way, you then get the feeling of surprise, "Wow! I didn't know that this was happening." Yes, I could think that during that month we had dropped in that perspective, but now it's justified by the data as well. This is amazing. These are the reactions we get.
35	HA	<i>Ok, and then how do you work to educate the users at the municipality to use the software properly? You said that there were some wow feelings from them meaning that...</i>
36	R1	Well, that's the funny thing, that's the easy thing with QlikView, right? So the moment they understand the power of clicking, that's why it's called Qlik, and the power of associations, so the power for Qlik is basically select the value and you see based on that value what are the possible selections, how is this thing that I'm clicking on associated with other things, and not only that, but you can also see at the same time what is not associated, the excluded values. So, the moment they grasp that, like the clicking and checking how their graphs change depending on that click, they understand how to use the tool. And that makes it not that hard, it's very easy to educate them. The hard part is educating them not to create bad data. That's the hard part.
37	HA	<i>So there is a connection between the hard part and the first challenge you mentioned before?</i>
38	R1	For example, when you notice in a field or a column in the database which is basically called name, and you expect to see a bunch of names there and suddenly you see a number, that's bad. Something happens bad in the process that generates data, right? So, that's usually the hard thing to fix. And it's not something the BI solution will fix for you. The

		BI solution will highlight it; the way you fix it is more process problem. So you have to fix that process that generated that bad. Why did that person input a number instead of string? And that's usually the hard thing to fix. It's not the other like data wise or you know I need a different chart, that's not hard.
39	HA	<i>Ok so it's more in the process before main BI part?</i>
40	R1	Exactly.
41	HA	<i>Ok, the next question, do you think municipalities are slower in adapting to BI than companies in the private sector?</i>
42	R1	Yes. They are quite slower. It depends on the country, it depends on the technical people of the municipality if they are hi-tech people then they adapt faster, if they're not, they do not even consider it. The organizations or the companies out there, not municipalities, they have a need for it because they see huge value in terms of investment. So I invest that much money to BI, I get this much back because it helps me do things better. So, municipalities are not driven in that perspective, most of them, but there are many cases and most of them are our customers of course that have proven otherwise and of course here a major factor is the country and how hi-tech that country is. So, it's different if you go to Sweden and implement this, and you will see a bigger ratio of municipalities implementing BI solutions than going for example, South Africa or I don't know, somewhere, Bolivia, or a third world country that's not so hi-tech in terms of technological knowledge of their employees. So that's a big factor.
43	HA	<i>So if we take Sweden, as the comparison to companies within Sweden as well.</i>
44	R1	No, it's actually really good ratio. For example, the implementation of BI solutions in Swedish municipalities is quite good and the employees accept it. It's amazing. Even Swedish police uses BI: QlikView, which is in a similar aspect.
45	HA	<i>You said it's quite good and not far in comparison, does that mean they're still slower at some point, in adopting BI, compared to companies in private sector?</i>
46	R1	No, they're not that slow. I would say they're not at the same level but close enough.
47	HA	<i>Close enough?</i>
48	R1	Yes, but again, the aspect here, you are talking about only a specific country, I don't know if your case study wants to generalize this worldwide on municipalities implementing BI. That was my answer to start with. In Sweden, it's actually quite good.

49	HA	<i>Actually our delimitation is within Sweden.</i>
50	R1	Ah, within Sweden? Ok, we have not only our customers, but I think other municipalities might pick other vendor. They're very open to BI and adopting BI solutions.
51	HA	<i>So again, it's not a big difference?</i>
52	R1	No, not a big difference.
53	HA	<i>Do you believe that Swedish municipalities use BI software to its full potential or are there room for improvements? I.e. Is there a gap between what can be done with BI and how the municipalities are using the software?</i>
54	R1	This question, I cannot answer, to be honest, because I cannot judge. Of course there is always room for improvement. You can never have a perfect solution. But, what is needed to be done, that's up to them. We can show to them what you can do. The acting or decision like, "Ok, I want to do that, this and that", it's up to them. So I cannot answer you what is the gap between what can be done with BI and how municipalities are using the software. We propose a solution; they start using it. Now, if they're using it in a good manner, that's up to them.
55	HA	<i>But you always try to make them understand its full potential, right?</i>
56	R1	What we try to make them see is understand the data. So the moment they understand it, they can understand how to work with the information coming from that. Hence, they grab full potential of what they can do. After that, it's up to them. So, we basically give them a solution to the problem that they have proposed and if we can give more to that, like "You know what? We did this plus this, but you didn't ask." We did that, but finding the gap what they can do potentially, that's up to them. Usually it happens like that. For example, they're going, "Ok, I want to see this specific thing." Then you show them the entire picture. And they realize, "Oh, I didn't see I can see that this way." At that time, they already gained part of that gap, meaning, "Now I know I wanted to solve this, but you showed me something I didn't know. Hence, I would like to investigate in that as well and try to solve it."
57	HA	<i>With the time being, maybe you find some kind of complaints after you gave them solution and then they find something they don't really understand in the process, then you give them feedback telling them that our solution is capable of doing that.</i>
58	R1	What we give them is like we exceed their expectations in terms of providing them a full picture about their data. Now of course we answer their initial questions, "I want to use Qlik to have better understanding of my data". Now while they discover things, by using the product, they say, "Ok, I didn't know about this, I actually need to bring in a system

		to control this better, I need to do this, this and this to fix it." By doing that, they start bringing in more data which might lead to us coming back in again and say, "Ok, you want us to attach that data mart, now that you are supporting for that process to help me answer more questions." That, we do. But the end solution is that we give them a full picture but what they do the full picture is up to them. Some of them might not understand it, some of them might just want the answer to get specific report, 1, 2, 3. In that period, they don't care about the rest. There are others too that are triggered by the rest and say "Wow, I didn't know I can see that visual."
59	HA	<i>So they did do some follow-up questions?</i>
60	R1	Yes, basically what we have is store of a validation or verification of what we deliver. So the follow-up questions are usually, "I didn't know I could see that, would you dig in more into that, now I have new question." It's more agile, so it's more on-the-go process. It's not like project that have phase and it ends. That's the nice thing about Qlik. So you get the first phase, the user uses it and understands and sees more problems and more questions, then you go to the second iteration and so on. In technical terms, it's a more agile way of helping the customer than going in as a project, I have this start date, and this end date. It doesn't work like that. It's more iterative.
61	HA	<i>How do you think the future use of BI in municipalities will look? Are you seeing any trends or shifts?</i>
62	R1	Yeah, I've seen more and more municipalities going that way and specifically powering more the business users. For example, the business users navigate themselves more within the data of living within the municipality, when they navigate themselves within that data, they can take decisions or create analytics in their own. That's the future that I see, more heading toward the business users and giving more power to that simple employee behind that computer that usually do all the thing or used to do logistics in regards the municipality now, he can also interact more easy with the data because they understand how to interact with it, with his own understandings.
63	HA	<i>Is there anything you'd like to add to the subject of BI in municipalities?</i>
64	R1	The thing that I would like to add is what I told you, since municipality is public organization, it depends on the country and how hi-tech is that area. For example, is the workforce of the municipality aged between 20-40 years old, or is it mostly above 50? Then you will see a trend, not so good with BI, usually younger generations that are within municipality or org that have a need or see value within BI projects or solutions. And of course that thing differs from a country to country and from economical perspective. Because these projects, for example, some of them might be for charity, so they're not expensive or free. But some of them are really expensive. And when some unit comes to some-

		<p>thing that might cost money, it's quite hard to decide upon. Again, it differs from an environment to environment. If an environment can support these things, technological solutions like BI then it's good. If it cannot, it's not bad, but it cannot. This is good about Sweden, it's more hi-tech country in that perspective. It's also how you educate your people working in the municipality. If the person working in the municipality has never interacted with computer because of various reasons, then BI solution won't work. It might work if you open up his eyes, but I don't think it's quite hard to go that way towards such environment.</p>
--	--	---

Appendix 4 - Interview transcript Acando

Interview with: Company Acando

Interview date: 20th of April, 2016

Participants: Senior BI-Consultant (R2), Public Sector BI-Consultant (R3), Tobias Andersson (TA)

Respondents: R2, R3

Interviewer: TA

Interview type: Face-To-Face

Interview duration: 25 minutes

Transcribed by: TA

Transcription date: 20th of April, 2016

Line	Speaking	Text
1	TA	<i>Beskriv ert företag och vad ni jobbar med.</i>
2	R3	Acando är ju ett konsultbolag som verkar inom många områden. Uppdelat här nere på tre områden där vi har IT-management consulting och management consulting inom ett område. Dessa syftar inte direkt till beslutsstöd, utan snarare processerna runt ett beslutsstöd. Vi har ECS som sysslar med affärssystem, SAP, Microsoft Dynamics, och så vidare. Där finns faktiskt ett SAP beslutsstöd också. Sedan har vi vårt DCS, Digital Consulting & Solutions där vi har organiserat vårt beslutsstödsarbete. Här är R2 ansvarig.
3	R2	Analytics som vi kallar det inom Acando finns grupperat på alla fem kontor. Största grupperingen är i Göteborg med cirka 40 konsulter inom BI. Framförallt Microsoft, men även Qlik. Detta är de två största verktygen vi jobbar med. Sedan finns vi då i Malmö, Stockholm, Västerås, Falun. Det är allt från att bygga datalager till att bara göra rapporter till slutanvändaren. Så vi jobbar både i linjeroller och går ut i projekt och gör insatser på ett helt datalager eller på enstaka rapporter och förbättringar på befintliga.
4	Q2	<i>Vad är er roll och er relation till BI? Er bakgrund?</i>
5	R2	Jag ansvarar för analytics-grupperingen här i Malmö och jag har jobbat med framförallt Qlik sedan 2006. QlikView började jag utveckla i. Jag har jobbat på Qlik, både på R&D och på IT inom dessa frågorna. Det blev rent naturligt att jag landade här när Acando expanderade inom deras BI-

		verksamhet i Malmö. Jag både levererar och ser till att vi har rätt bemanning på uppdragen. Jag ser till att vi får in rätt kompetens när vi rekryterar och ser att vi fokuserar på rätt saker inom analytics helt enkelt.
6	R3	Jag har en bakgrund inom IT-management och revision så jag ligger mer i det spåret. Jag ansvarar för vår affär inom offentlig sektor i Malmö.
7	TA	<i>Vad är de viktigaste anledningarna till att implementera BI i kommunen?</i>
8	R2	Du kan följa upp i princip allting, från ekonomi till invånare, attitydsenkäter och allt möjligt. Det är egentligen för att du ska få en uppfattning om hur kommunen går och vilket skede den befinner sig i, den ekonomiska statusen, hur mår invånarna, hur många turister får vi in under exempelvis sommarhalvåret. Det kan vara allt möjligt. Men ekonomisk uppföljning är lika viktigt för kommunala verksamheten som för privata företag. Det är där man ofta landar.
9	TA	<i>Så det är mest den ekonomiska biten som är viktig?</i>
10	R2	Ja, det är ofta det som triggar igång dem när man pratar om integration med andra system. De vill på ett lätt sätt kunna se ekonomisiffrorna i intranätet.
11	TA	<i>Vilka är användarna och själva intressenterna hos kommunen?</i>
12	R2	Det kan vara lite olika. Det beror på hur implementation ser ut. Förvaltningsledare skulle jag vilja säga är viktiga, så de kan följa upp hur förvaltningen går. Sedan kan det vara olika rapporter till olika intressenter. Men framförallt förvaltningsledare som följer upp hur det går.
13	R3	Med förvaltningsledare menar R2 chefsledare i den kommunala organisationerna. Allt från kommunchef och neråt i organisationen där man har behov av att följa upp olika delar av verksamheten.
14	TA	<i>Så intressenterna finns mest på ledningsnivå inom kommunen?</i>
15	R3	Både ja och nej. Jag tror att ledningen alltid har behov av att följa upp sin verksamhet. Sedan finns det specifika appar som man använder i givna sammanhang där man har BI som en del i arbetet för att man behöver en viss information för att lösa en uppgift. Då kan det finnas även på andra nivåer.
16	R2	De flesta system har egen inbyggd rapportering. Men ska du få någon aggregerad bild måste du samla in mer data och lyfta upp det några nivåer. Då är det oftast någon i en chefsbefattning som är intresserad av att se det.
17	TA	<i>Vad är den största skillnaden mellan privata sektorn och offentliga sektorn? Vad är exklusivt för en kommun?</i>
18	R3	Upphandlingsbiten är egentligen den största frågan som jag ser det. Det är olika vägar in.

19	TA	<i>Så kommunen är mer påverkad av lagar och bestämmelser?</i>
20	R3	Kommuner lyder under lagen om offentlig upphandling. Detta innebär att det finns olika gränser, eller upp till 505000 ungefär får man lov att direktupphandla. Däröver måste man gå ut till någon form av offentlig upphandling. Om du inte redan har ett avtal, men då har du redan en offentlig upphandling. Detta gör att om en kommun, eller offentlig myndighet, ska installera BI i sin verksamhet måste de göra en offentlig upphandling om de inte klarar sig under denna gräns.
21	R2	Och det gör du sällan.
22	R3	Det gör att ledtiderna blir mycket längre. Det är inte heller givet att de kan välja den leverantör som är bäst.
23	TA	<i>Vi har glidit in lite på nästa tema redan. Vilka är de främsta utmaningarna när man implementerar BI i en kommun?</i>
24	R2	Det finns ju stora skillnader och stora likheter i hur en kommun organiserar sig jämfört med ett privat företag. Det som särpräglar en kommunal verksamhet är att det ofta är vattentäta skott mellan olika enheter. Det vill säga att exempelvis skola jobbar fristående från vård och omsorg. Det är inte helt säkert att de har någon interaktion eller förståelse för varandras verksamhet. Sitter du på motsvarande mellanchefs nivå i ett privat företag måste du ändå ha insyn i vad dina chefskollegor gör för annars blir det svårt att interagera.
25	R3	En förlängning på det R2 säger är att idag sysslar vi med renodlade bolag ganska mycket. Håller du på och producerar asfalt som ett exempel så har du inte produktion av vårdtjänster inom samma bolag. Det är rätt naturligt skilt. De är olika lagstyrda områden. Det gör att en kommun är ett klassiskt konglomerat.
26	R2	Tittar du ända ner på källdatan så kan det vara svårt att hitta någon som har en övergripande föreståelse för hur källdatan hänger ihop, för att du ska kunna presentera den på ett gemensamt datalager på en aggregerad datanivå. Det gäller att identifiera rätt personer på rätt nivåer och sedan får vi bygga en bild av hur det ska se ut.
27	TA	<i>Är där några problem med acceptans av ny BI-teknologi i kommunen? Om där är några vanliga barriärer som ni har upplevt?</i>
28	R2	Jag skulle vilja säga att chefshierarkin inom kommunen är ganska tydlig. När någon har bestämt sig att ett system ska implementeras så får de andra acceptera det. Där finns inte lika mycket svängrum som i privata företag där du tillåts testa andra system för att sen kunna bevisa för den närmsta ledningen att detta fungerar lika bra eller bättre. Du är nog mer nedlöst i kommunen när det kommer till de bitarna.
29	TA	<i>Finns det några problem med storleken på en kommun och antalet</i>

		<i>anställda? Jag tänker på det ni sa tidigare om de olika enheterna inom en kommun, blir det några problem med de olika enheterna eller implementeras BI ofta i en specifik enhet?</i>
30	R2	Det kan mycket väl vara så att det implementeras i olika enheter, men då får du inte den övergripande bilden. Helst vill vi att det ska vara någon som sitter tillräckligt högt upp i organisationen som beslutar att detta ska implementeras för att samla upp all data dit och kunna utnyttja kraften i datan. Tittar man på en produkt som QlikView så är den insåld mer på ekonomiavdelningar och försäljningsavdelningar. Så du kan ha olika separata installationer av samma produkt på samma företag. Detta är eftersom de inte pratar med varandra och har sin egna låda av verktyg.
31	TA	<i>Hur mycket kunskap har intressenter hos kommunen om BI? Kan de lika mycket som intressenter inom privat sektor?</i>
32	R2	Det är väldigt individuellt. Det har att göra med intresset hos användarna.
33	R3	Egentligen har det att göra med den sourcingstrategi man valt. Ska vi sourca det här internt eller ska vi sourca det externt. Det är egentligen det som avgör.
34	R2	Det går alltid att hitta dem som avskyr produkten oavsett vad vi gör, så finns det alltid någon som ogillar produkten. Likväl finns det även "champions" ute i organisationen som tycker det är det bästa som skivat bröd. Då gäller det att identifiera dessa, klappa de på ryggen och se till att de sprider denna stämningen.
35	TA	<i>Arbetar ni något med att utbilda användarna i er produkt? Märker ni att kommuner behöver mer utbildning än privata företag?</i>
36	R2	Vi säljer utbildningspaket. Både på produktnivå och mer specifikt på rapportnivå. Det ser olika ut beroende på kundens behov. Här handlar det igen om intresset hos användaren. Det enda som är unikt för en kommunal verksamhet är att ibland kan du bli omplacerad ett helt annat sätt jämfört med i ett privat företag. Exempelvis kan en gammal sjuksköterska hamna på kansliet nånstans och har egentligen ingen bakgrund inom IT.
37	TA	<i>Är kommunen långsammare med att anpassa sig till en BI-lösning än privat sektor?</i>
38	R2	Ja, de är långsammare med att komma till skott.
39	R3	Det är upphandlingen som tar tid. Om du går till ett privat bolag och en kommun idag och startar en dialog, så kommer en implementation nås mycket fortare i ett privat bolag eftersom de har en annan upphandlingsprocess. Där är primärt skillnaden.
40	TA	<i>Betyder detta att kommuner inte har kommit lika långt inom implementation av BI som privata företag?</i>

41	R2	Nej, jag tycker generellt sätt inte. Tittar vi på Malmö stad är de väldigt långt i sin process med beslutsstöd. Det som skiljer är att när de ska fatta ett beslut så tar det längre tid. Om du tar ett privat företag och går ut i en upphandling så diskuterar du ofta med den som ska köpa in systemet. Hos kommunen är det inte säkert att han eller hon har beslutsrätt, utan representerar bara den specifika förvaltningen eller enheten.
42	R3	Ifall vi tittar på spridningen av BI-produkter så har alla kommuner som jag känner till någon form av BI-produkt. Jag tror att alla kommunala bolag arbetar med någon form av BI. Sedan kan man alltid diskutera omfattningen av användning. Alla som vi känner till har en BI-produkt. Det man ofta missar i såna här diskussioner är storleken. Ifall vi ser till respektive given ort, så är faktiskt kommunen den största arbetsgivaren. Exempelvis Malmö har över 20000 anställda på kommunen. Det finns ingen annan arbetsgivare som är över 20000. Det är sjukhuset i så fall som har en 6000-8000. Det är det närmsta som kommer därefter. I respektive given ort är kommunen därför ganska stora spelare. Det är något man bör ha med sig. Man pratar ofta om internationella företag med 100000 anställda, men deras största siter är oftast mindre än en kommun.
43	R2	Och lyfter du blicken en nivå upp, så är oftast regionen den största arbetsgivaren. Både i skåne och västra götaland.
44	R3	Ja, och det skapar komplexitet. Region skåne har väl världens största QlikView-lösning?
45	R2	Ja, det ryktas om det. Jag har hört att det stämmer i antalet användarlicenser.
46	TA	<i>Tror ni det finns mer potential med BI inom kommunen jämfört med hur det används idag? Finns det ett gap mellan vad som kan göras och vad som faktiskt görs?</i>
47	R2	Absolut. De utnyttjar inte den fulla potentialen. Där är mognadsgraden så klart också olika från kommun till kommun. Men där finns fler områden där kommunen skulle kunna använda BI inom. Sedan är det väl en fråga om hur de prioriterar sin budget, hur visionära respektive områdeschef eller förvaltningschef är. Vad de vill visualisera inom BI.
48	TA	<i>Vilka områden tror du det finns mest potential i? Och var tycker du kommunen har mognat mest?</i>
49	R2	Bra fråga. Det finns så mycket. Ekonomi har kommit längst. Där är de nästan tvingade att ha en bra ekonomisk uppställning på en aggregerad nivå. Men det finns mycket mer att göra. Exempelvis medarbetarundersökningar inom kommunen. Vissa gör detta redan, men inte alla. Attitydundersökningar bland invånare.
50	R3	Det finns nog en mängd område där det kan utvecklas. Men det är baserat på deras mognad.

51	TA	<i>Hur vanligt är det att man använder BI mellan kommun och invånare? Eller är det mer vanligt internt i kommunen?</i>
52	R2	Region skåne har börjat med en extern portal där regioninvånare kan surfa in på deras webb och få direkt tillgång till vissa rapporter i deras BI-system. De är rätt långt fram. Kommuner har inte riktigt kommit lika långt i den här regionen i alla fall. Det är återigen en fråga om hur innovationsbenägen man är och hur mycket pengar man vill investera. Så fort något ska publiceras externt behövs en helt annan licenskostnad och då är man inte låst till ett visst antal användare. Publicerar man på webben så är det svårt att kontrollera hur många som får tillgång till detta och de flesta BI-system är licensierade per användare.
53	TA	<i>Har ni någon uppfattning om hur villig kommunen är gällande att investera i ny teknologi och BI? Är det svårt för dem att få igenom ett beslut?</i>
54	R3	Jag tror egentligen att det faller tillbaka på den generella inställningen till vad man har för behov. Inser man att man har ett stort behov inom ett område så kommer man skapa sig medel för att lösa problemet. Detta är samma som inom privat sektor. Skillnaden är inte så stor där, utan det är upphandlingstiden som är olika. Då kan det vara så att upphandlingen kanske skapas på pris, vilket gör att man får välja bort saker och ting. Där kan ramen bli för tight satt och det blir en diskussion om att utöka, och nya upphandlingar sker.
55	R2	Sedan beror det på hur högt de rankar en BI-lösning jämfört med den systemspecifika rapporteringen. Ifall ett beslut har tagits att det är BI-rapporterna som gäller som rapportunderlag och inte systemrapporterna, så kommer ett helt annat läge med annan upptid, servicekrav och annat.
56	TA	<i>Hur tror ni framtiden kommer se ut med BI inom kommunen? Ser ni någon trend eller skift åt något specifikt håll?</i>
57	R2	Jag tror att vi kommer se fler verktyg som poppar upp. Nu är det bara Microsoft och Qlik i princip som kommunerna kör. Det finns andra verktyg som drar till sig uppmärksamhet, men de är inte riktigt mogna att kunna göra en installation på en kommun. Det är inte omöjligt att vi ser andra aktörer på marknaden om 5 år.
58	TA	<i>Men har Microsoft och Qlik skräddarsydda lösningar för kommuner?</i>
59	R2	Microsoft har inget färdigt datalager, utan de har verktyg där du får sätta upp datalager på egen hand. Qlik är precis likadant. Sedan finns där vissa verktyg som av olika anledningar har blivit mer populära inom vissa instanser än andra. Det är inte helt ovanligt att kommuner kör QlikView.
60	TA	<i>Är det för att Qlik är störst i Sverige?</i>
61	R2	De har haft en bra spridning i Sverige. Lokalt förankrat, en bra utveckling under många år, så det är väl därför. Sedan är det stor skillnad i teknologin

		bakom analysen i Microsoft kontra QlikView som handlar om hur du kan göra drilldown på datan. Där är ju frågan om vilket spår du vill ta.
62	TA	<i>Sista frågan. Är det något ni vill tillägga, allmänt om BI i offentlig sektor och kommunen? Något ni känner att jag har missat?</i>
63	R2	Nej, det tror jag inte.
64	R3	Nej, inte som jag kommer på
65	TA	Då känner jag mig nöjd. Tack för intervjun!

Appendix 5 - Interview transcript Hypergene

Interview with: Hypergene

Interview date: 21st of April, 2016

Participants: BI-consultant (R4), Tobias Andersson (TA), Hafidz Alhaq (HA)

Respondents: R4

Interviewer: TA, HA

Interview type: Face-To-Face

Interview duration: 27 minutes

Transcribed by: TA

Transcription date: 21st of April, 2016

Line	Speaking	Text
1	TA	<i>Describe shortly your organization and how you work.</i>
2	R4	We are a product company. We develop our own product in house. We sell and implement it to customers. That's pretty much it. The product obviously does a variety of things. It's an analytical tool. It is helping organizations with budgeting and planning financially. A big part of it to work with their business model, such as visions, KPIs and goals. It is a web based tool which runs on a server. The user connects through their computer via a browser.
3	TA	<i>What are your work experience, your current role and your relation to BI?</i>
4	R4	I have been working in this company for 2 years almost. My technical profession is a technical business intelligence consultant. I am working project based with customers and my work involves understanding what the customers' needs and wants, and their businesses. And installing, implementing and modifying the system to such a way that it satisfies the customers' demands and fulfils their problems. It varies a lot from project to project and it is both very technical, but also business oriented. I get to work with many different industries and projects.
5	TA	<i>What are the most crucial reasons for implementing BI software at a municipality?</i>

6	R4	My personal opinion with why municipalities implement BI is because municipalities are part of the public sector, essentially funded by tax money, and the main reason is that they want to have a very good idea of the finances within the municipality. Where is money going? How is spending going? They want to be able to follow up on this as good as possible. They have a good idea about the budgeting and the money and the finances. It is especially important for them since it is tax money.
7	TA	<i>Do you always start with the finance part when you implement BI at municipalities?</i>
8	R4	It doesn't have to be. It depends. The sales process in the public sector and municipalities is that they can do what is known as RFI, request for information. Then they make a procurement where they ask for suppliers. Then they say what they need and the different suppliers can produce a product that can be tested, and also with a price tag on it. Then they measure how much these different products satisfies their needs, and because of this law it is often the cheapest competitor to fulfil their needs is the one they need to buy. Whenever there is a request for information from the municipality or the municipality wanting a financial tool in line with our product, we offer them a solution.
9	TA	<i>In what areas of a municipality does BI add most value and why? Who are the users and stakeholders?</i>
10	R4	It is very difficult to say. We have our modules targeting municipalities that has grown over time. The finance is first of all one of the oldest and basic modules. But I wouldn't say it offers more value here than in the other areas. Because nowadays, we have the finance module. We also have a very big and sophisticated module where they can use our tool to budgetize data and do it for the entire organization. So they start off by having, let's say metaphorically, a big coin purse for the budget on the top level. Then they are, through our system, dividing it down in the organization and are automatically customizing reports. So if you are one level below the top level when you login, you have received money and you can spend it on different parts of your business. The money is spread down through the entire organization and there is a review process from all the different executives, and this is gradually accepted up to the top level again. So a lot of work is actually in doing very advanced and very sophisticated budgets. It is very detailed on how much every single department, employee and the whole municipality costs. And also to use this information to do sophisticated projections and similar. That's our second module, and it works very close to finance because they interrelate, so they can follow live how they are doing compared to the budget and see if the budget is gonna break. You want to be able to have this information before it actually happens.

11	TA	<i>Is it used on all levels?</i>
12	R4	The customer decides on how detailed it should be. But it can be very detailed. You can basically budgetize to every last banana purchased in the organization. And what you should also consider for municipalities is that they are huge organizations. In average, a 10% of the people that live in the municipality area are working for them. For instance, around 30000 people are working for Malmö municipality. It is a big organization.
13	TA	<i>Who are the users and the stakeholders?</i>
14	R4	It depends. Generally, the executives are using our product, but of course there can be executives on many levels. There is also a group of people called controllers, people who manage finance and has responsibilities to follow up the financial part. It is also used by regular people. Our product is a system where you can combine both data you're getting from a financial system and from a HR system. You also have a lot of tools or ways to let users manually input data, feedbacks and comments and so on. You can mix those to data in a very good way. So it really depends, but if you want to generalize it, I would say executives and controllers.
15	TA	<i>What are the differences between the values added from BI to municipalities compared to other types of organizations? What are exclusive for municipalities?</i>
16	R4	We have certain modules that are specifically designed for municipalities. For instance, there is a module about school. Whenever it comes to municipalities, you have a lot of laws regulating all sorts of things. For instance, there is a law that all of the grades in school should be stored for, I don't know, 50 or 70 years. They have all these laws where they have to store data such a way that municipalities actually have been using data systems for 20 or 30 years. We have modules, such as the school module, where we important grades, statistics about number of kids, how they perform in school, and they can compare them with other municipalities. We also have a new module about social work. Abuse, addiction, all of the people going to health care, and elderly care is also in a module. They can follow work related to different areas.
17	Tobias	<i>Is it used both from government to citizens and internally within the government?</i>
18	R4	For the school it is used by executives, principals and higher officials in the schools. They use the system to see how the kids are performing and how the teachers are performing, which teacher are giving the specific grades, and try to use it to improve.
19	Tobias	<i>What are the main challenges of implementing BI at a municipality?</i>

20	R4	<p>I wouldn't say there is any kind of main challenges in particular. Whenever you want to solve something, you write algorithms which is basically computer instructed code on how to solve a problem. They tend to work in 147 scenarios out of 150 and then there is 3 scenarios where it doesn't work. The amount of weird bugs and technical problems that can arise are infinite. I don't find that there is a few main challenges that always occur. It is not like that. I guess a main challenge is when the customer is not putting enough effort into the project since they are busy. For projects to be really successful, to move along quickly, you need to have people from our side that are dedicated to work with it and continuously trying to develop and progress the solution. But also, the customer need to actually put a lot of effort and time to it as well. Because obviously the customer knows their business. For instance, I have no idea of these amounts of kids are correct. But the school principal does however. They have to validate and I guess that is the main challenges to have the right people and time. Municipalities usually have a huge workload so they always have a lot to do. Sometimes this is challenging to make them be able to find time for this.</p>
21	Tobias	<p><i>Are there any common barriers or issues with acceptance when implementing BI in municipalities? How are they handled?</i></p>
22	R4	<p>No, I wouldn't say that. For the executives, it is essentially about saving money. For instance, if the system once finished can do certain things that were done by manual labour before, and it saves money, then the high executive will purchase it. The actual guy working and doing the manual work, for instance getting data and putting it together in excel, manually drawing diagrams, will obviously feel threatened by this because the system is gonna do his work. But, it is not generally a problem. It is what the executives decide.</p>
23	Tobias	<p>So the executives decide and the employees just follow the order?</p>
24	R4	<p>Essentially, yes. The executives have a lot of pressure to be efficient so that is what it should be since it's tax paying money.</p>
25	Tobias	<p><i>Could there be any issues implementing BI because of the size of a municipality and the numbers of employees?</i></p>
26	R4	<p>We have bigger municipalities and of course it's not issues as per se. It raises the stakes more. If you have a smaller municipality with 5 people using the system and something is down or something is not running, it is not the world's end. But with the bigger municipalities you maybe have hundreds of people using the system and imagine it crashing or if it goes down. Every minute here is a minute of time where hundreds of people not being productive. That is obviously a big part of it, and obviously with those huge customers the work you do as a technician is actually kind of different. Maybe you have to</p>

		work night times or late evenings when no one is in the system. You cannot just log in and start doing your things in production environment. You have to do it in a test environment, then you publish it to the next level and verify it.
27	Tobias	<i>Is there any issue working with different divisions in a municipality? Like the school, elderly care, etc.</i>
28	R4	We refer to them as modules. The modules are sold separately in separate packages. I'm not sure about the price model, but I think if you buy more modules you can get a discount.
29	Tobias	<i>Is it common that they buy all the modules?</i>
30	R4	Some customers want all, and some customers only need a specific module. The common pattern is that they usually start off with one or two modules, and then they actually find out that it helps a lot. Then they gradually over time purchase more, and add more. I mean, as well as for another organization, it is educational and requires change. It requires a learning process. It is easier to start of small and then expand what you are doing, then just drop everything and start everything. It varies a lot though.
31	Tobias	<i>What is your opinion about stakeholders' knowledge in the BI field at municipalities?</i>
32	R4	I think Sweden is exceptionally good at BI. Especially in the public sector. I think there was an article saying that Swedish public sector is among the best in the world when it comes to BI. I'm not completely sure why that is so, but I think it's because we have had laws, regulating for a really long time. They need to document and store for instance grades or other information about people. I mean, you can do a lot of things on the internet these days, all of the big authorities have tools and services directly through the internet. Skatteverket for instance. Because it is so good, BI is a natural thing. If you have everything stored in databases, then BI is much easier because you can just get it and start analysing it. So I think Sweden is on the forefront with the use of BI in the public sector. When it comes to technology for public sector we are quite modern.
33	Tobias	<i>Okay! So that goes both for municipalities on a local level and country councils on regional level?</i>
34	R4	Yes.
35	Tobias	<i>How do you work to educate users at the municipality to use the software properly?</i>
36	R4	It is different. There are system manuals. There are user manuals. There is also a lot of webinars and educational videos, and those kind

		of tutorials. Everything is accessible if you are a customer. We have a community online where you can post questions, you have forums, feedback. If it is a very specific thing, you can hire a consultant to have a workshop with you, to visit your office and sit with a few people, known as super users. Then they spread their knowledge to the rest of the organization. There is systems in place for these sort of things. It really depends on what kind of knowledge customers got. We are always striving to make software which is really easy and intuitive. It does not tend to be a software that you need months and months to understand. It is supposed to be just about clicking and understanding and be very easy for a lot of people.
37	Tobias	<i>So you don't experience any differences here between municipalities and the private sector?</i>
38	R4	No. I think it's a personal thing. If you are very curious in your personality, then you gonna learn and have more questions.
39	Tobias	<i>Do you think municipalities are slower in adapting to BI than companies in the private sector?</i>
40	R4	To some degree they maybe are. When some of these IT-contracts and when they are buying these systems and you have a legal agreement, you purchase them for many years before you can do a new procurement. Maybe it's the time spent that makes them a little bit slower to change. But then again, my personal opinion is that Swedish municipalities are kind of good already.
41	Tobias	<i>Are they as fast as a company in the private sector if you consider the time spent from project initialization to implementation?</i>
42	R4	My part of the work is usually starting when the paperwork is already done and when they have decided to start implement.
43	Tobias	<i>Do you believe that Swedish municipalities use BI software to its full potential or are there room for improvements? I.e. Is there a gap between what can be done with BI and how the municipalities are using the software?</i>
44	R4	To be realistic you can always do more. Just recently, more and more municipalities have been starting to put together different modules that before talked separately. But if you are connecting finance to the school module, you can all of the sudden see how much every single grade and teacher is costing in relation to what grades it produces, you can start making all sorts of correlations and stuff. Well, naturally, the more connections you make, the more complex it is, and the more work it is. But the possibilities are endless and I think we are striving towards this if you look at it. More and more is being automatized. If you look at the shared amount of the data the systems are using and analysing, it's growing all the time.

45	Tobias	<i>Does it vary a lot from municipality to municipality how far they have come with their BI solution?</i>
46	R4	It varies a lot. If you had an early start and started adopting early, using these kind of tools, put the practices in place about how they would store data, then it's much easier. Compared to a customer that haven't done this, the data quality is worse and so on. They cannot do the same thing.
47	Tobias	<i>Do you think all municipalities have a BI solution?</i>
48	R4	To some extent, I would say so. If you consider the BI solution to just have some form of analytical thing from all of your systems, then yes. But I'm guessing the average municipality has at least 20-30, if not more, various forms of IT-systems who regulate different things. If you take school for instance, you have a HR-system for all the employees, a finance system where you have the bills and the money, maybe a salary system, school system that store the grades, etc. There are systems for everything. I'm guessing some of all these systems have some form of analytical capabilities. It is not unusual as well for municipalities to have multiple different BI-tools. They could have QlikView, Hypergene, etc.
49	Tobias	<i>You mean in different divisions?</i>
50	R4	Yes
51	Tobias	<i>Does all these systems make it more complex to implement BI at a municipality?</i>
52	R4	No, not really. We already have finished adapters so they know which tables and which data sources to look at, and otherwise you could always customize it to do a specific task.
53	Tobias	<i>How do you think the future use of BI in municipalities will look? Are you seeing any trends or shifts regarding the use of BI?</i>
54	R4	I think the whole connection with the different systems will be bigger. Some of these systems are very old that has been in place over 20-30 years. They are huge and very hard to change. It is getting easier to connect different data sources and correlations so I'm thinking we will see more of that.
55	Tobias	<i>Is there anything you would like to add to the subject of BI in municipalities?</i>
56	R4	No, I think I have covered it pretty good.
57	Tobias	I agree. Thanks for the interview!

Appendix 6 - Interview transcript Kävlinge kommun

Interview with: Kävlinge kommun

Interview date: 26th of April, 2016

Participants: BI-administrator (R5), Tobias Andersson (TA),

Respondents: R5

Interviewer: TA

Interview type: Face-To-Face

Interview duration: 29 minutes

Transcribed by: TA

Transcription date: 26th of April, 2016

Line	Speaking	Text
1	TA	<i>Beskriv kortfattat er organisation och vad ni jobbar med.</i>
2	R5	Kävlinge kommun är en kommun med 30000 invånare, 2000 anställda. Vi brukar säga att vi har 80 enhetschefer och sedan har vi även verksamhetschefer som är steget över. Och alla dessa har vi byggt upp vårt BI-stöd, Hypergene, för främst.
3	TA	<i>Vad har du för arbetslivserfarenhet, vad är din roll och din relation till BI?</i>
4	R5	Min roll är att vara ansvarig för vårt BI-verktyg som vi hela tiden försöker utveckla detta. Jag jobbar även med lite andra saker på ekonomiavdelningen, så förvaltningen av BI är ingen 100%-tjänst. Jag har även jobbat med ekonomisystemet i Malmö stad, raindance. Innan dess har jag jobbat som IT-konsult på Ica där vi datoriserade ICA-butikerna.
5	TA	<i>Hur kommer det sig att du hamnade här och arbetar med BI?</i>
6	R5	Det var ett intresse från min egen del. Jag tycker det är intressant och har dragit mig dit. Jag har lite IT och ekonomi i bagaget, så det var en bra kombo för den här typen av jobb. Så det var väl därför jag sökte mig till Kävlinge för det var en tjänst som lockade min profil. Jag har varit här sedan 2012.

7	TA	<i>Hur länge har ni haft ert BI verktyg?</i>
8	R5	Sedan 2009.
9	TA	<i>Vilka är det som använder BI-verktyget? Är det inom vissa speciella enheter eller används det över hela organisationen?</i>
10	R5	Det är lite uppdelat. Det började 2009 med enhetschefer. Det vill säga en rektor, en chef för boende, den typen av chefsroll. För att de skulle kunna följa upp sin verksamhet. Då byggdes modulen med hjälp av personalen och ekonomi för att ha en budget på den här nivån och naturligtvis en uppföljning med prognos. Engagerade enhetschefer och andra chefer vill sedan även att fler i sin avdelning ska kunna komma åt uppgifter. Av den anledning har det blivit fler användare. Sedan har vi även börjat med målstyrning där det är mindre siffror. Har man ett mål för en avdelning så är det inte bara chefens mål. Så det har blivit fler och fler.
11	TA	<i>Vad är ni främst ni vill uppnå med att ha ett BI-verktyg?</i>
12	R5	Kärnpunkterna för vår del är att kunna fatta välgrundande beslut som chef helt enkelt. Man vill ju ha så mycket information som möjligt på ett ställe. Det är jättesvårt med all data som finns. De som vanligtvis påverkar besluten som chefen tar försöker vi få in och använda BI-verktyget.
13	TA	<i>I vilka områden tillför BI mest värde och varför?</i>
14	R5	Ekonomi och personal är det väldigt bra. Men jag tycker att de flesta tycker det är användbart när vi väl bygger in det och gör det och förenklar detaljrikedomen. Saker blir mycket tydligare. Plus att man har en ny rapport med helt annan data. Det underlättare ju för cheferna att komma in. Som ny chef där man ska lära sig mycket drar man sig mer mot BI-verktyget för att få en överblick där.
15	TA	<i>Hur ser det ut med skolan då?</i>
16	R5	Vi har BI här, och det fungerar som det ska. Vad jag hör är dock att de inte använder det tillräckligt mycket. Så här har vi en liten plan på att försöka utöka detta.
17	TA	<i>Vad är den generella attityden gentemot er BI-lösning?</i>
18	R5	Det varierar. När jag kom hit så var det mycket negativt. Man vill gärna köpa in något och ha det klart direkt. Men sedan är det så mycket jobb lokalt att stå i. Man får egentligen bara ett system som ska fyllas, beskrivas och förklaras och tänkas ut hur vi ska ha det och vad vi ska se. Det jobbet tog nog musten ur många. Sedan när man kommer ut med nåt halvfärdigt så var inställningen negativ och att det var bättre innan i excel. Detta har vi haft med oss ett tag även om jag tycker det har börjat vända. Framförallt nya chefer som inte varit

		med på den här resan är väldigt positiva jämfört med de här gamla kommentarerna.
19	TA	<i>Har du haft någon del i detta arbetet? Hur arbetar ni med att utbilda användarna i att använda systemet?</i>
20	R5	Det vill jag ju tro. Jag arbetar lite med detta, men inte så mycket. Jag försöker påverka mina kollegor på ekonomiavdelningen och på personalavdelningen och även på lite andra ställen. På skolan har vi en som sköter deras modul och jag försöker prata lite med henne. Vi lyssnar även på vad vår leverantör säger och får tips därifrån. Men jag vill egentligen att ledningsgruppen i Kävlinge kommun använder det och ställer frågor baserade på datan för att väcka intresset för göra det mer intressant att vilja se sina egna siffror.
21	TA	<i>Skulle du säga att den generella uppfattningen är att lösningen är användbar?</i>
22	R5	Ja, det är jag övertygad om. Så fort vi stänger av det eller av någon anledning har det nere, så märker man att folk använder det.
23	TA	<i>Vilka är de främsta utmaningarna med att implementera BI i kommunen?</i>
24	R5	Dels är det väl att vi har så pass olika verksamheter. Vi har en som klipper gräset, en som tar hand om sjuka och gamla, vi har skolor, osv. Den här kombinationen gör det svårt att systematisera data, och jämföra data och beskriva det på samma sätt mellan dessa olika enheterna. Det tycker jag är det svåraste. Man vill så gärna utifrån min roll kunna säga hur vi gör, men så det blir lätt spretigt med många olika åsikter.
25	TA	<i>Tror du att det är svårare med BI i en större kommun än en liten?</i>
26	R5	Nej, faktiskt inte. Oftast blir det spretigt ändå. Vissa kommuner har inte verksamheten in-house, utan kör bara på beställningar. Då är man nog inte nere på lika mycket detaljer med så mycket åsikter. Därför tror jag en ren beställarorganisation kan ha det lite lättare.
27	TA	<i>Tycker användarna generellt att det är lätt att använda verktyget?</i>
28	R5	Man är igång ganska snabbt, men alla finesser och analys är lite svårt att få igång. Produkten vi använder är byggt på man ska göra så få klick som möjligt. Man tittar på vilken användare som har loggat in och så får de fram rätt uppgifter direkt. Men har man två verksamheter med två förskolor under en rektor så har de svårt att hitta rätt.
29	TA	<i>Så det kan alltså skilja mellan vem det är som använder lösningen?</i>
30	R5	Ja, det gör det.

31	TA	<i>Hur har utvecklingen sett ut över åren? Vad har ni gjort för utveckling sedan du tillsattes på din roll?</i>
32	R5	Man försöker få in så mycket data som möjligt, allt som är viktigt för att fatta beslut i ett system. Så det har varit en pågående process hela tiden. Vi tog in skola, och nu tittar vi på att ta in vård&omsorgs data. Nästa steg blir antagligen miljö och teknik, deras bygglovstider, osv. Det blir väldigt transparent för hela organisationen. Nu är det ingen som vet hur det ser ut med bygglovstiderna, etc. Genom att få in detta kan vi se i realtid om det ser dåligt ut, och steppa upp hela verksamheten. När jag kom var det knappt att budget fungerade, sedan har vi jobbat rätt hårt med att få till allt. Det handlade först mest om att de 80 enheterna skulle få sitt beslutsstöd, budget, prognos. Med tiden nu vill istället alla in, och grunden passar därför kanske inte så bra med att aggregera upp data. Vi har lite bekymmer där.
33	TA	<i>Men ni ser ändå en positiv utveckling över åren och att fler ser nyttan med lösningen?</i>
34	R5	Absolut, det går framåt. Det finns många skolor i detta, hur man använder detta. Ifall man ska ha allt i en stor sql-databas. Den här lösningen är kanske inte den allra bästa, men den fungerar väldigt bra. Den går att använda, vi kommer framåt och vi har ett tydligt mål med att försöka få ut så mycket som möjligt från det. T.ex. har vi detta med att skriva i word, excel och att kunna skriva och sammanställa och se detta. Då är det transparensen som är viktig, och snabbheten i att ta fram rapporter. Då jobbar man väldigt mycket med att ta ut data ur ett system, lägga in det i excel, räkna om det, flytta över det i word, och skriva sina texter. Sedan ska det jämföras med nån annan, med samma teckensnitt, bilder, sidnummer, osv. Det är oändliga timmar som läggs på det, så här ser jag min egen vision att slippa allt detta.
35	TA	<i>Du hade ju även jobbat i Malmö kommun. Ser du någon skillnad mellan deras användning av BI jämfört med er?</i>
36	R5	Det blir ju lite spretigare i Malmö tack vare att deras produkt, när jag var där, inte kunde göra exakt de saker som vi kan göra med vår produkt. Samtidigt var deras produkt snabbare. Men det är frågan om vad som är det viktiga här. Om det viktiga istället är att få ut den slutgiltiga rapporten. Det är olika vad man vill ha.
37	TA	<i>Så det är bara vägen till själva slutresultatet som är olika? I själva verket kanske det inte spelar jättestor roll vilket verktyg man har?</i>
38	R5	Nej, det tror jag inte. Man ska se till att få en bra process i sin egen kommun, eller sitt eget företag. Det tror jag är det viktiga.
39	TA	<i>Vilka förbättringsmöjligheter finns i användningen av BI inom</i>

		<i>kommunen?</i>
40	R5	Framförallt är det utskrifter och rapportering. Nu känner man att vi kanske har 2-3år till innan vi kan få ut en ganska bra pdf-rapport. Jag vet inte riktigt om det går tillräckligt fort, och det är frågan om man kanske dessutom vill ha det i mobilen eller surfplattan. Det har varit med länge nu att det ska finnas där. Jag vet inte riktigt vad nästa steg är och var man tittar på rapporter. Är det en pappersrapport eller en pdf som läses. Men just att få ut det snabbt och snyggt och kunna lagra det. Även detta med att kunna skriva egna texter, se sina gamla texter och kunna fortsätta med dem, ta med dem vidare. Idag är systemen bra på att hämta data, siffror, aggregera, slå ihop, göra diagram, etc, men analysen och kommentaren går att förbättra. Det är inte word-liknande att man kan sitta och skriva. Det vill man nog ha ganska snart.
41	TA	<i>Om du tänker de olika avdelningarna, t.ex. ekonomi, HR och skola. Vad kan man göra mer i de andra avdelningarna där det inte används lika frekvent?</i>
42	R5	Det är ju att ta in deras försystem, deras verksamhetssystem. Kan denna datan tas in så ställs det frågor från styrning, polikter, chefer, hur saker ser ut. Då steppar man upp på en avdelning, så att sköta sitt försystem så att man ser rätt siffror. Då knyter vi även nyckeltal i vår målstyrning som kan ses i realtid i systemet. Då kan man följa upp det här och då gör det sedan att de är inne och använder det.
43	TA	<i>Presenterar ni någon data till invånarna som är baserat på ert beslutsstöd?</i>
44	R5	Vi har något som vi kallar för jämföraren, medborgarportalen. Så de här nyckeltalen lägger vi ut till allmän beskådan, så man kan jämföra skolor, äldreboende, hemtjänst, förskolor. Det är det vi har gjort. Och man kan jämföra kommuner med andra kommuner. Kommuners kvalitet i korthet. Men jag tror detta är nåt som kommer mer och mer. Att den där rapporten man skriver ska synas både internt och externt. För det är också ett jobb att publicera, ta ut information och skriva.
45	TA	<i>Görs det mycket jämförelser mellan kommunerna med hjälp av BI-verktyget?</i>
46	R5	Ja, massor.
47	TA	<i>Är det mest inom skola man jämför eller vilka områden skulle du säga man jämför mest inom?</i>
48	R5	Man jämför ganska mycket på kommunnivå. Nästan allt. För att styra en kommun räcker det inte att säga att vi är ganska bra på matte i Kävlinge. Exempelvis skola A är jättedålig, skola B är ganska bra och skola C är jättebra. Vi behöver veta exakt vilka skolor som är bra

		och hur den skolan står sig jämfört med andra. Då vill man ha data från andra enheter också att jämföra med. En rektor som sitter på en skola vill ju inte se Kävlinge kommuns siffror utan vill se sina egna siffror jämfört med andra kommuner. Så det är ett bekymmer idag. Vi är på väg åt rätt håll, och där är nog skola bäst.
49	TA	Vad tror du är skillnaden mellan att använda BI i en kommun och i ett privat företag? Tror du ni har kommit lika långt?
50	R5	Svårt att säga. Man vill väl åt hastigheten. Jag tror inte vi är så snabba som ett privat företag. De behöver resultaten kvickare. Sedan är det ju samma effekt på att ändra t.ex. personalstyrka privat som i kommunal verksamhet. Ifall det ska göras skillnad på årets resultat så ser det ut på liknande sätt. Så där är ju ingen skillnad. Bra kommuner ligger nog ganska långt framme och dåliga kommuner ligger efter i detta området.
51	TA	<i>Så där är ett gap mellan användandet av BI inom olika kommuner? Vad beror det på?</i>
52	R5	Ja, absolut. Det finns ingen politisk attraktion att besluta om att vi ska lägga nån miljon på ett BI-system när det finns barn med särskilda behov, eller äldre som inte får tillräckligt med hjälp. Det är alltid så mycket annat att beakta. De måste kunna motivera varför de lägger pengar på ett datasystem, och utveckla detta. Till exempel att jag kom hit för att förvalta, att ha en tjänst för att ta hand om vårt beslutsstöd är ju helt fantastiskt. Det vet jag att man inte har i alla kommuner, utan det kan se ut på andra sätt i andra kommuner och då blir lösningen sämre efter ett tag.
53	TA	<i>Är där några utmaningar gällande lagar och bestämmelser? Lagen om offentlig upphandling?</i>
54	R5	Det blir inte alltid det bästa systemet, utan vi får oftast ta det billigaste. Det är väldigt svårt att använda kvalitet som urval. Utan man väljer ofta utifrån priset. Det är inte för att man vill göra det, utan lagen är gjord så att det är svårt att säga vilken lösning som har bäst kvalitet. Det gör det lite svårt. När man gör en upphandling blir det att man tar det billigaste alternativet.
55	TA	<i>Hur tror du framtiden ser ut i användandet av beslutsstöd i kommunen?</i>
56	R5	Min vision är att vi ska gå mot att kunna göra sina anteckningar, skriver sina rapporter, att allt görs inne i BI-systemet när det gäller uppföljning av verksamheten i kommunen. Så allt finns på ett ställe. Då kommer vi kunna säga vad som ska publiceras och vad som ska skickas vart. Det blir inga nya kopieringsmaskiner.
57	TA	<i>Så med andra ord att kunna interagera lite mer med BI-lösningen?</i>

58	R5	Ja. Jag skulle vilja ha mer skrivande, kommentarer, osv. En like eller liknande.
59	TA	<i>Är det något du vill tillägga inom detta ämnet?</i>
60	R5	Det som vi diskuterar mycket när vi pratar om BI är att alla i en organisation har väldigt stora förväntningar. Sedan finns det väldigt många idéer om hur man ska utveckla ett sånt här system. En del är inte så jätteintresserad, men de som väl är intresserade vill ha massor av saker. Det är väl det här som diskuteras, det kostar ju en del att ta in, och frågan om vad man ska prioritera är viktig. Det kan jag tycka är ganska viktigt. Ett system ska ju inte kunna göra allt. Man vill ju samla det som är viktigt för att fatta beslut. Det är lätt att säga, men när man sitter med en grupp av människor som jobbar stenhårt med att klippa gräsmattor så tycker de att det är viktigt medan jag kan tycka att det inte riktigt hör hemma i detta systemet av nån anledning. Men det får man diskutera och prioritera. Det är en stor diskussion. Där är andra företag som kommer och vill sälja in grejer med saker kring big data och liknande. Det måste finnas nån gemensam nämnare, annars blir det bara massvis med data.
61	TA	<i>Så detta är den främsta utmaningen med BI för en kommunal verksamhet?</i>
62	R5	Ja. Det finns ju ingenting som är omöjligt inom IT-världen och alla vill ha nåt. Vi styr ju av väldigt många lagar också för hur vår verksamhet ska fungera. Rapportering som måste göras, myndighetskrav på oss att sköta vår verksamhet på ett visst sätt, och spara rapporter under en viss tid. Alla mejl som kommer in till kommunen är offentlig handling och ska sparas. Det blir en prioritering på de lagar och bestämmelser som måste följas.
63	TA	Okej! Då känner jag mig nöjd. Tack för intervjun!

Appendix 7 - Interview transcript Lunds kommun

Interview with: Lunds kommun

Interview date: 26th of April, 2016

Participants: Mattias Hedenrud (R6), Hafidz Alhaq (HA),

Respondents: R6

Interviewer: HA

Interview type: Face-To-Face

Interview duration: 29 minutes

Transcribed by: HA

Transcription date: 27th of April, 2016

Line	Speaking	Text
1	HA	<i>Could you please describe shortly your organization and how you work?</i>
2	R6	The organization is the municipality of Lund, the city of Lund. It has about 10,000 employees and we work as a municipality in Sweden which means that our main focus is school and healthcare, not health care to the citizens, but to the elderly. About 30% of our expenses go to school and preschool, and about 25% of our expenses go to the elderly care.
3	HA	<i>What are your work experience, your current role and your relation to BI?</i>
4	R6	I work in Lund for nearly 1 year as a management officer, kind of. My main job here is to implement the BI platform in Lund which was acquired before I began, and now we are rolling it out to the users. I should say also that before I started in Lund, I worked in another municipality, which has the same solution as Kävlinge kommun. I worked there for six years and with kind of the same BI development here.
5	HA	<i>Was it Staffanstorp?</i>
6	R6	Yeah.

7	HA	<i>Going to the main question, for how long has your BI software been in place here in Lund?</i>
8	R6	Well technically it has been here about a year, but in some parts of the organization, QlikView has been used for about ten years. So, parts of the organization, they have used QlikView as BI solution for ten years. But the latest year the combination of QlikView and Stratsys which we use, have been rolled out to all the interested users, about 300-400. We have a license for everybody who is employed here. So we have scaled it up a lot in the last year.
9	HA	<i>So everyone has the access to the software?</i>
10	R6	Yes. If they want to or need it.
11	HA	<i>Who are the users of the software? Maybe you can emphasize more?</i>
12	R6	Well, I would say the departments that provide services to the others, I mean our internal economics department and the HR department, they use it a lot, of course. That's one of the primary groups, I call them the specialists. The other group is the managers I would say: chiefs, CEOs.
13	HA	<i>I have another question here, since you have two software, which are QlikView and Stratsys, how is the distribution of use, is Stratsys more exclusive to some users than the other?</i>
14	R6	No, it's the other way around. The QlikView platform is a bit more exclusive because we have fewer specialists than general users. When we export data from QlikView to Stratsys, we do a selection. So we select what's important for the users.
15	HA	<i>What do you want to achieve from the use of BI software?</i>
16	R6	We have multiple reasons. I would say the primary reason is to simplify decision making and data illustration and also to reach higher level of maturity in the organization when working with data.
17	HA	<i>In what areas of municipality does BI add most value and why is that?</i>
18	R6	That's a tough question. It very much depends on what kind of source data that different departments have put in, for instance, QlikView, and depends on how well they could work with that prior to the BI solution. For instance, the HR department, they have pretty old system, so for them it was very big difference when they can use QlikView instead. For economics department, the big thing was that they can make all the other departments report to them in a standardized way. I can't actually say what department adds most value, but I can say it adds different kinds of value for different departments and I would say that most value is for the municipality in total. It depends

		on how they use it and what kind of problems they had before. And some department say now that they are saving a lot of time, and others they are getting much higher data quality, and for others it's kind of like streamlining effect that makes the quality and the resources better spent. So it's different kind of value and I can't put them versus each other.
19	HA	<i>Regarding the use of BI, how is the attitude towards using the software at the municipality?</i>
20	R6	It's shifting of course. I would say that specialists are very enthusiastic, they have been waiting for it, for a long time. Some of the common users are a bit tougher to convince perhaps, they are used to the old way and they perhaps see they don't gain more, they see more their own work situation, isolated. And for some individuals, it is harder to work now, it takes a bit more time, but instead they can serve perhaps 300 people, but they have to do a bit more now. For instance, if you move data from HR system to QlikView and then everybody in the organization can work with it, it takes a bit more time than simple excel list that you can do. So it's different, some like it, some don't. The general attitude is very good, I would say.
21	HA	<i>But still there are some people that are resisting until now?</i>
22	R6	Yes. One can always tell by when the first technical glitches appear, some people say that it was better before when we didn't have this, and some people say that well it's just a glitch, we'll fix it next time. So you can easily measure the attitude among the users. So I can say it's shifting, but in general it's good.
23	HA	<i>Do you think there is some factors like, maybe the elderly people tend to be more resistant to the use of BI?</i>
24	R6	No, I wouldn't say age is a factor. I would say, the more important is how you are used to work with data. And also I should say that we package solutions very tight. So they're very easy to use. We've done a lot of work when we create the apps and so on, to make it slim and narrow and effective. I wouldn't say age is a factor, I would say that tradition is more important factor. And also how your chief told you to work, how involved you've been, and so on. The implementation is much more important for the success than your age.
25	HA	<i>What is your opinion about how useful the software is for the users?</i>
26	R6	My isolated opinion is that it creates a lot of value for many users, it saves time, and it sharpens the use of data when make decisions.
27	HA	<i>What are the challenges when adopting BI?</i>
28	R6	The challenges that are specific to municipality is that we deal with a

		<p>lot of different sectors or work with a lot of different data and that decisions aren't always data driven, we're not a company that just makes money, we want to deliver services on high standards and so on, which means that decisions can sometimes be based on ideological grounds, instead of data for instance. That is a specific challenge for us in the municipality that I don't think other companies are having. The other challenge is that the general approach to data and BI is pretty low in public sector in Sweden because we historically haven't worked with it. So, we have kind of small revolution when it comes now. It's a lot of new thing in a very short span of time. And also the number of users of course, we have 10 thousand employees all the way from street sweepers to teachers and everything in between. I would say that is of course a challenge. And the data that we have is often very sensitive, so we have to think about safety and secure solutions.</p>
29	HA	<i>So the size is one of the challenge here.</i>
30	R6	It's a challenge, it's also possibility of course.
31	HA	<i>Facing the challenges, how do you work with educating the users of the software?</i>
32	R6	<p>In the QlikView case, the ones responsible for the application also take responsibility for educating the users which are from specialists. In the Stratsys case, it's more general management tool, we educate face to face in groups. And we also have kind of on demand hotline. Our main focus is to build the apps and solutions very good from beginning and very clear, slim, and tight so that there won't be any questions. To use QlikView is hard if you just start from zero. But if you are going to build an app, it's pretty easy. So the education is on demand and it's also when we are launching new application, in-house. We do almost everything in-house. We also help educate, and use super users as well. Every department has at least one, up to five super users. So we have a network of fifty people who know a bit more about the applications and about the systems and understand the integration and relations to the systems as well.</p>
33	HA	<i>If I may ask about the Stratsys, what is it?</i>
34	R6	<p>Well, it's part of the BI solution that delivers reports for the actual decision making which means that it shows you data from QlikView and it combines with text (text based governing). The data based governing means Stratsys which means that the political goals for instance are written down in text and then when you try to measure them, you get data from QlikView. You also measure them with the comment, text based comment. That combined gives you report that is the actual help for decision making.</p>
35	HA	<i>So this is another vendor or consultant.</i>

36	R6	Yes, it's another system, another company. Stratsys and QlikView work separately but also together. They're intimate. For instance, if you go to Kävlinge or Staffanstorp, they have a system called Hypergene. And Hypergene connects itself with other systems. In Lund, we integrate systems with QlikView and then we combine and manage data in QlikView and then transport it to Stratsys. So we don't mix the two, Hypergene is kind of the mix, we keep them separately. The data in QlikView and then Stratsys for decision making, for politician and so on.
37	HA	<i>Actually we had an interview with Hypergene the other day. Well, the next question, do the users find the software easy to work with?</i>
38	R6	Yes, so far.
39	HA	<i>For both of them?</i>
40	R6	Yes.
41	HA	<i>How has the use of the software evolved over years? What progress have you done?</i>
42	R6	Ok, it's kind of hard question because it's pretty new here and I'm even newer. But during the last six months, we have scaled up the users from about twenty to four hundred and I would say it evolves a lot every day almost, every week at least we launch new apps, new solutions, and so on. We are currently building, that I'm aware of, applications for 2 or 3 new systems, integrations to QlikView which we then will export to Stratsys, if needed. So I would say we have pretty fast evolvment right now.
43	HA	<i>So it always evolves, unlike a project where your client delivers the system and you use it for several years without improvement at all.</i>
44	R6	Well that's not so common, I would say. So no, with BI platform here. Our relationship with QlikView perhaps is going to be pretty static over the years. We patch it when they say of course, but the base product is the same. Then we use QlikView ourselves in different ways, but our relationship with them right now is pretty basic. With Stratsys, it's a bit more intense.
45	HA	<i>Is that because the municipality has been quite mature in using Qlik since it's been several years?</i>
46	R6	Mmm no. That could be it, but I also think that its strategic decision we have made to keep Qlik pretty basic as a platform. Not to mess around with the platform but instead to use it in different ways internally. So, we build new apps and so on, but the Qlik engine stays about the same. That's how we like it.
47	HA	<i>What improvement do you think can be done in the use of BI at the</i>

		<i>municipality?</i>
48	R6	I would say that the next couple of years is going to be spent in a combination of building new apps, but also to teach the organization how to use BI, when to use it, when not to use it, how to share information and how to secure data, and so on. So the systems themselves of course will be important, but I would say that the process of achieving more mature organization is more important right now.
49	HA	<i>How do you think the future use of BI in municipalities will look? Do you see any trend?</i>
50	R6	The trend is that we are getting a bit better on negotiations and demanding features with our source systems. Nowadays we always demand possibilities to integrate with QlikView when we buy a new system for economics or so on. I would also say that the general trend is that the use of this kind of systems is going up to a more professional level. Many more in the organization are starting to use it as we intended to be used. The conflict that we have is that many other specialist systems have some kind of BI part in them, and when you are doing your environmental check for instance, that specific system also has a bit of BI platform in it. So you can do some kind of analysis in the source system. That means that we now have many possibilities to analyse our data, but it's separated in many systems. So I think that one of the most important things that we have to do is stay committed to uniting our data in one place. Now I think that many municipalities will host some kind of data centres in not so many years.
51	HA	<i>One interesting fact when we had the interviews with the consultants is actually that they said, especially in Sweden, the municipalities are pretty advanced in using BI compared to companies in private sector. Do you agree with that?</i>
52	R6	I think that public sector is learning fast. Since we didn't use BI the last fifteen years as private sector did, when we get on the train now, we step in on much higher level from the beginning. The solutions are better built now than they were 10 years ago, they're much more secure, they're much more reliable, they're easier to use, and I would say they're also a bit cheaper. So I think that we're stepping in on a level which private sector has been on for a while, and the next step, the actual decision making, is a tradition which lies within the public sector. We're very good at the action of decision making which private sector perhaps is not. Our base is always the democracy that leads that we have obvious processes for the actual decision making. We know what to do with our data when it comes to us. Private sector has to somewhat learn to analyse in a way that we don't need to. We don't need to analyse everything because sometimes it's illegal for us, for instance, to make decision or so on. So we are kind of reg-

		ulated and have pretty strong tradition in that field. That means that we can scale up the use of BI pretty much and pretty fast. I think that we will continue doing that for a number of years.
53	HA	<i>Is there anything you would like to add to the subject of BI in municipalities?</i>
54	R6	I would like to add the actual part that one misses when discussing BI which is the decision making when you have the intelligence which is a very big difference from public sector with private sector. When we have data and we have it in the computer, black-white and we analyse it, the road from there to an actual effect is very different for public sector. I think that most of the BI vendors, they tend to try to make us a private company. For instance, if you see that black is good and white is not, then they will say, "therefore your decision should be black." It's not that easy with us, we have to analyse if we can make grey and why we still have to choose white and so on. The last part of the BI solution is never applicable to us because we don't want it. So it's a bit more complex, we're very good at making decisions, we're very good at analysing data, we've done it for a hundred years probably. In some part of public sector, we're very good at also mixing new research and so on which private sector could learn from us, I would say. They still have a lot more entrepreneurial kind of ideal that you specialize on data and risk capital or so on. I would also say that the implementation part is a lot harder for us because we don't have an obvious CEO that can tell everybody what to do or choose another job. We don't work that way. We are not that kind of employer and we never will be. We have large departments who almost only do what the government says which we can't control as much as you can in a company. Therefore, the management part of BI is extremely important.

Appendix 8 - Interview transcript Jönköpings kommun

Interview with: Jönköpings kommun

Interview date: 27th of April, 2016

Participants: BI-Administrator (R7), Tobias Andersson (TA),

Respondents: R7

Interviewer: TA

Interview type: Skype

Interview duration: 22 minutes

Transcribed by: TA

Transcription date: 28th of April, 2016

Line	Speaking	Text
1	TA	<i>Beskriv kortfattat er organisation och hur ni arbetar.</i>
2	R7	Jönköpings kommun har ungefär 132 000 invånare, så vi ligger på plats nummer 10 av kommuner i Sverige. I Jönköpings kommun jobbar cirka 12 000 personer som är månadsanställda. Sedan har vi ett antal timvikarier. Till dessa 12 000 anställda finns ungefär 600 chefer om vi ska mynna ut i det här med beslutsstöd. Då var det de här 600 cheferna som vi tänkte på när vi skapade vårt beslutsstöd, för att de skulle kunna följa upp sin verksamhet, fatta bättre beslut och göra analyser med hjälp av våra grundsystem.
3	TA	<i>Vad är din arbetslivserfarenhet, roll och relation till BI?</i>
4	R7	Jag är dataekonom i botten och har varit med i det här projektet som vi startade upp för 10år sedan, och vid själva införandet av beslutsstödet söktes en tjänst som systemekonom som jag fick. Jag jobbar 100% med detta sedan 2008 med Jönköpings kommuns beslutsstöd. Vi använder QlikView.
5	TA	<i>Så ni har haft er BI-lösning sedan 2008 då?</i>
6	R7	Ja, precis.
7	TA	<i>Vilka är det som använder BI-verktyget? Är det inom vissa speciella</i>

		<i>enheter eller används det över hela organisationen?</i>
8	R7	Det är främst cheferna. De är antingen personal eller ekonomiansvarig för någon verksamhet, eller både och. Sedan finns ett gäng specialister och experter som har tillgång till vårt beslutsstöd där jag har gjort applikationer som till exempel för antagning till gymnasieskola som några jobbar med. Jag har även en applikation för parkering och det är alla våra parkeringsautomater i kommunen. Då är det några specialister inom det området på tekniska kontoret som använder den applikation. Sedan har vi de stora applikationerna med ekonomi, personal och verksamhet. Det är främst chefer här.
9	TA	<i>Vad är det främst ni vill uppnå med användandet av BI? Om du tänker dig till exempel de tre absolut viktigaste huvudpunkterna.</i>
10	R7	Det som vi sa från början var att ha en gemensam världsbild så att säga. Att alla chefer ser samma bild och man kan styra de mot vad som är viktigt att följa upp. Skillnaden innan var att man själv gick in i de svåra expertsystemen och fick ut fel siffror på grund av okunskap. Det är väl den första saken, att man fick en gemensam bild av allt. Det blir även mer kvalitet i den data som kommer in då man upptäcker snabbare ifall nåt går snett. Säg att kostnaderna skenar iväg så ser chefen det ganska snabbt i och med att det är så enkelt att använda och man ser direkt i graferna om det går upp eller ner. Det är väldigt användarvänligt. Det sparar också mycket tid för cheferna. En rektor till exempel ska inte behöva sitta vid en dator hela dagarna utan ska ha tid att jobba med kärnverksamheten med sina lärare, elever och undervisning, och lägga upp en strategi för det. Så det är svårt ibland att räkna på tid, men det har sparat oerhört mycket man-timmar på administration. Det var ju ett av målen med det hela också. Att ta bort den här manuella sammanställningen av excel-filerna som man gjorde vid sidan av. Så både kvalitet och tidsbesparing är en av grejerna vi hade som syfte med att införa det.
11	TA	<i>I vilka områden tillför BI mest värde och varför? Är det ekonomi och HR?</i>
12	R7	Ja, det är de största delarna. Ekonomi känns som själva ryggraden. Sedan utgår man från ekonomin och dess koddelar. Sedan kan man bygga vidare och bygga på fler system här. Vi har t.ex. Äldreomsorg där man kan se hur många hemtjänststimmar är utförda i förhållande till budget. Så vi sammanför system med varandra också. Men ekonomi är själva stommen. Det började ganska stort och brett från början. Vi förde in fyra stora system på samma gång. Det var ekonomi, HR, barn/elev-system och vårt äldreomsorg-system. Så vi gick ut ganska brett för vi ville redan 2008 att cheferna skulle ha allting på ett och samma ställe. Inte att vi skulle börja med ett system och bara bygga på. Utan vi sa att det här skulle ersätta alla de system som chefer hade för att göra uppföljning och analys. Sedan har de

		kanske andra småsystem runtomkring, men de stora systemen skulle ersättas av ett gränssnitt.
13	TA	<i>Vad är din uppfattning av hur användbart er BI-lösning är? Vilken attityd har de till det?</i>
14	R7	Jag tycker att för de allra flesta, i alla fall majoriteten, blir det lite hallelujah-moments. Ibland är jag med i ledningsgrupper och på chefsträffar, och visar någon nyhet. De brukar bli väldigt glada och tycker att det här är det bästa de har fått som chefer. Sedan finns det alltid en liten klick som alltid tycker det är jobbigt med förändring när man kommer med nåt nytt. De får man nästan sätta åt sidan och hoppas att de dras med senare. Jag har ett tacksamt jobb på det sättet för de tycker att jag löser väldigt många problem åt dem. Och besparar mycket tid när jag visar de nya lösningarna.
15	TA	<i>Vad är de främsta utmaningarna med att införa ett beslutsstöd i kommunen?</i>
16	R7	Främst är det ju att systemen oftast inte pratar med varandra när man ger sig in i verksamhetssystemen. När man tittar på ekonomi och HR så har man oftast en konteringssträng, eller koddelar som gör att man kan matcha ihop dem. Utmaningen blir sedan när man ska hänga på ett äldreomsorgssystem som inte har samma koder, utan där har man en annan kodstruktur. Så det är ganska mycket jobb i början med att översätta de här koderna och matcha ihop koder. Så man skulle kunna titta på ett äldreboende både när det gäller ekonomi, HR och brukare som bor där. Då måste man ha nycklar som matchar ihop dem. I vår kommun har vi ungefär 500-600 system och de pratar oftast inte med varandra. Så där är den riktigt stora utmaningen att inte bara köpa in system efter system, utan de måste kunna prata med varandra.
17	TA	<i>Vad är din uppfattning om vad användarna tycker om hur lätt lösningen är att använda?</i>
18	R7	Jag hoppas att det är jättelätt för det är jag som har byggt gränssnittet. Jag gör det rent tekniskt, men jag sitter ofta med nyckelanvändare som vet användarna behöver. Ska jag utveckla ett gränssnitt för äldreomsorgen så sitter jag med ekonomer, personalare, representanter för vissa yrkesgrupper. Vi sitter och går igenom vad man vill ha och vad man vill se och på vilket sätt. Ska man ha ett linjediagram eller stapeldiagram? Vad ska man kunna göra för urval? Så jag hoppas ju att kravställarna gör en tydlig kravspecifikation. Sedan försöker jag ta inspiration från andra kommuner, från konsulter som kommer med nyheter gällande gränssnitt, färger, knappar. QlikView är som ett tomt arkt och där har man full frihet med var man placerar alla objekt, vilka färger och former man vill använda. Det är bara fantasin som sätter gränser, men man får inte ha för mycket fantasi för då blir det svårt. Jag försöker hålla det ganska

		enkelt, fast ibland måste det en hel del information. Det är väl det som är det positiva att man har alla sina grejer i QlikView. Så man är van vid samma gränssnitt oavsett om man sitter på ekonomi eller på personal.
19	TA	<i>Hur har utvecklingen sett ut över åren? Vilka framsteg har ni gjort?</i>
20	R7	Ja, det är ständiga förbättringar. Jag jobbar med detta 100% och jag jobbar med utveckling 80% och 20% administration och underhåll. För det mesta utvecklar jag. I dagsläget har vi 100 applikationer för massavis av olika datakällor. Det är säkert 10-12 olika system idag och en hel del xml, csv och excelfiler där man faktiskt inte har ett system för vissa saker. Då måste vi ta in excelfiler även om det blir lite manuellt så blir det en bra sammanställning i beslutsstödet. Till exempel kan jag nämna att för parkering får jag in sammanställningar från sms-parkeringsbolag. Då väver vi ihop dessa filer till en enda applikation med ett gränssnitt. Vi försöker hela tiden hitta nya användningsområden även om det bara är en väldigt specifik verksamhet så kan man ändå bli hjälpt av ett beslutsstöd. Jag kan ju bygga dessa enkla applikationerna själv. De stora beslutsstödsapplikationerna, t.ex. HR, är väldigt knepiga, så där hyr vi in konsult för att hjälpa till. Annars gör vi mycket in-house, rent utvecklingsmässigt i Jönköpings kommun. Vilket gör att vi också håller nere kostnaderna. Det är ju min lön som kostar, men jag är en stöttande konsult i organisationen. När man vill beställa något, så gör man det via mig och så sitter vi och utvecklar tillsammans. Så det är ständig utveckling, ständig förbättring av våra befintliga applikationer. Och mina användare är väldigt duktiga på att beställa och man är inne i beslutsstödstanke. Så man ringer gärna mig och kollar om det går att göra i QlikView. Där har vi kommit ganska långt och jag vet andra kommuner som inte riktigt har fått det här gensvaret från användarna. Men det gäller att marknadsföra och göra gränssnitt som är enkelt, inte för mycket information och så vidare. Det är lite olika framgångsfaktorer som gör att vi har en väldigt hög användning av applikationerna i Jönköpings kommun. Vi har väl en 3000-4000 inloggningar per månad ungefär, på dessa 600 användarna.
21	TA	<i>Hur långt tycker du att kommuner i allmänhet har kommit i användandet av BI?</i>
22	R7	Det är svårt att jämföra utanför kommunens värld. Men däremot är Jönköpings kommun i framkant för vi har gått ut väldigt brett och utvecklar mycket själva. Där har vi kommit långt. Och när jag pratar med kollegor i andra kommuner.. Vi har ju ett väldigt fint nätverk och det kanske är en framgångsfaktor inom kommunal verksamhet att vi inte är konkurrenter. Jag kan ju bjuda på en lösning ifall nån ringer mig från en annan kommun och frågar hur jag har löst en elevapplikation till exempel. Då kan jag ju skicka den till dem och

		visa hur jag har löst det. Det kan man inte göra inom företag eftersom man har olika framgångsfaktorer som man inte vill dela med sig. Så det tror jag är den största skillnaden. Det behöver inte kosta jättemycket pengar om man är lite smart, nätverkar och samverkar. Vi kan kopiera och klistra väldigt mycket från varandra
23	TA	<i>Tror du alla kommuner har ett beslutsstöd?</i>
24	R7	Det vet jag inte, mer eller mindre. Sedan är det hur man definierar beslutsstöd. Så brett som vi har är nog bara en handfull eller max 10 kommuner inom QlikView som finns. Sen finns det de som bara har beslutsstöd för ekonomi, eller för HR, eller liknande. Vi har ganska brett och stort ändå. Sedan finns det de som har ännu större. Jag tror det är nån kommun som har en kommunlicens så att alla anställda kan gå in på deras beslutsstöd och då kan man ju tänka andra grupper.
25	TA	<i>Tror du att storleken på kommunen spelar roll i hur man inför BI?</i>
26	R7	Nej, där kan jag nästan säga tvärtom. Jag har sett en del små kommuner som har gjort väldigt mycket. Till exempel i Ulricehamn som har 25 000 invånare känner jag två personer som jobbar med deras beslutsstöd och de har gjort väldigt mycket. Jag tror det handlar om vad man har för strategi och vad man har för kommundirektör. Vad har man för ledning? Vad har man för politiker? Sånt tror jag är viktigare än storleken på kommunen. Vad satsar man på? Här har jag alltid haft en liten gräddfil med att det här är ett politiskt beslut att vi ska använda beslutsstödet i första hand. I andra kommuner har man kanske inte pekat så med hela handen, utan det blir lite vid sidan av man sköter det. Då blir det inte samma tryck, inte samma användning och genomslagskraft. Sedan finns det Malmö och Göteborg som säkert har välfungerande beslutsstöd. Stockholm vet jag inte.
27	TA	<i>Hur viktig tror du din roll är? Det vill säga att ha en systemförvaltare för BI-lösningen i en kommun.</i>
28	R7	Utan en förvaltare tror jag att det hade ramlat mellan stolarna. Jag har sett exempel på andra kommuner som jag har pratat med. Till exempel en ekonom som ska jobba med beslutsstöd en viss procent, sen en annan som ska jobba en viss procent. Och det blir så himla konfliktfyllt för man kanske jobbar med nåt helt annat till vardags, och då ska man ta sig tid för att underhålla och utveckla. Då tror jag det är lätt att faller mellan stolarna. Jag tycker det är lite knapert att vi bara har mig här. Det blir väldigt personberoende när jag ska ha semester eller om jag blir sjuk. Så jag tycker vi borde ha någon mer. Jag har en kollega som liten backup som rycker in, som kan lite grann. Men om vi jämför med Helsingborg som har liknande storlek som Jönköping, så har de cirka 6 personer som jobbar kring beslutsstödet och de har 400 användare. Men de har en helt annan strategi. De har en strategi i grupp, en utvecklingsgrupp och en styrgrupp. Så de har ett helt annat upplägg. Jag gör lite mer ad hoc-

		lösningar, släcker bränder lite för mycket. Där har vi väl vår brist så att säga, att vi borde ha lite mer uppvaktning och lite mer framåttänk vad det gäller beslutsstöd. Min tjänst är ju 100% och då både utvecklar jag och administrerar och tar hand om alla servrar. Det är ganska mycket grejer. Jag tror att det är ungefär 20 miljoner transaktioner som går in i vårt beslutsstöd varje natt och varje morgon kollar jag att allt har gått som det ska. Det kan ju hända något på vägen.
29	TA	<i>Vad tror du att det finns för förbättringsmöjligheter i användandet av BI inom kommunen? Hur tror du det framtida användandet kommer se ut?</i>
30	R7	Det som vi saknar i vårt beslutsstöd är möjligheten att kunna lägga in data. Jag vet att det finns vissa beslutsstöd som har den möjligheten, men QlikView har den inte. Så vi har kompletter med ett system som heter Stratsys, som kanske också kallar sig lite för beslutsstöd. Men det är svårt, för Stratsys är inte bra på analys som QlikView är. Som de kompletterar varandra på nåt sätt ändå. Ibland blir det svårt att få allt i ett. Och där har jag sett dåliga exempel på system som försöker göra allt i ett. Då blir det inte riktigt bra i nåt utav det. Men det skulle man kunna hoppas på i framtiden att just inmatningsmöjligheterna i ett analysverktyg skulle kunna bli bättre.
31	TA	<i>Är det kommentarer till rapporter och analyser du tänker dig?</i>
32	R7	Ja, och prognoser. Och kunna fylla i en egen kolumn på det ekonomiska resultatet på vad man tror när man pronotiserar hur det här bokslutet ska gå. Var kommer vi landa om det fortsätter så här? Så just nu gör vi detta i ett annat system och de har lite svårt att prata med varandra i dagsläget. Men vi försöker lösa detta. Man får ut informationen från QlikView och sedan vill de kommentera det i Stratsys. Där kan jag tycka att det borde finnas utvecklingsmöjligheter så det blir smidigare. Att samverka mellan inmatning och analys.
33	TA	<i>Är det något annat du vill tillägga inom ämnet om BI i kommunen?</i>
34	R7	Inte vad jag kommer på. Men har ni någon följdfråga så får ni gärna mejla.
35	TA	Okej, då tackar jag för intervjun!

References

- Atkinson, R. D., & Ulevich, J. (2000). Digital government: The next step to reengineering the federal government. *Progressive Policy Institute Technology and New Economy Project*.
- Bekkers, V. J., & Homburg, V. (Eds.). (2005). *The Information ecology of e-government: e-government as institutional and technological innovation in public administration* (Vol. 9). IOS Press.
- Bhattacharjee, A. (2012). *Social science research: principles, methods, and practices*.
- Bower, J. L., & Christensen, C. M. (1995). *Disruptive technologies: catching the wave* (pp. 506-20). Harvard Business Review Video.
- Brinkmann, S., & Kvale, S. (2005). Confronting the ethics of qualitative research. *Journal of constructivist psychology, 18*(2), 157-181.
- Chaudhuri, S., Dayal, U., & Narasayya, V. (2011). An overview of business intelligence technology. *Communications of the ACM, 54*(8), 88-98.
- Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business Intelligence and Analytics: From Big Data to Big Impact. *MIS quarterly, 36*(4), 1165-1188.
- Cherkis, J. (2013). *Microsoft Dynamics Voice: Technology Adoption Slower, But Certain In Government -- And For Good Reason*. [online] Forbes. Available at: <http://www.forbes.com/sites/microsoftdynamics/2013/01/28/technology-adoption-slower-but-certain-in-government-and-for-good-reason/#437f5ec84685> [Accessed 14 Apr. 2016].
- Chun, S. A., Shulman, S., Sandoval, R., & Hovy, E. (2010). Government 2.0: Making connections between citizens, data and government. *Information Polity, 15*(1), 1.
- Collier, D., & Mahoney, J. (1996). Insights and pitfalls: Selection bias in qualitative research. *World Politics, 49*(01), 56-91.
- Dahlberg, T., Mallat, N., & Öörni, A. (2003). Trust enhanced technology acceptance model-consumer acceptance of mobile payment solutions: Tentative evidence. *Stockholm Mobility Roundtable, 22*, 23.
- Davis Jr, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* (Doctoral dissertation, Massachusetts Institute of Technology).
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science, 35*(8), 982-1003.

- Dutta, S., Geiger, T., & Lanvin, B. (2015). The global information technology report 2015. In *World Economic Forum*.
- Fang, Z. (2002). E-government in digital era: concept, practice, and development. *International journal of the Computer, the Internet and management*, 10(2), 1-22.
- Ferris, E. (2010). The role of municipal authorities. *Forced Migration Review*, (34), 39.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: an introduction to theory and research*. Massachusetts: Addison-Wiley Publishing Company.
- Gangadharan, G. R., & Swami, S. N. (2004). Business intelligence systems: design and implementation strategies. In *Information Technology Interfaces, 2004. 26th International Conference on* (pp. 139-144). IEEE.
- Gartner, (2016). Gartner.com. [online] Available at: <http://www.gartner.com/technology/about.jsp> [Accessed 6 Mar. 2016].
- Gibson, M., Arnott, D., Jagielska, I., & Melbourne, A. (2004). Evaluating the intangible benefits of business intelligence: Review & research agenda. In *Proceedings of the 2004 IFIP International Conference on Decision Support Systems (DSS2004): Decision Support in an Uncertain and Complex World* (pp. 295-305). Prato, Italy.
- Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, 24(2), 105-112.
- Hancock, B., Ockleford, E., Windridge, K. (2009). An introduction to Qualitative Research. *The NIHR Research Design Service for Yorkshire & the Humber*, 4-37.
- Isik, O., Jones, M. and Sidorova, A. (2011). BUSINESS INTELLIGENCE (BI) SUCCESS AND THE ROLE OF BI CAPABILITIES. *Intelligent Systems in Accounting, Finance and Management*, 18(4), pp.161-176.
- Karpp, D. 2009. "Blogsphere Research: A Mixed-Methods Approach to Rapidly Changing Systems," *IEEE Intelligent Systems* (24:5), pp. 67-70.
- Klein, H. K., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS quarterly*, 67-93.
- Kvale, S., & Brinkmann, S. (2009). *InterViews : learning the craft of qualitative research interviewing*. Los Angeles: Sage Publications
- Miles, M. and Huberman, A. (1984). Drawing Valid Meaning from Qualitative Data: Toward a Shared Craft. *Educational Researcher*, 13(5), pp.20-30.
- Myers, M. and Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization*, 17(1), pp.2-26.
- Moon, M. (2002). The Evolution of E-Government among Municipalities: Rhetoric or Reality?. *Public Administration Review*, 62(4), pp.424-433.

- Moon, M. J., & Norris, D. F. (2005). Does managerial orientation matter? The adoption of reinventing government and e-government at the municipal level*. *Information Systems Journal*, 15(1), 43-60.
- Orlikowski, W.J., & Baroudi, J.J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information systems research*, 2(1), 1-28.
- Parenteau, J., L. Sallam, R., Howson, C., Tapadinhas, J., Schlegel, K. and Oestreich, T. (2016). *Magic Quadrant for Business Intelligence and Analytics Platforms*. [online] Gartner.com. Available at: <https://www.gartner.com/doc/reprints?id=1-2XXET8P&ct=160204> [Accessed 24 Mar. 2016].
- Pettey, C. and Van Der Meulen, R. (2008). *Gartner Reveals Nine Fatal Flaws in Business Intelligence Implementations*. [online] Gartner.com. Available at: <http://www.gartner.com/newsroom/id/774912> [Accessed 29 Mar. 2016].
- Qlik. (2016A). *Qlik Partners - Qlik.com*. [online] Available at: <http://www.qlik.com/partner?partner=&industry=®ion=all&page=102> [Accessed 6 Mar. 2016].
- Qlik. (2016B). *Jobs At Qlik: Join The Team*. [online] Available at: <http://www.qlik.com/company/careers> [Accessed 25 Apr. 2016].
- Recker, J. (2013). *Scientific research in information systems*. Berlin: Springer.
- Regeringskansliet. (2015). *Objectives for municipalities and county councils*. [online] Available at: <http://www.government.se/government-policy/municipalities-and-county-councils/objectives-for-municipalities-and-county-councils/> [Accessed 24 Mar. 2016].
- Riad, A. M., El-Bakry, H. M., & El-Adl, G. H. (2010). A novel DSS framework for E-government. *IJCSI*, 32.
- Riksdagen. (2016). *Lag (2007:1091) om offentlig upphandling*. [online] Available at: http://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20071091-om-offentlig-upphandling_sfs-2007-1091 [Accessed 25 Apr. 2016].
- Savoska, S., Loskovska, S., & Dimitrovski, I. (2008, June). Information visualization from the public utilities databases of local municipality for municipalities managers. In *Information Technology Interfaces, 2008. ITI 2008. 30th International Conference on* (pp. 237-242). IEEE.
- Seifert, J. (2003). *A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance*. Ft. Belvoir: Defense Technical Information Center.
- Skf.se. (2016A). *Kommungruppsindelning - SKL*. [online] Available at: <http://skf.se/tjanster/kommunerlandsting/faktakommunerochlandsting/kommungruppsindelning.2051.html> [Accessed 1 Apr. 2016].

- Skl.se. (2016B). *Sweden's democratic system - SKL*. [online] Available at: <http://skl.se/tjanster/englishpages/municipalitiescountycouncilsandregions/swedensdemocraticsystem.1301.html> [Accessed 16 Mar. 2016].
- Skl.se. (2016C). *The role of the municipalities - SKL*. [online] Available at: <http://skl.se/tjanster/englishpages/municipalitiescountycouncilsandregions/theroleofthemunicipalities.1302.html> [Accessed 16 Mar. 2016].
- Stieglitz, S., Brockmann, T., & Dang-Xuan, L. (2012). Usage Of Social Media For Political Communication. In *PACIS* (p. 22).
- Swanson, E. B. (1974). Management information systems: appreciation and involvement. *Management science*, 21(2), 178-188.
- Relyea, H. C. (2000). Paperwork Reduction Act reauthorization and government information management issues. *Government Information Quarterly*, 17(4), 367-393.
- Tat-Kei Ho, A. (2002). Reinventing local governments and the e-government initiative. *Public administration review*, 62(4), 434-444.
- Trattner, J. (2000). *E-gov revolution transforms federal operations*. [online] Government Executive. Available at: <http://www.govexec.com/federal-news/2000/11/e-gov-revolution-transforms-federal-operations/8066/> [Accessed 4 Apr. 2016].
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.
- Watson, H. J., & Wixom, B. H. (2007). The current state of business intelligence. *Computer*, 40(9), 96-99.
- Watson, J. B. (1913). Psychology as the behaviorist views it. *Psychological review*, 20(2), 158.
- West, D. M., & Lu, J. (2009). *Comparing technology innovation in the private and public sectors*. Governance Studies at Brookings.
- Yang, H., and Callan, J. 2009. "OntoCop: Constructing Ontologies for Public Comments," *IEEE Intelligent Systems* (24:5), pp. 70-75
- Zeb, J., Froese, T., & Vanier, D. (2012). Survey of information technology use for municipal infrastructure management.