The Role of Business Intelligence in Government:
A Case Study of a Swedish Municipality Contact Center

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Abstract

The aim of this study is to investigate the role Business Intelligence (BI) can play in government and more specifically at the municipality level. The study aims to investigate how data collected from a municipality Contact Center can be leveraged with the help of a BI solution. The study focuses on the Contact Center at Järfälla Kommun (municipality) and investigates whether a BI implementation can help to realize more effective planning, resource allocation and improved services and e-services. Municipality Contact Centers are becoming an increasingly popular precedent providing municipal residents with a centralized service where they can make inquiries, provide information, lodge complaints or commend actions related to activities within the specific municipality. BI can turn raw data into concrete figures and reports, map patterns and trends and support effective decision making. It can also however be costly and difficult to integrate and face resistance due to perceived complexity. This paper aims to take such notions into consideration and investigate the feasibility of implementing such a solution in the context of a municipality Contact Center.

This paper identifies various benefits and drawbacks from literature which are then modeled into a SWOT framework. In addition, semi-structured interviews are utilized in this study and targeted at stakeholders knowledgeable in the Contact Center, BI, or both. Findings from the SWOT framework will be measured against the findings from the interviews and an analysis of correlations between the two sources will be investigated.
Acknowledgement

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Tröllhättan December 2012

Olawale Adelakun
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### Abbreviations:

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<th>Meaning</th>
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<tr>
<td>CC</td>
<td>Contact Center</td>
</tr>
<tr>
<td>BI</td>
<td>Business Intelligence</td>
</tr>
<tr>
<td>CRM</td>
<td>Customer Relationship Management</td>
</tr>
<tr>
<td>DW</td>
<td>Data Warehouse</td>
</tr>
<tr>
<td>OLTP</td>
<td>On-line Transaction Processing</td>
</tr>
<tr>
<td>ETL</td>
<td>Extract Transform Load</td>
</tr>
<tr>
<td>KBT</td>
<td>Knowledge Based Theory</td>
</tr>
<tr>
<td>MIS</td>
<td>Management Information System</td>
</tr>
<tr>
<td>OLAP</td>
<td>On-line Analytical Processing</td>
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</table>
1 Introduction

This chapter aims to provide a general overview of concepts that include BI, e-Government and Contact Centers. The scope and focus of the thesis as well as a breakdown of the structure and schedule will be investigated within this chapter.

1.1 Background

BI is a technology that is far more prevalent in the private sector enabling executives, managers, operational personnel and decision makers to make fact based decisions which are the result of analysis of data within their organization and its processes. The objective of BI Systems is to improve the timeliness and quality of input to the decision process according to Negash (2004). The widespread adoption of BI in the private sector has been necessitated by competition and the need for companies to gain crucial insight into their company and to use that information as leverage. The cornucopia of knowledge that can result from an organization combining operational data with analytical tools can potentially help bolster different facets of the business.

The ubiquity of the information society is all but inevitable and at the same time the data available is greater than ever. Deriving meaning out of the available data not only creates better insight for planning, but can also impact resource allocation, quality of service and improve level of understanding of the data.

There are relatively far fewer amounts of available literature on the implementation of BI in the context of local government or the public sector in general. This includes the role BI can play in terms of allowing for easy investigation, forecasting, reporting and analysis of data obtained from the use of services and e-services provided. There are potential impacts that can be made to the benefit of both the decision makers attached to the government and the residents within the society it serves. This paper attempts to address those possibilities.

1.1.1. e-Government

The importance for managers and decision makers attached to e-government initiatives to be able to gain insight into the data that the services and e-services obtain from the residents within the community should not be deemed negligible. Having a more in-depth view of these data sources can help reveal valuable knowledge, patterns and needs of the residents within their society in an effective and efficient manner and can possibly facilitate improved decisions on how to allocate limited resources, streamline processes, improve quality of services and increase awareness of residents within their respective societies.

1.1.2 Contact Centers

CCs are an attempt to a more inclusive e-government that exposes residents of the local government it is located in to improved services and e-services. CCs attempt to improve the ability for residents to be able to contact officials and representatives of various departments to make inquiries. Järfälla municipality has a CC in place in which the municipal population can contact regarding various issues, enquiries and concerns that affect them. Pertinent information regarding residents that contact the CC such as the nature of issue, enquiry or concern, dates and so on are logged and stored in data
repositories. As the rate of residents that utilize the local government services and more importantly e-services increase, so will the amount of data. This study will attempt to investigate whether the services rendered by the CC can be improved by the implementation of a BI solution and whether or not this can impact the services and e-services provided within the municipality.

1.2 Purpose
The purpose of this paper is to investigate the role that BI can play at a local government level by investigating the CC at Järfälla municipality. Focus will be geared towards investigating how BI can help leverage the data that is collected from municipal residents who contact the CC. In this sense, the study will investigate if and how the data made available from municipal residents can be leveraged with the use of BI to impact response time and accuracy, resource utilization, planning, and quality of services and e-services. BI components such as the Extract-Transform-Load (ETL) process, Structured and Unstructured Data mining, Online Analytical Processing (OLAP), Text mining, Reporting (Static and Dynamic), Forecasting and Visualization will be investigated to help provide an outlook on how they can impact the CC as well as municipality services and e-services. Investigating and identifying the possible role and impact that BI can play with regards to the local government services at Järfälla can provide helpful insight in determining whether it is a worthy initiative to invest in.

1.3 Problem Statement
The potential increase of municipal residents due to the advent of CCs can cause an influx of data made available to municipal staff regarding their citizen’s needs, requests and concerns. Sifting through and discerning patterns or insight within this data can be potentially beneficial to the contact center, management and municipality as a whole in a myriad of ways. Investigating whether or not this is feasible will be the focus of this paper.

Though numerous studies have been done to cite the business value of BI, there has been little geared towards the context of the public sector and fewer still at a local government or municipal level. BI implementations within the government or public sector do not have as much references in literature and therefore this paper can be useful in identifying the role BI can play in that context through investigating a Swedish municipality.

1.4 Research Questions
This paper aims to investigate ways in which BI can be used to impact awareness of municipal residents, affect the provision and quality of services provided and facilitate efficient resource utilization within the municipality.
The Following research questions will be answered:

1. How can BI play a role in e-Government with regards to planning and effective utilization of resources within the municipality?
2. How can BI impact provision and quality of services and e-services at the municipality?
3. How can a BI solution impact citizen’s awareness of their municipality’s functions and activities?

1.5 Methodology

A synthesis of primary and secondary data will be used in order to help identify the role a BI solution can play within the municipal contact centers. Qualitative interviews will be the method employed for the collection of primary data and will target municipal personnel and experts knowledgeable in the area BI implementations that can provide valuable insight towards helping answer the research questions.

1.6 Disposition

Introduction

Content in this section will include the general premise of the report and discussion of the overview of the study. Concepts pertinent to BI will be discussed, as well as the CCs and their current status. Knowledge gaps in the examined literature will be identified and the motivation for pursuing this study will be explained.

Methodology

This section will provide in-depth details of the procedure adopted, justification for its selection as well as additional pertinent information such as the participants, design and materials utilized to accrue data.

Literature Research

This section will furnish an overview of the body of literature examined that helped provide a better understanding of the pertinent concepts – BI, the CCs, services and e-services. Also, the chosen theories that can best achieve useful insight in the investigation and analysis of BI’s role in the CCs will be provided. Justification and critique of the chosen theories will also be explored.

Empirical Findings and Analysis

The data accrued from the CC personnel and the other relevant experts using the selected methodology as well as the secondary data will be presented within this section. The section will also provide a critical dissection of the data obtained and from the findings and investigate any patterns dichotomies that are inherent therein.

Conclusion
The conclusion will aim to reiterate some of the key findings obtained during analysis and provide a culminating overview of how they fit into the context of the CC and local municipality and if there is any impact.

**Future Work**

This section will aim to explicate the ways in which this study can be further developed. Suggestions and recommendations vis-à-vis how the findings arrived at can be used in other research or applications will be offered.

**1.7 Delimitations**

This research does not aim to provide a holistic view of the implementation of a BI solution within municipality CCs. The aim of this research is to investigate the experiences of particular municipality CC considering a BI implementation. Measuring whether or not perceived efficacy was realized in the post-implementation phase of BI within in a CC though interesting, is out of the scope of this study.

**1.8 Research decomposition**

Figure 2 below shows the breakdown of the thesis. The initial stages included coming up with the scope and title of the thesis. The initial goal was to investigate ways BI was used within government and so focus was directed at finding a more precise scope within this area of research. Literature research was conducted to help garner knowledge on the chosen area of interest and help steer the direction of the thesis. Once appropriate conclusions had been drawn and knowledge gap identified from the available literature, a problem scope was defined. From the problem scope, research questions were designed to tackle it. Both problem area and research questions were presented to relevant stakeholders for approval and necessary updates were made to improve them. An approximation of the development schedule for the thesis was made with a time plan reflecting the complete development cycle. Research was carried out to investigate the more appropriate methodologies to adopt vis-à-vis the goals of the paper. Based on the methodology selected, problem area, and research, interview questions were developed and approved. Meetings were scheduled with key actors at the Järfälla municipality CC to get an overview of how the department functions. Further research was conducted into various theories that would be appropriate for the study and a SWOT framework was adopted to help easily aggregate, highlight, and contrast factors identified from the literature. Interviews were conducted with the selected candidates. The interviews were then transcribed and analyzed and matched against findings from the literature. Conclusions from the study were drawn and a report draft was submitted and presented. Based on presentation final updates were made prior to the final report submission.
Figure 1 Research Decomposition
2 Literature Review

Key findings from the body of literature researched will be discussed within this chapter. The purview of this chapter includes focus on and introduction of terms and concepts relevant to BI, e-Government and CCs. The body of literature researched will be reference in this section to gain insight into the current state of the above mentioned concepts. An overview of the Järfälla CCs will also be provided.

2.1 An Overview of BI

The concept of BI has been elucidated in many different ways. It has been defined as a system that serves as a combination of operational data gathering, storage of data, knowledge management with analytical tools to present information to decision makers or planners according to Negash (2004). It has been explained as having “the right access to the right data or information needed to make the right business decisions at the right time” according to Stackowiak et al. (2007, pg. 3). BI has also been defined as a process involving the converting of data into information and then into knowledge (Golfarelli, M., Rizzi, S. Cella, I., 2004). It’s been characterized as business management term which refers to applications and technologies which are used to gather, provide access to, and analyze data and information about company operations (Bălăceanu, 2007). Regardless of the semantics used in the description of BI, it is undoubtedly useful to gain insight into the data of one’s organization and being able to use that insight as leverage to different facets of an organization. According, to the definitions above, BI can help in achieving that goal.

BI is not one particular technology, but a composite of several technologies that started experiencing convergence in the late 1980’s to solve a persistent and seemingly insurmountable problem at the time which was analyzing transactional data in its raw form. Symmetrics (2011). Below is a model for BI in the Contact Center. BI architecture is usually subdivided into four main categories namely:

Operational: This is the first layer involves the transactional databases of operational systems such as ERP (Enterprise Resource Planning), CRM (Customer Relationship Management) or WFM (Work Force Management) systems that deal with the day to day operations of an organization.

Access and Staging: This second layer deals with the consolidation, integration and aggregation of data. The process of pulling the data from these disparate transactional databases in the lower layer into a consolidated repository (known as a data warehouse of data mart) is known as ETL (Extract- Transform- Load).

Data warehouse: This is the central repository that stores data from various OLTP (On-Line Transaction Processing) systems such as ERP, CRM and WFM systems. This database stores the data from disparate systems in a clean, uniform format and is used for OLAP (On-line Analytical Processing) and reporting.

Presentation and Management: This is a final layer which is the point of contact for the end users. This is typically summarized data in concise and comprehensible format from the data warehouse and comes in the form of reports, scorecards and dashboards.
Issues such as security, scheduling and distribution of content via channels such as the web, e-mail and mobile technologies are also handled in this layer.

![Diagram of BI in the Contact Center](Symmetrics, 2011)

2.2 Data Framework

Negash (2004) references Rudin and Cressy (2003) and Moss (2003) on the nature of structured and semi-structured data and BI’s need to be able handle the analysis of both. Negash (2004) describes semi-structured data as data that doesn’t fit neatly into flat files or relational files. On the other hand, data that can fit neatly into these models are known as structured data according to Negash (ibid, 2004). Below is a table consisting of different types of semi-structured data:

<table>
<thead>
<tr>
<th>Table 1 Examples of Semi-Structured Data Negash (2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business processes</strong></td>
</tr>
<tr>
<td>Chats</td>
</tr>
<tr>
<td>E-mails</td>
</tr>
<tr>
<td>Graphics</td>
</tr>
<tr>
<td>Image files</td>
</tr>
</tbody>
</table>
Negash (2004) presents an integrated framework of structured and semi-structured data and suggests this as a necessary requirement for BI. Also suggested by Negash is the equal importance of both facets of data in the process of facilitating decision makers and planners to make crucial decisions.

![BI Data Framework](image)

**Figure 3 BI Data Framework (Negash, 2004 pg. 181)**

2.3 **Tools**

2.3.1 **Reporting**

Reporting is a crucial tool of BI providing end users with easy access to data without having to directly deal with relational or multidimensional databases. Many BI vendors as a result have enabled the provision of a semantic layer between the databases and reporting tool to allow for easy manipulation of data. In this layer, databases fields are translated into objects that allow the end users to drag and drop dimensions to facilitate report development (Bălăceanu, 2007).

Report availability to the end users as provision of the right reporting tools are crucial, and neglect to this component of BI could lead to the failure of the project as a whole (Bălăceanu, 2007). According to Bălăceanu, there is a need for emphasis on a collaboration and alignment between IT and the business in order to ensure generation of robust reports that take full advantage of the BI investment.

Bălăceanu (2007) mentions 9 categories into which BI reports can be divided into which is depicted in the figure below:
### Standard reports

A standard static report that is made available to end users at a particular point in time or upon users request without the need of any further input.

### Parameter reports

These reports have a fixed layout that are available upon the request of the end users and require certain additional parameter from said users.

### Ad-hoc analysis

These are reports generated on the spot by the end-user with the starting point being from scratch, from a parameter report or from an existing standard report.

### Budgeting & target setting

This type of report is interactive and presents data from the data warehouse. This link enables modification of the data from the data warehouse though input of data on the report.
Dashboards

Dashboards are a form of report that includes aggregated data replete with Key Performance Indicators and display an overview or snapshot of how the organization is performing. Dashboards can be both static and dynamic and help in strategic decisions within the organization.

Data quality reports

Data quality reports are used to help in the tracking of the quality levels of the data in the data warehouse over a period of time.

Data mining reports

These are reports geared towards data analysts and are the results of data mining tasks. These reports are usually an integral part of the data mining tool.

IT technical reports

These are reports meant to get an overview of technical related aspects of the BI system such as load performance, query performance and number of users. This can help in proper monitoring and maintenance of the BI system.

Meta data reports

These reports are targeted at system analysts and data modelers and assist in providing insight into the data available and how it has been transformed to meet the organization’s needs.

2.3.2 BI Portal

Portals can be defined as being “responsible for providing an integrated user interface for different content and application systems” (Baars and Kemper, 2008, pg. 143). Bălăceanu (2007) describes BI portals as a single point of access within the organization to the myriad types of reports and information that can be generated from BI systems. Baars and Kemper (2008) also state that portals are useful in the realization of simultaneous and homogenous access to structured and unstructured (also known as semi-structured) data. Included within portals are applications used with “Portlets”. Baars and Kemper (2008) refer to Davydov (2001) and Priebe et al., (2003) and state that Portlets are characterized as software components that comprise of their own Graphical User Interface, occupy a section of the portal web page and communicate with the portal through pre-defined interfaces. In the figure below, Baars and Kemper (2008) suggest a model for an integrated portal that where a portlet accesses and analyzes structured data and another accesses and navigates unstructured data. This portal in essence merges the navigation in an OLAP application with search functionality that selects appropriate documents from a content management system.
2.3.3 Analysis

2.3.3.1 OLAP

On-line Analytical Processing or OLAP can be described as the methods in which users use analysis tools to slice and dice through data allowing for multidimensional and summarized views (Ranjan, 2009). According to Ranjan (2009) OLAP is used for reporting, analysis, modeling and planning in order to optimize and streamline the business. OLAP cubes (“cubes” referring to the data structure produced as a result of OLAP) use facts and dimensions that are applicable to both relational and multi-dimensional databases (Bălăceanu, 2007). OLAP tools have been very successful in scenarios in which what-if analysis, financial simulations, budgeting and target setting is required from the BI solution according to Bălăceanu (2007).

2.3.3.2 Data Mining

Fayyad, Piatetsky-Shapiro and Smyth (1996) state that data mining has assumed many different terms in the past namely, knowledge extraction, information discovery,
information harvesting, data archaeology, and data pattern processing. Fayyad et al. (1996) mention the phrase knowledge discovery in databases or KDD. There is an attempt by Fayyad et al. (1996) to distinguish between KDD and data mining, stating that KDD refers to the overall process of useful knowledge discovery while data mining is a step embedded within this process and can be characterized as an application that makes use of algorithms to extract patterns or trends from data.

### 2.3.3.3 Text Mining
Tan (1999) defines text mining as a process of extracting interesting and non-trivial patterns or knowledge from text documents. Text mining is also referred to as text data mining (or TDM) and is a slightly less prevalent aspect of data mining according to Hearst (1999). Hearst states that text holds a repository of valuable information but encodes it in a form in which it’s hard to decipher automatically. Hearst (1999) refers to Hoaglin, Mosteller and Tukey (1983) and state that text mining can also be construed as a process of exploratory data analysis. As Hearst (1999) suggests, text mining deals with the discovery of heretofore unknown information.

### 2.3.3.4 Visualization
Visualization allows decision makers to gain insight into data with the use of their natural spatial/visual abilities according to Tegarden (1999). Visualization according to Tegarden (1999, pg.6) among other things, allows for the:

- exploitation of use of the human visual system to extract data
- a visual overview of complex data sets
- identification of structure, patterns, trends, anomalies, and relationships in data,
- identification the areas of “interest”

Tegarden (1999) categorizes visualization into three distinct depicted below:
2.3.3.5 GIS

Negash (2004) describes Geographic Information Systems or GIS as a software package that is used to link databases to electronic maps for the purpose of analyzing spatial data. According to Negash (2004), a GIS is an effective BI tool in being able to exploit and present data in an easily understandable format. A system has many practical applications and in addition to collecting, storing and retrieving spatial location data, can be used identify locations, explore relations and assess alternatives in order to facilitate the decision making process. The figure below presents a screenshot of a map created within GIS system using different dimensions.
2.4 E-Government

E-Government can be described as a transformation in the fundamental relationship between government and the public through technology (Reffat, 2003; Lee, 2010). E-Government can be viewed as a different way of achieving service delivery from the Government to the citizenry through the use of Information Communication Technologies to enable and improve the efficiency with which government services are provided to the citizenry (Reffat, 2003; Carter and Bélanger, 2005; Moon, 2002). E-Government increases the access and convenience of government services to the citizenry (Carter and Bélanger, 2005). Reynolds and Regio (2001) are referenced by Reffat (2003) who mentions three perspectives that should be taken into consideration in order to achieve a successful e-Government. These perspectives are:

- **Citizen Perspective:** It is important to take into the consideration the notion of a growth in the expectations of residents, who are increasingly expecting government service delivery to be more akin to models practiced in commercial enterprises. Considering ways in which the citizenry can increase participation can help contribute to a successful and more inclusive e-Government.

- **Business Perspective:** This perspective takes into consideration commercial entities and ensuring effective and efficient channels between them and the government are implemented within the e-Government system.

- **Government Perspective:** This perspective deals with the improvement of government perception by the citizenry with the use of customer-centric initiatives and better quality of service delivery.

![Figure 8: e-Government Domains](image-url)
2.5 Contact Centers

A Contact Center or CC is an establishment that deals with customer interaction through channels such as phone calls, email and chat to name a few (Burvall, 2008). CCs are alternatively characterized as Customer Centers and Service Centers (Bernhard, 2010).

A Call Center according to Bernhard and Grundén (2010) is an institution where phone calls are handled with a complete dependency on IT. Call Centers can be insourced or outsourced (Bernhard and Grundén, 2010; Burvall, 2008). Call centers are similar to CCs and in effect perform many of the same functions. Gianforte, (2002) distinguishes CCs from Call Centers stating that though similar, CCs have a more unified set of processes that help ensure superlative customer service and optimum operational efficiency.

The CC is based on a framework that deals with handling customer interaction and delegating those interactions to the employees within the center most competent in handling them (Burvall, 2008). Employees that work within CCs are characterized using different terms, for example, Agents (Burvall, 2008), Customer Handling Officers (Grundén, 2010; Berhard, 2011) and Municipality Guides (Berhard, 2011).

2.5.1 Järfälla Contact Center

The Järfälla Kommun or municipality has a Contact Center that intended to service the over 60 000 residents that reside within the municipality. The idea behind the contact center was for it to serve as a one-stop establishment that would able to either immediately resolve issues that residents have or to refer the cases to the pertinent agencies. Two main systems are used at the Contact Center at Järfälla Kommun to deal with citizen interaction. The first is a phone system that registers information such as the number of calls made daily, the duration of calls and nature of the calls, length of calls, duration of paused calls, etc. The other system, called Flexite is a customized system designed to meet their specific needs and is used by the Agents within the CC to handle municipal residents’ interactions.

The system provides several functions for the use of the agents and information. The Agent can register information on the interaction with predefined options such as the category under which the interaction falls under and also whether the issue was handled immediately or not. There are also options for free text input in which agents can enter information on the citizen and a description of the interaction. The system is connected to a Wiki in which the Agents can access, edit, and update information for future use in interactions with municipal residents. It should also be noted that all residents who initiate interactions with the CC have the right to remain anonymous.

Interactions that cannot be handled directly by the CC are forwarded to other agencies or authorities who are better suited to deal with the issue(s). In addition to being able to call in, Residents can also drop into the CCs offices located in the center of the town. Information in this case is also registered into the system sometimes depending on the nature and importance. Interactions made online will also be handled by the CC.
3 Research Methodology

This chapter discusses issues pertinent to research methodology of this paper. Research approaches will be discussed and the chosen approach will be critiqued. Additionally, the data sources utilized for the paper will also be discussed. Research quality, validity and reliability issues will be discussed.

3.1 Research Approach

This study will be a theory-creating study which according to Järvinen (2004) results in the approximation of a new theory. He goes on to state that the result will be compared to old theories and an evaluation will be done in order to determine its ability in describing the phenomenon being studied. Under the theory-creating approach lies the case-study method which will be applied within this paper.

This study will target one municipality in Sweden (Järflå) to try and determine the role that BI can play in government services and e-services and will therefore be in the form of a case study. The case study according to Zainal (2007) can be considered to be a robust research method particularly when a holistic, in-depth investigation is required. Zainal (2007, p.2) states that in essence, “case studies explore and investigate contemporary real-life phenomenon through detailed contextual analysis of a limited number of events or conditions, and their relationships”.

Järvinen (2004) discusses two dispositions vis-à-vis structuring a theoretical study report based on selection of the inductive or deductive approach. In the light of the fact that the former will be utilized, the structure according to Järvinen (2004) is as follows:

1. Introduction
2. Selection of the method
3. Earlier empirical generalizations and studies in general
4. Analysis of background theories and assumptions
5. A creation of the new theory
6. Comparison between the new theory and the old ones
7. Discussion

Carroll and Swatman (2000) present a methodological framework below for structured-case studies. This methodological framework encompasses three main elements which are: the conceptual framework, the research cycle and the literature-based scrutiny of theory built. The integration of these three elements culminated in the framework depicted in the figure below. According to Carroll and Swatman, this framework provides an effective roadmap for interpretive research, and allows for critical evaluation of the research outcomes. The authors underline the importance of this integrated framework by stating that in addition to helping carry out the research, it also helps to document links between the research themes, data, data analysis and the theory and knowledge that has been accrued during the research process.
Järvinen (2004) refers to Webster and Watson (2002) to underscore the importance of reviewing prior relevant literature in order to create a firm foundation towards advancing knowledge. An extensive literature review was conducted to help bring clarity to the development of the theory.

**Problems with the approach**

Järvinen (2004) refers to Lee (1989) who states that 4 disadvantages to case studies exist and they are:

- making controlled observations
- making controlled deductions
- allowing for replicability
- allowing for generalizability

### 3.2 Data Sources and Data Collection Methodology

A compendium of primary and secondary data will be utilized in this study to help accrue insight in the subject area and answer the research questions. Scientific journals, whitepapers and books will serve as the crux of the secondary data. Specially designed interview questions will be tailored to help tackle the research questions of this paper. The interviews will be targeted at key stakeholders at Järfälla CC and other pertinent
The interviewees will be associated to the CCs in some capacity and/or have a good knowledge of BI.

### 3.2.1 Interview Approach

The selected method of research for this study will be qualitative and will be conducted in the form of semi-structured interviews. In the authors perspective this is the ideal way to gain knowledge from some of the key stakeholders associated to this case and some experts in this field. The interviews will be designed to be 30-40 minutes in length and will solicit data about the interviewee’s background initially but will then delve into more specific and targeted questions in relation to the research questions. An interview guide was prepared to assist the author during the interviews with the targeted group of respondents. Follow up questions were used in instances in which the original question(s) were misconstrued or inadequately answered.

The interviews will be recorded and transcribed to allow for further analysis after completion. The interviews will primarily be held in person but in cases in which this is not possible due to unforeseeable circumstances, the interviews will be held over the phone. This may pose some disadvantages with regards to not being able to notice certain niceties but in the larger perspective, can be beneficial towards gaining valuable insight that can contribute to the findings. The interview questions covered 3 main areas:

- Background
- The Contact Center
- BI

### 3.3 Data analysis

The data accumulated in the interviews will be analyzed using content analysis. SWOT analysis will be utilized to categorize the potential impacts of BI as an e-Government service in the municipality into Strengths, Weaknesses, Opportunities and Threats. Also with the use of this theory, whether or not a BI implementation will have a positive neutral or negative impact on the CC service and the municipality will be determined.

### 3.4 Other Approaches

#### 3.4.1 Theory-Testing Longitudinal study

Järvinen (2004, p. 61) refers to Ruspini (1999) and defines theory-testing longitudinal studies as being comprised of 4 main components which are:

- data collected from items or variables from two or more distinct periods
- Similarity or comparability of the cases or subjects from one time period to the next.
- comparison of data in the analysis
• several types of data can be regarded as longitudinal

Järvinen (2004) mentions Ruspini’s (1999) three pronged classification of longitudinal studies which are:

• Repeated cross-sectional studies
• Prospective studies
• Retrospective studies

This method is not appropriate for the study due to the fact that time timeline required for completion is short in relation to the time required for a longitudinal study. Also the scope of this study does not extend to examining trends, items or variables from two distinct periods. Additionally, Järvinen (2004) states that Ruspini’s (1999) view of longitudinal surveys include extensive qualitative and quantitative approaches and this is not the case in this particular study as only a qualitative approach will be utilized to solicit data.

3.4.2 Innovation Building

According to Järvinen (2004), innovation building approach is a method that falls under research that stresses utility of innovations. Järvinen (2004), states that a particular information systems development method will be applied to the research method. Evaluation of the innovation according to Järvinen (2004) then proceeds with the comparison of the final state that has been reached with the goal state that was set at the beginning with the possible use of performance metrics and criteria to facilitate measurement and detect discrepancies and similarities between the two states. Though BI and its use within e-Government may be viewed to some as an innovation, the scope of this study is misaligned to this method due to the fact that the BI system is not implemented and therefore measurement of performance or other criteria is not feasible.

3.5 Research Quality

An effort was made to ensure the quality of this paper with emphasis on data collection interpretation and analysis of the findings. Research validity and reliability are two key tenets of the quality of a research paper and were acknowledged throughout the development of this paper. According to Yin (1994), the former refers to whether the intended measurements of the paper are indeed what are being measured while the former refers to repeatability of the results of the findings.

3.5.1 Validity

The questions selected for the interviews were designed in a manner to ensure they were concise and pertinent to the research questions of the study. These considerations helped to ensure that what was intended to be measured was indeed being measured thereby bolstering the validity of the study.

The interviews were recorded in with a high quality tape recorder when conducted in person and when via phone (i.e. skype), an add-on was used to record the conversations. The respondents were notified of the recording prior to the commencement of the interviews.
An expansive literature research was conducted in the case of accruement of the secondary data across different disciplines at times so as to ensure that consistent elements were selected to be included within the SWOT framework.

3.5.2 Reliability

During the analysis section where description and interpretations of the interviews were conducted, attempts to bolster the reliability were made by quoting some of the correspondence from the interviews. This would help to ensure that in addition to interpreting the data, factual reflections of the respondents were included in the paper.
4 Frame of reference

The chapter aims to focus on the discussion of SWOT analysis framework and how it will be used in assessing the impact BI tools can play within the Contact Center. Also included within this chapter will be identification of potential benefits and drawbacks drawn from the literature.

4.1 SWOT Framework

SWOT (Strengths, Weaknesses, Opportunities and Threats) is one of the most analytical tools for strategic planning used in measuring the strategic position of an organization when planning (Piercy and Giles, 1989). Pickton and Wright (1998, pg. 103) state that “SWOT analysis involves the collection and portrayal of information about internal and external factors which have, or may have, an impact on business.” The framework provides a simplistic and easy to understand structure to sort ideas for an organization’s future and its ability to exploit that future (Piercy and Giles, 1989). Below are three major motivations as to why SWOT is such a popular tool for analysis (Piercy and Giles, 1989):

- the technique is simple enough to be readily and easily available to managers
- extensive corporate or market information systems aren’t essential to the model’s use
- the model enables structuring of quantitative and qualitative information, familiar and unfamiliar facts, and known and half-known understandings

Lee (2010) proposes a five step plan depicted below in which a SWOT analysis is the primary step:

![Five step strategic planning process](image)

Figure 10 Five step strategic planning process. Lee (2010, pg.3)
4.1.1 Modified SWOT Framework

Ranjit (2008) modified the original SWOT analysis model from its traditional use of assisting organizations to evaluate tools and techniques. SWOT analysis usually evaluates the internal aspects of the organization (using the strengths and weaknesses quadrants) as well as the organization’s external environment i.e. its market or industry (using the opportunities and threats quadrants) Ranjit (2008). The model as mentioned earlier was modified by Ranjit (2008) with regards to the questions and their evaluation of tools and techniques. The modified model is depicted in the figure below:

![Figure 11 Modified SWOT framework Ranjit (2008)]
| **Author** |
|---|---|---|---|---|---|---|

### Strengths of BI

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Comments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase data Quality</td>
<td>✓</td>
</tr>
<tr>
<td>Increased Efficiency of Customer Service</td>
<td>✓</td>
</tr>
<tr>
<td>Optimization of the processes</td>
<td>✓</td>
</tr>
<tr>
<td>Time Reduction between queries and responses</td>
<td>✓</td>
</tr>
<tr>
<td>Training Costs Reduction</td>
<td>✓</td>
</tr>
<tr>
<td>Faster access to data</td>
<td>✓</td>
</tr>
<tr>
<td>Increased user productivity</td>
<td>✓</td>
</tr>
<tr>
<td>Increased IT productivity</td>
<td>✓</td>
</tr>
<tr>
<td>Increased organization efficiency</td>
<td>✓</td>
</tr>
<tr>
<td>Improved customer support</td>
<td>✓</td>
</tr>
<tr>
<td>Estimating and Forecasting</td>
<td>✓</td>
</tr>
<tr>
<td>Trend analysis – planning and determining strategies</td>
<td>✓</td>
</tr>
</tbody>
</table>

#### Reporting

<table>
<thead>
<tr>
<th><strong>Sub-features</strong></th>
<th><strong>Comments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad-hoc Reporting</td>
<td>✓</td>
</tr>
<tr>
<td>Rich reporting capacity</td>
<td>✓</td>
</tr>
<tr>
<td>Improved tracking of citizen enquiries/issues</td>
<td>✓</td>
</tr>
<tr>
<td>Integration of disparate systems</td>
<td>✓</td>
</tr>
<tr>
<td>Monitoring and compliance to standards and rules</td>
<td>✓</td>
</tr>
<tr>
<td>Reduced cost of ‘information analysis’</td>
<td>✓</td>
</tr>
<tr>
<td>Enterprise wide data driven decision making capability</td>
<td>✓</td>
</tr>
<tr>
<td>Table 2 Strengths of BI</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Availability of data analysis tool (Time series, trend, variance)</td>
<td>✓</td>
</tr>
<tr>
<td>Risk mitigation</td>
<td>✓</td>
</tr>
<tr>
<td>Deeper data insight</td>
<td>✓</td>
</tr>
<tr>
<td>Improved Governance</td>
<td>✓</td>
</tr>
<tr>
<td>Data availability readiness</td>
<td>✓</td>
</tr>
<tr>
<td>Effective decision making</td>
<td>✓</td>
</tr>
<tr>
<td>Improved Enterprise performance</td>
<td>✓</td>
</tr>
<tr>
<td>Single version of the truth</td>
<td>✓</td>
</tr>
<tr>
<td>Current and accurate information</td>
<td>✓</td>
</tr>
<tr>
<td>Integrated platform and applications</td>
<td>✓</td>
</tr>
<tr>
<td>Secure and personalized user experience</td>
<td>✓</td>
</tr>
<tr>
<td>Collaborative environment</td>
<td>✓</td>
</tr>
<tr>
<td>Total solution that is cost effective and comprehensive</td>
<td>✓</td>
</tr>
<tr>
<td>Easy conversion of business knowledge</td>
<td>✓</td>
</tr>
<tr>
<td>Rapid problem detection</td>
<td>✓</td>
</tr>
<tr>
<td>Depth and breadth</td>
<td>✓</td>
</tr>
<tr>
<td>System Neutrality</td>
<td>✓</td>
</tr>
<tr>
<td>Customizability</td>
<td>✓</td>
</tr>
<tr>
<td>User-determined parameters for analysis</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Weaknesses of BI</strong></td>
<td>Author</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------</td>
</tr>
<tr>
<td>High upfront and set up costs</td>
<td>Khan, Amin and Lambrou (2010)</td>
</tr>
<tr>
<td>Data Security</td>
<td>Moon (2002)</td>
</tr>
<tr>
<td>Data Latency</td>
<td>Dawes (2002)</td>
</tr>
<tr>
<td>BI project complexity</td>
<td>Ballou and Tayi (1998)</td>
</tr>
<tr>
<td>High costs of OLAP based systems</td>
<td>Ballou and Tayi (1999)</td>
</tr>
<tr>
<td>Lack of complete BI suite offerings</td>
<td>Ndou (2004)</td>
</tr>
<tr>
<td>Typical BI systems not optimized for OLTP</td>
<td></td>
</tr>
<tr>
<td>Complexities of Data Management and Data Warehouse</td>
<td></td>
</tr>
<tr>
<td>Fragmented data sources in the enterprise</td>
<td></td>
</tr>
<tr>
<td>Organizing to satisfy customers and residents</td>
<td></td>
</tr>
<tr>
<td>Changing the culture</td>
<td></td>
</tr>
<tr>
<td>Measuring and improving performance</td>
<td></td>
</tr>
<tr>
<td>Learning how best to buy BI</td>
<td></td>
</tr>
<tr>
<td>Privacy</td>
<td></td>
</tr>
<tr>
<td>Taking decisions in a dynamic environment</td>
<td></td>
</tr>
<tr>
<td>Questionable final data quality</td>
<td></td>
</tr>
<tr>
<td>Relationships in the data warehouse may not be optimized for all different user groups</td>
<td></td>
</tr>
<tr>
<td>Data warehouses generally do not store historical data</td>
<td></td>
</tr>
<tr>
<td>Queries can take a long time to run</td>
<td></td>
</tr>
<tr>
<td>IT departments have data warehouses but only</td>
<td></td>
</tr>
<tr>
<td>Table 3</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Weaknesses of BI</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Author</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities of BI</strong></td>
<td></td>
</tr>
<tr>
<td>Quality of service delivery to businesses and customers</td>
<td>✓</td>
</tr>
<tr>
<td>Transparency, anticorruption, accountability</td>
<td>✓</td>
</tr>
<tr>
<td>Increase the capacity of government</td>
<td>✓</td>
</tr>
<tr>
<td>Network and community creation</td>
<td>✓</td>
</tr>
<tr>
<td>Improve the quality of decision making</td>
<td>✓</td>
</tr>
<tr>
<td>Analyze click-stream data to improve e-Government strategies.</td>
<td>✓</td>
</tr>
<tr>
<td>Determine what services customers are likely to request and when.</td>
<td>✓</td>
</tr>
<tr>
<td>Reduce case conclusion by applying predictive analytics</td>
<td>✓</td>
</tr>
<tr>
<td>Better Understanding of customer requirements</td>
<td>✓</td>
</tr>
<tr>
<td>Improved efficiency in service delivery</td>
<td>✓</td>
</tr>
<tr>
<td>Better staff productivity and satisfaction</td>
<td>✓</td>
</tr>
<tr>
<td>Improved customer satisfaction</td>
<td>✓</td>
</tr>
</tbody>
</table>

specialists can access them

Queries done out of BI systems can be cumbersome and time-consuming to run for end users

Data analysts and business intelligence tools do not directly improve service
Greater commitment to democratic institutions

| superior e-Government infrastructure | ✓ |

**Table 4 Opportunities of BI**

<table>
<thead>
<tr>
<th>Author</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Negash (2004)</td>
<td></td>
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<tr>
<td>Computerworld (2003)</td>
<td></td>
</tr>
<tr>
<td>Ndou (2004)</td>
<td></td>
</tr>
<tr>
<td>Gangadharan and Swami (2004)</td>
<td></td>
</tr>
<tr>
<td>Dawes (1996)</td>
<td></td>
</tr>
<tr>
<td>Dawes (1999)</td>
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<td>Johnstone and Toy (1999)</td>
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</tr>
<tr>
<td>DeLone and McLean (1992)</td>
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<tr>
<td>DeLone and McLean (1993)</td>
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<td>Moon (2002)</td>
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<td>Payne (2002)</td>
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<td>Irvine (2000)</td>
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<td>Jiang and Netland (2001)</td>
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<td>Chinagula-Smith and Duchesne (1999)</td>
<td></td>
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<tr>
<td>Hoe (2002)</td>
<td></td>
</tr>
<tr>
<td>Dawes and Nelson (1995)</td>
<td></td>
</tr>
<tr>
<td>Heintze and Bretheunder (2000)</td>
<td></td>
</tr>
<tr>
<td>Davis (1992)</td>
<td></td>
</tr>
<tr>
<td>Henschel (2009)</td>
<td></td>
</tr>
</tbody>
</table>

**Threats of BI**

- Easy creation and consumption of reports ✓
- Secure delivery of the information ✓
- Friendly user interface ✓
- Assess ROI prior to installation ✓
- ICT infrastructure (e-readiness, computer literacy, telecommunication equipment)
- Policy issues (legislation)
- Human capital development and lifelong learning (skills, capabilities, education, learning)
- Change management (culture, resistance to change) ✓
- Partnership and collaboration (public/private partnership, community and network creation) ✓
- Strategy (vision, mission) ✓
- Leadership role (motivate, involve, influence, support)
- Providing access to extensive resources from devices with limited capacity ✓
- Benchmarks and performance targets ✓
- Creating a new information infrastructure to support the development and deployment of multiple applications ✓
- Integrating to existing enterprise I legacy systems and connecting with multiple networks ✓
- Creating solutions that perform in and out of both network coverage and managing the solution ✓
<table>
<thead>
<tr>
<th>Threat</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcing security and role-defined access to the data warehouse</td>
<td>✓</td>
</tr>
<tr>
<td>Information and data quality</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Usability</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Security issues</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Technological incompatibility</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Technology complexity</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Technical skills and experience</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Technology newness</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Manager’s attitudes and Behavior</td>
<td>✓</td>
</tr>
<tr>
<td>Users or organizational Diversity</td>
<td>✓</td>
</tr>
<tr>
<td>Lack of alignment of organizational goals and project</td>
<td>✓</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>✓</td>
</tr>
<tr>
<td>Restrictive laws and Regulations</td>
<td>✓</td>
</tr>
<tr>
<td>Intergovernmental Relationships</td>
<td>✓</td>
</tr>
<tr>
<td>Privacy concerns</td>
<td>✓</td>
</tr>
<tr>
<td>Autonomy of agencies</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Lack of support from executives or business management</td>
<td>✓</td>
</tr>
<tr>
<td>Poor planning or management of BI programs</td>
<td>✓</td>
</tr>
<tr>
<td>Lack of BI technology standards and best practices</td>
<td>✓</td>
</tr>
<tr>
<td>Lack of training for end users</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 5 Threats of BI
5 Empirical Results & Analysis

This chapter aims to identify findings from the interviews and literature that contributed to the SWOT framework. An investigation as to whether correlations between the two sources can be found will also be conducted.

5.1 Strengths

One of the strengths of implementing a BI solution cited by Peter Rosgren (personal communication, 2011-05-02) is that it would lead to better tracking of the calls and improve the length of time cases took to get handled. At the time of the interview, the phone system, which residents utilized to lodge complaints, provide, or enquire information, and so on, and the system used to create tickets for each issue, were disparate and unlinked. Gaining insight into the relationship through a BI solution would be advantageous according to him. Rosgren further states that most of the staff at the Järfalla CC is interested in the figures and analysis a BI solution could help yield to help prepare for different scenarios. He states “…for example, when they have vacations or something, it will be a lot easier to plan the vacations with some kind of support from the system”.

These insights are pertinent to some of the strengths identified in the literature. Ghilic-Micu et al. (2008) mentions Improved customer support and also states Increased Efficiency of Customer Service along with Khan et al. (2010) as strengths of using BI. Khan et al. (2010) further indicates Deeper data insight as a strength of BI. Putting these strengths in the context of the CC, with the use of BI, snow related issues for example, mentioned by both Peter Rosgren (personal communication, 2011-05-02) and Martin Gellerstedt (personal communication, 2011-04-28) could be handled in a more efficient manner. Such an issue is a good example and likely to affect a multitude of residents and insight into information such as the number of affected residents and, worst affected areas, could help CC staff respond in a more efficient manner to the concerned residents.

Lennart Östblom (personal communication, 2011-05-04) states “…it is my belief that if you track down all these patterns it also will become easier for the people that work in the CCs to give better answers so it will be easier for them in their work…” Ranjan (2009) corroborates this by citing rapid problem detection as a strength of BI, presenting the argument that it could be an effective tool in being able to provide data that would help identify these issues before they become problems.

Gangadharan and Swami (2004), and Khan et al. (2010) mention Trend analysis and Estimating and Forecasting as strengths of utilizing BI. The ability to estimate and forecast the depth and extent of recurring scenarios such as seasonal issues mentioned by Peter Rosgren (personal communication, 2011-05-02) based on previous statistics, will allow for better planning ahead on the part of the CC and its affiliated agencies.

There are additional strengths with the help of a BI solution that can be realized so as to improve the organizational efficiency of the CC. Peter Rosgren (personal communication, 2011-05-02) states that a BI solution would make it “easier to see when people are calling for example, and how many are calling and for what are they calling about then you can put in extra people in those spots exactly…”.
Martin Gellerstedt (personal communication, 2011-04-28) bolsters this notion stating “For being able to refine procedures and routines you must have a good picture over the current situation."

This mirrors findings in the literature such as Increased organization efficiency from Ghilic-Micu et al. (2008) and Khan et al. (2010), Improved tracking of citizen enquiries/issues from Gangadharan and Swami (2004), and Improved Enterprise performance Khan et al. (2010). Ghilic-Micu et al. (2008) also cite Optimization of the processes as a strength of BI.

Peter Rosgren (personal communication, 2011-05-02) goes on to state that “…it’s a lot easier if you have a great BI system so that you can give a great service when people need it and when people don’t need too many employees sitting waiting to take some calls. It would be a lot more efficient and a better service for everyone. I think that you can track down many patterns of what people are asking for and what they would like to know and why they are contacting the municipality”.

Lennart Östblom (personal communication, 2011-05-04) states, “…if we have 200 people asking for something within a limited period of time I think we should sit down and try to analyze what we could do better for these people, why are they calling so frequently etc…”. Estimating and Forecasting cited by both Gangadharan and Swami (2004) and Khan et al. (2010) is an identified strength of BI that could help in realizing this.

Martin Gellerstedt (personal communication, 2011-04-28) in response to whether or not a BI solution would have an impact on municipal residents states “Quicker response to problems. More important or problems of a certain magnitude are changed faster…” This correlates with rhetoric from Ghilic-Micu et al. (2008) who cite Time Reduction between queries and responses as a strength of BI.

Lennart Östblom (personal communication, 2011-05-04) states, “…If you use that information I think it’s possible to create a better government if you are really interested in changing the way the government were now this could be a very good help to try to make it better”. This is echoed by Khan et al. (2010) who mentions Improved Governance as a strength of BI.

Martin Gellerstedt (personal communication, 2011-04-28) states with regards to the effect of a BI solution that “A good structure and a system could be helpful as facts for making decisions”. This is in line with findings from Khan et al. (2010) who cite Effective decision making as a strength of BI. Gellerstedt also makes mention of another strength of BI - the ability to easily create reports - stating “I also think that it is a good idea to have a system which could generate reports and statistics easily, and then the personnel could focus on working with improvement rather than taking care of unstructured non-understandable data.” Gangadharan and Swami (2004) as well as Khan et al. (2010) mention Reporting as a strength of BI which helps bolster this standpoint.

Gellerstedt (personal communication, 2011-04-28) provides further evidence for strengths of implementing a BI solution stating, “…in all kinds of organizations I think that it is common that the management/employees believe that they know what their customers and customer attitudes. But from my experience, hard facts data often emphasize problems, or contradict old beliefs or expectations.” This correlates with
findings in the literature with Khan et al. (2010) citing Single version of the truth and Current and accurate information.

5.2 Weaknesses

Peter Rosgren (personal communication, 2011-05-02) provides a good example of how a potential implementation of a BI solution at the Contact Center could face challenges. On the issue of having Contact Center staff providing consistent answers to the same question he states, “…we haven’t any system to check that they give the right answer. That is something that we should work on or find some kind of way perhaps listening to them or sitting with them to see if they do the same thing… so it’s a quality work that we have to do”.

This statement raises an potential issue consistent with findings in the literature from Dawes (1996), and Ballou and Tayi, (1998; 1999) who state that Questionable final data quality is a weakness of BI. Not being able to ascertain the consistency of the responses provided by the CC representatives, may affect any data acquired from the municipal residents, which would in turn affect the Quality of the BI analysis that results from it.

Gellerstedt (personal communication, 2011-04-28) states, “…dissatisfied customers (residents) are more likely to contact the center (complaining) than satisfied customers calling and praising the municipality… A complaining BI-system could be rather pessimistic and create negative feelings – and is not that representative. On the other hand it is important to take care of complaints”. The Hewson Group Report (2002) mentions Organizing to satisfy customers and residents as a potential weakness of BI and is in line with Gellerstedt’s statement. Questionable final data quality mentioned by Dawes (1996), and Ballou and Tayi, (1998; 1999) also lends credence to Gellerstedt’s statement.

5.3 Opportunities

Lennart Östblom (personal communication, 2011-05-04) alludes to the ability of a BI solution to create better insight into the ways of working within the CC stating, “…from the analysis where you can see that there is something that is not working properly and to actually have the organization change how you deal with these questions…” This rhetoric is corroborated by Ndou (2004) who cites Transparency, anticorruption, accountability as potential opportunities of implementing a BI solution.

Martin Gellerstedt (personal communication, 2011-04-28) states, “A good structure and a system could be helpful as facts for making decisions. It is much easier to make a change or argue for a change, if you have hard facts”. Parallels can be drawn between Gellerstedt’s statement and Ndou’s (2004) who highlights Improves the quality of decision making as an opportunity of BI.

Lennart Östblom (personal communication, 2011-05-04) provides a possible opportunity that a BI implementation at the CC could result in, stating “I think a lot of people are calling the contact center for opening hours of different services like library or bath houses or the waste collection. And when you use a tool where you can find in a
period of time 400 questions about these opening hours, maybe this is something that you should try to advertise somewhere more regularly…”

Rhetoric supporting opportunities of this nature is well-referenced in the literature with Ndou (2004) stating Quality of service delivery to businesses and customers. Ranjan (2009) also cites Reduce case conclusion by applying predictive analytics and Determining what services customers are likely to request and when as potential opportunities of a BI implementation. The Hewson Group Report (2002) mentions Improved customer satisfaction as an opportunity of BI which also lends credence to Östblom’s statements.

Martin Gellerstedt (personal communication, 2011-04-28) states that another opportunity of implementing a BI solution at a municipal CC would be the ability to “understand the customers”, which in this case, are the municipal residents. This idea is supported by the Hewson Group Report (2002) which mentions Better Understanding of customer requirements as an opportunity of BI.

5.4 Threats

Peter Rosgren (personal communication, 2011-05-02) identifies a potential threat to the efficacy of using a BI solution at the CC. He alludes to the fact that the CC is hindered from getting certain exact figures stating “we’re not allowed to track who is calling us, we don’t even have the right to record the phone numbers residents are calling from so that is the problem in that case.” Since residents have the right to anonymity, this could pose a threat towards leveraging an effective BI solution.

Rosgren’s point reflects findings from the literature. Ndou (2004) mentions Policy Issues, Chengalur-Smith and Duchessi (1999) cite Restrictive laws and Regulations while Moon (2002) identifies Privacy concerns as threats to an effective BI solution. These identified threats buttress the notion that policy does indeed affect the way in which information can be collected from municipal residents and can ultimately pose as an obstruction to the effectiveness of an implemented BI solution at a CC.

Lennart Östblom (personal communication, 2011-05-04) alludes to potential challenges of implementing a BI solution at the Contact Center stating “…that could include moving people from one department to another or firing people because they are not doing what they should do…HR issues will occur most definitely, also organizational issues I think…” This rhetoric is corroborated by Ndou (2004) who mentions Change management as a possible threat to BI.

Peter Rosgren (personal communication, 2011-05-02) states that though the CC is intended as a central point of contact for issues and enquires that residents have, depending on the nature, some cases get forwarded to other agencies. Rosgren believes that it would be difficult to leverage a BI solution with regards to the transferred cases, stating “… I think it would be great to connect, but it is such a big problem because there are a lot of people who are depending on the old system.” This dependency of many members of staff from different agencies within the municipality on older and sometimes completely different systems can potentially increase the challenges of integrating a new BI solution across different agencies. Rosgren goes on to state, “they often have their systems and they take some kind of report out of our system and put it
into their system... so it’s so many different systems and we can’t integrate all these into one because it becomes too complicated.”

Rosgren’s statements on possible threats to a BI solution at the CC are corroborated by several findings within the literature. Dawes (1996) and Landsbergen and Wolken (2001) mention Autonomy of agencies. They further identify Technological incompatibility as a threat to a BI implementation. Ndou (2004) mentions Partnership and collaboration as potential threats while Landsbergen and Wolken (2001) have a similar take citing Intergovernmental Relationships.

Lennart Östblom (personal communication, 2011-05-04) also touches on the issue of variegated departments within the municipality and the potential threat it could pose to a BI implementation stating “…each department has their own money and budgets and sometimes they think that they are in control of what they are doing just by themselves, but if these new ideas come from a different part of the municipality then they might not be willing to adopt that way of working.”

Peter Rosgren (personal communication, 2011-05-02) believes that on the whole, getting end users, which in this case are the CC staff to use BI tools would not be a problem. He however goes on to state that employees that have been working for 30 years or more may greater proclivity towards maintaining the status quo way of working. The statements posited by both Östblom and Rosgren are corroborated by Dawes and Nelson (1995) who cite Resistance to change and Dawes (1996) who cites Autonomy of agencies as potential threats to BI.

Peter Rosgren (personal communication, 2011-05-02) also mentions another threat of a BI solution in the context of the Järfälla Contact Center. Rosgren states, “When you connect the BI system to for example Flexite, the Flexite database will require a lot more work to change something in it. I think that could be some problem…” Flexite as mentioned earlier is the ticketing system used at the Järfälla CC. Gangadharan and Swami (2004) cite Integrating to existing enterprise legacy systems and connecting with multiple networks as a potential threat of BI.
6 Conclusion

This chapter aims to conclude findings from the literature and interviews and surmise the analysis of the study. Research questions which helped steer the focus of this study will be answered in this section. Limitations and ideas for future research will also be discussed within this chapter.

6.1 Research Questions

RQ1: How can BI play a role in e-Government with regards to planning and effective utilization of resources within the municipality?

BI can play a role in helping to gain better insight into what the municipal residents’ needs are, and, the times in which they are needed. Having this information allows decision makers at the CCs and municipality to make more knowledgeable decisions and provides foresight to be able to plan more effectively to implement non-existent services and improve the quality of existing services for its residents.

As mentioned earlier, the success or failure of services, processes, ways of working, and resource allocation become more transparent with the help of a BI implementation at the municipality. The proposal of greater accountability by itself may help encourage an improvement in the effective utilization of resources. However more importantly, a BI solution should be able to provide decision makers with relevant information and hard facts to enable them to provide better quality services for the municipal residents.

RQ2: How can BI impact provision and quality of services and e-services at the municipality?

Findings from this study help to show that a BI implementation can allow the Contact Center and Municipal department as a whole to learn more about its residents. A BI implementation can help decision makers know what their residents want or need which can in turn help improve the quality of living within the municipality.

The CC as mentioned earlier, serves as a focal point for which residents can ask questions, lodge comments, complaints, and recommendations. Looking at the data accrued from the CC on a regular basis with the use of a BI solution can help to get a better view of the problems and issues facing municipal residents. This data can invariably help bolster the argument for when change to the status quo is needed. A BI solution can also help to measure and determine if the strategies adopted and services or e-services implemented have proved successful or not.

RQ3: How can a BI solution impact citizen’s awareness of their municipality’s functions and activities?

A BI solution can help to identify the knowledge gap that may exist on the part of the municipal resident’s vis-à-vis functions and activities of the municipality. Data accrued from the CC and leveraged with the help of BI can potentially help to underscore the need to better inform residents of the municipality.

A BI solution can provide concrete figures, trends and analysis that are a direct reflection of what the municipal residents are sufficiently or insufficiently informed about. This knowledge can help decision makers in determining whether there’s need to better propagate information of the municipality’s functions and activities. If the
knowledge gap that exists is sufficient enough, and the need for change supported by the relevant decision makers, increased propagation of the municipality’s activities and functions via social networks, local media and mobile apps would be effective ways of closing the knowledge gap.

6.2 Discussion / Implications

Findings from this study reveal that the potential benefits of implementing a BI solution at the Contact Center outweigh the drawbacks. Though BI is a relatively new tool in government compared to the private sector, it is an effective tool that can be used in that context to leverage great value even at the municipal level. The advent of the CC within municipalities is a great precedent and, when tethered with a BI solution, could make for a very effective service to create and improve other services and e-services.

A BI tool can help provide structure and make sense of data that may otherwise seem incoherent and disparate. If for instance, residents keep informing the CC of overcrowding in a particular school, this could be an oversight that was missed by the relevant authorities. Having hard facts and information will indubitably help to substantiate the need for a better strategy, resource allocation and planning.

The author is of the opinion that though benefits can be realized in the short term also, an implementation of a BI solution in the CC is likely to realize value in the mid- to long-term. BI solutions have the potential of helping to optimizing processes, improve resource planning and provide better quality services and e-services. These benefits may take time to realize in both the CC and municipality departments, but it is of the author’s opinion that is worthwhile.

6.3 Limitations & Reflection

The focus of this study was directed at the CC of one municipality - Järfälla Kommun. The author feels the study would have been further enriched with the inclusion of more municipalities. Learning what other CCs experience vis-à-vis BI solutions and whether or not they vary from one municipality to the next, would have provided even more insight.

Also in addition to investigating other CCs, the author feels it would be good to investigate both municipalities that have implemented a BI solution, and those considering or planning for an implementation.

Though factors like budget allocation, structure of agencies, population, etc… will vary from one municipality to the next, it is the author’s belief that the implementation of BI systems within CCs can have a positive impact on the service provision, resource allocation and process efficiency within municipalities.
6.4 Future Research

The area of BI’s role within municipalities and with CCs is a wide and still relatively unexplored field. Investigating over time how CCs that have adopted BI solutions have transitioned will help to enrich the field greatly.

A larger sample of CCs within disparate municipalities should be researched to investigate the techniques utilized and to analyze whether or not similarities can be drawn from the different experiences. It would also be good to investigate whether information obtained from BI analyses at CCs has been used to effectuate change in services provided and resource allocation. Research at CCs that have employed other techniques to improve services and e-services for municipal residents will also be interesting to explore.

Further research should be conducted on cheaper tools and easier ways to implement BI solutions with a focus on use in CCs. This is so as to provide viable alternatives to municipalities that may be considering implementing such a solution but are deterred due to the financial limitations.

Another good area of research would be to look into the actual data that CCs receive over an extended period of time and see what analysis can be derived from a particular CC. The results should be measured against other CCs to see how the analysis compares against other CCs.

Investigating ways in which a virtual Contact Center can be implemented would also be a good area of research. Investigating whether it can solicit responses from a wider audience of municipal residents and be effectively leveraged with a BI solution could help contribute to this field.
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INTERVIEW QUESTIONS
Appendix

Background

1. Could you tell me about your position and job role?
2. How long have you been in this position?
3. What is your professional background?

The Contact Center

1. How many employees work at the contact center?
2. Could you tell me how the processes at the contact center works?
3. Could you give me some examples of issues the contact center deals with on a daily basis?
4. How long has the contact center been running for?
5. What was the motivation for establishing the contact center?
6. Roughly how many citizens would you estimate use the contact center services?
7. What would you say is generally the nature of the correspondence?
8. In what ways would you say the contact center has been impactful to residents of the municipality?
9. Could you tell me a little bit about the system that you use?
10. In what manner do you register the calls?
11. What database do you use?
12. How do you categorize the fields within the database?
13. How are service requests or enquires tracked at the contact center if they cannot be resolved immediately?
14. Have you experienced any challenges of catering to the needs of the citizens at the contact center?
15. Do you feel there are ways in which the current system could be improved?

Olawale Adelakun
Business Intelligence

16. Have you dealt with Business Intelligence in the past or presently? If so, in what capacity?
17. Do you currently use any means of detecting trends or patterns from the data logged by the staff? If so, how?
18. Do you think there would be any opportunities or advantages to implementing a BI solution at the contact center? If so, what would they be?
19. Do you think there would be any challenges or disadvantages to implementing a BI solution at the contact center? If so, what would they be?
20. Do you feel the implementation of a BI solution would affect the end users (contact center personnel)? If so, in what ways?
21. What BI tools in particular do you think would be most suitable for the contact center and gaining insight into the data?
22. Do you believe the impact of a BI implementation at the contact center would be realized in the short or long term?
23. Would you say that BI would have an overall positive or negative effect on the contact center and municipality as a whole?

Olawale Adelakun
Peter Rosgren Interview

Could you tell me about your position and job role?

My Responsibility here at the customer center is as a Systems Developer for example, Wiki, Knowledge Base, ticketing system and computers in general.

How long have you been in this position at the contact center?

For 1 and half year I think, since last December.

What is your professional background?

I’ve been working with computers since 2002 with a lot of different problems e.g. I have been in building automation for 5 or 6 years and industrial automation for a couple of years. So that is my background. Customer service is totally new for me.

Firstly how many employees work there?

Between 25 – 35.

Could you tell me about how the processes at the contact center work?

Well it depends on what process you mean..is it when someone makes a call to when it is completed?

Yes.

Ok, so when a customer calls the tickets are recorded in our case Flexite and if they can give an answer directly the tickets are closed right after the call. But if they can’t give a direct answer, they can either send it to someone else to answer or they can take the ticket themselves, and then they can look up the answer and contact to the customer again.

Could you give me some examples of issues that the contact center deals with on a daily basis?

It depends on what time of year it is for example, in the winter we got a lot of snow problems, in spring a lot of sand and things that are lying under the snow and it is also depending on if there are a lot of invoices that are sent out that aligns with different applications and things like that. But I think that it is a lot of e.g. the kindergarten where I am here could be one question that comes almost every day. It’s such a wide area so its harder to say what and when different questions come.

How long has the contact center been running for?

About a year. (2010)

What was the motivation for establishing the contact center?
To check if the residents could more easily be in contact with us.

Before we started only 30 – 40% of the calls were answered, the rest were dropped off somewhere… so that is the main reason for us being established.

Roughly how many residents would you estimate use the contact center services?

We don’t have any figures exactly because we’re not allowed to track who is calling us, we don’t even have the right to record the phone numbers people are calling from so that is the problem in that case… So I can’t really say.

In what way would you say that the contact center has been in helpful to the residents of the municipality?

It’s a lot easier to get in touch with us. It was easier to connect with the municipality after we opened up all the phones as they had a lot more work. The biggest impact was that it was a lot easier to get an answer. Before we started there was only 30-40% of the calls that were answered and that was the only figure we had. But now we know how many calls that are getting answered and how many are getting through. We also knew what and when people are asking about something… so we can be prepared when the call us. If we know that we have sent out a lot of invoices its easy to know that on this and this dates we should get a lot of calls about this, and its easy to be prepared about those kinds of questions. So it’s a lot better service for the residents.

Is it one direct phone number?

Yes. There is one direct phone number and then short cut options like 1 for this.. 2 for this and so on.

Depending on what the nature of the issue is?

Yes. Exactly. I think there are 3 different choices that they can make at the moment.

You told me earlier that the system that you use is Flexite, could you tell me a little more about it and maybe why you selected it?

It was a lot for the money and a lot of others are using it in the same kind of work that we do so it is easy to fit the system into the kind of problems that we have. It doesn’t always have all the function that we need today but in the long term we think we can make the owner of the system to tune the system in the way that we want. A lot of the systems are made to register a lot of tickets but not in the way we do it. We have a lot of different areas and so many different people to send the tickets to. So that’s why it has to be so easy, the system or we can’t use it. I have done some math about it and with just one more click it is going to be 10,000 clicks per year for one agent. So it has to be so easy that in maybe 5 clicks the ticket should be ready to be finished.

So optimization is still required with the system?

Yes a lot of optimization I think, but at the same time if you buy a system with a lot of features already, then you can’t make them specially fitted for you. We experience that a lot of the same problems with the other municipalities and when we get enough pressure behind our needs I think they will implement those. That is why we have thought about this system.
So the current system was specifically customized for the contact center?

No not really, it’s some kind of ticketing system at the moment but it’s not exactly tuned for the customer service and that is the bad part about it.

What database do you use?

It is Microsoft SQL Server. I don’t know which version it is though.

How do you categorize the fields within the database?

I don’t know, depends on how deep in the database you mean. I don’t have complete overview of what the database looks like but it works dynamically in accordance to how the system works. So it’s not fixed tables.

What are the types of categories that the contact center register when they are handling a case?

There are 4 different levels at the moment. Level 1 is the Local administration (förvaltning) Level 2 has to do with what department and division while 3 and 4 have to do with what it is about. Then it depends on how much statistics or figures we need.

How are service requests tracked at the contact center if they cant be resolved immediately?

Then we either park the ticket or we send it to the local administration (förvaltning) and after we send it to förvaltning, it’s up to them to do it and how they solve it.

So you transfer the case if it can’t be handled or if it’s better handled by a different agency to them and then they take it from there?

Yes, exactly. And they often have their systems and they take some kind of report out of our system and put it into their system e.g. the social department want some extra money or someone is about to build an extra house. So it’s so many different systems and we can’t integrate all these into one else it becomes too complicated.

Have you ever faced any challenges to catering of the needs of the residents at the contact center?

Yes in the beginning there were a lot of problems, we did not have such a good knowledge base, with new people just hired… that was a problem. And how to know if everyone gets the same answer… if the customer calls twice for example, with the same question, then it’s very important that the customer gets the same answer. That was one big problem in the beginning. But during this all year it’s just been about tuning the system and getting everything up and running. Now we got something to work with and hopefully now, everything is exactly how we want it. in the beginning and I knew people who were senior and they had a lot of problems in the beginning. Problems like how do you know if the customer will be given the same answer if he calls twice for example with the same question. It is very important that the company give the same
answer. We have been trying to solve these problems and hopefully by December this year everything will be exactly like we wanted it.

How did you overcome the problem of providing the same answer regardless of how many times a customer called?

We started to have meetings once a week and discuss with each other how we deal with this kind of issue and how we deal with that… this and how to do that and there were different answers depending on for what they were calling for. But we haven’t any system to check that they give the right answer. That is something that we should work on or find some kind of way perhaps listening to them or sitting with them to see if they do the same thing… so it’s a quality work that we have to do.

Could you talk a little about the knowledge base as well, how does that work?

At the moment we are trying to use a Wiki. But when you have been answering phone calls for a month or two you begin to learn what to say. With the bigger companies you usually learn what to say… and how do you change the knowledge that is in the head? It’s easy to change the knowledge in the knowledge base but how do you highlight it for the agents if something has changed? That’s the hard part… the human being is pretty lazy… you usually don’t do more than you need to so if you know the answer, you don’t look it up. And also the categories that are in Flexite are connected to the wiki. So when they categorize the ticket they also narrow the search in the knowledge base. That’s how it works today but there is still a lot of work that needs to be done in that area.

Have you dealt with business intelligence in the past or presently?

No, I have been in contact with it when I worked with it arbetsförmedlingen… there I have been in touch with the business intelligence systems.

Do you currently use any means of detecting trends or patterns or analysis from the data logged by the staff?

We have some key figures that we are looking at but no so many… at the moment we are trying to find what to look after. We really do not know exactly what we and what we want to look at. But in the future maybe we will have some standing points that we are looking at maybe once a week, or maybe on a daily basis.

Do you think there are any opportunities or advantages for implementing a BI solution at the contact center?

Absolutely. I think we must have some kind of BI system to connect the phone and the Flexite and to see who is answering what and how long do different calls take… Today we look in the phone system and look at one agent and for example see that they took 2 calls in between 8 and 9 for example and then we look at Flexite during the same time and then we can connect the calls with the ticket… If it were 2 calls for example and 1 took 5 minutes and 1 took 3 minutes and the calls were about this and that. But we don’t know which one of those calls were 5 and which one was 3 minutes. There’s no way to connect these two at the moment – if you don’t look at the time exactly, so you can see that’s when the call came in and that’s when the ticket was created… Then you can put them together a little bit better. However the ticket can be created after the call, because the tickets are created by the humans while the phone system is automated. But it’s
quite interesting if you look at the agent level and see how long they take and when they are made and... but its a lot of work, it has to be automated in some ways... I don’t know how but, that’s in the future too.

Do you think there would be any disadvantages or challenges of implementing a BI system at the contact center? Not really. When you connect the BI system to for example Flexite, the Flexite database will require a lot more work to change something in it. I think that could be some problem... but I don’t know how databases are built in Flexite for example if you change one category in Flexite, what happens in the BI system in that case. We’d like a lot of integrations but the more you integrate the more you are locked in and it’s hard to see how this responds to different changes.

I also wanted to ask that the fact that some of the cases get transferred to other agencies. Do you think that would be a problem if a BI system was implemented to get the statistics on those transferred cases?

I think it would be great... The more you see and how people are working you can automate to make their process a lot more efficient... I think it would be great to connect, but it is such a big problem because there are a lot of people who are depending on the old system. So its one step at a time. However I think that in the future tax payers will want their money to be used as efficiently as possible and then you need to have some kind of system to check that everybody are doing what they are supposed to do and are giving the residents the right answers at the right time. So I think that it is a must in the future and so see how all the processes are working together, not just my department but you should look at all the department together.

Do you feel that the implementation of a BI system would affect the end users?

Yes I think so. But I think it is a lot easier to see when people are calling for example and how many are calling and for what are they calling about then you can put in extra people in those spots exactly. But it’s a lot easier if you have a great BI system so that you can give a great service when people need it and when people don’t need too many employees sitting waiting to take some calls. It would be a lot more efficient and a better service for everyone.

Do you think it would be a problem getting the end users to use BI tools?

No I don’t think so. Its always a question of education and the will to use it. That’s the hard part. A lot of the employees here are old and say since the employees say that they we have been doing like this for 30 years and we will do it like this until we die... That’s a lot of employees...so then its hard to get them to use it. But all the bosses I think would like it.

The staff at the Contact Center are interested in those figures and Contact Centers I think would like to see what's happening so then they can prepare different scenarios. For example, when they have vacations or something, it will be a lot easier to plan the vacations with some kind of support from the system. Maybe in a year or two we can start planning for the staff to be more efficient.

Are there any specific BI tools that you think would be more suitable for the contact center?
Appendix

No I haven’t been looking at any tools at the moment. I know that they have had a project here at Järfälla and looked at four different systems and also I think they bought one of them but they have not implemented it yet, so maybe this year or the next. We may have some kind of system but they need to define what do we need from that system.

Do you believe that the impact of a BI implementation at the contact center would be realized in the short or long term?

I think both. It’s a lot easier to plan if we can compare the figures with each other. So it is both short and long term. I think a lot of short term problems will be solved and a lot of long term problems also if that’s what you mean. So it’s a lot easier to plan for the day when the employees are going for lunch and also a lot easier to plan on how the vacations are for example in the next half year. So therefore it’s both long and short term.

Would you say that BI would have an overall positive or negative effect on the contact center and the municipality as a whole?

It’s hard to see where the problems are but in the long term you have to know where the problems are before you can fix them. So it can be hard to see the reality in the beginning but in the long term I think it’s just getting better and you know where the problems are. It is also easier to follow up on what is happening and to determine if it got better or did it get worse. So I think it’s positive so long as everybody is doing what they should and those that are not doing what they should are then highlighted. So depending on what kind of approach you have I think in the end it is positive. I don’t see any negative effects at all.

Peter: Do you have any suggestions on what you think could be the reality?

Wale: Well i mean when you mentioned earlier that most of the people at the contact center would be spoken to using a BI then that would overcome like a major challenge because if it were the case where you said like you have been doing it for 30 years and this is how I will do it till I die then the overall impact could be negative or just no impact at all in improving anything at the contact center. I think that if the willingness is there then the overall outlook should be positive.

Peter: yes, most of the staff here at the contact center are pretty open minded so I think its overall a great opportunity to see as they are already asking me for a lot of figures about different “what if” situations so I think that they are really interested in seeing what is happening. Also for the work environment I think it’s great to know when during the day the most calls comes for example so that no one is on a coffee break at that time and so it becomes easier to plan their own time. I think that is a positive effect too. Its hard to know as we have not really had any of these BI systems yet and what we could get out of it and how it can connect all the data. Today I am putting it together manually and it is a lot of work.
Interview 2 - Lennart Östblom

Could you tell me about your position and job role? (Regarding Sambruk)

Well I am the overall project leader for the contact center project. And my role there right now is to fulfill the ambitions that were set up in the beginning of the project. I came in very late in the project so I have only been there 2 months. But the remaining steps in the project until the end of the project in late fall in November will be to set up an e-learning possibility for all the people that work in the contact centers. That is one thing and the other thing is to make a guide for municipalities who want to start a contact center and Per Flensburg he has that duty to make that guide. I am actually just supervising those different issues. But I also have a certain interest in taking a further step in this contact center project because we would like to take advantage of all the data these contact centers acquire and we talked about that, that this is my role to see if there is any possibility to prolong this project and to make it even better.

What is your professional background?

Well I have been a planner at the municipality for a long time. I’ve had many different positions at the Sandviken municipality. I’ve been the area manager and I have been the IT manager for a period of time I have been the chief administrative officer for some time, I have been a planner and so forth. So I have had a lot of different positions in the municipality.

How long have you been working with the municipality?

I have been working for 30 years.

Have you dealt with business intelligence in the past or presently and if so in what capacity?

Well I have not, because this is something that municipalities really don’t work with. At least not in the way they use the word business intelligence. We might use it in some context but not by using the word business intelligence though.

Do you think that Business Intelligence has a role to play in e-government?

Yes absolutely. Because I think we are focusing not at all on these matters and I think that the contact centers could be a way to lead us into that process which I think is necessary in order to develop e-government to play an important role because if we don’t create value with e-government someone else is going to take over that can create a better value somewhere else.
Do you believe that there would be any opportunities or advantages of implementing a business intelligence solution at the contact center?

Yes I do and I think that you can track down many patterns of what people are asking for and what they would like to know and why they are contacting the municipality. If you use that information I think it’s possible to create a better government if you are really interested in changing the way the government were now this could be a very good help to try to make it better. We will have the arguments if we have 200 people asking for something within a limited period of time I think we should sit down and try to analyze what we could do better for these people, why are they calling so frequently etc.

So do you think the advantages would be more towards the municipality residents or the contact center staff or a mixture of both?

Well hopefully a mixture of both. Because it is my belief that if you track down all these patterns it also will become easier for the people that work in the contact centers to give better answers so it will be easier for them in their work. Also if you have other patterns that show that there is something that is not so good in the government then you can change that so that it is better. It will make it easier for the citizen to get the help that they need. For instance by these patterns if you can create a new service that is very easy to get to, then they don’t have to call the contact center in order to have the service delivered. So I think it’s a mixture.

Do you believe that there would be any challenges or disadvantages in implementing a BI solution at the contact center?

Yes I think there are challenges and I think it is going from the analysis where you can see that there is something that is not working properly and to actually have the organization change how you deal with these questions, I mean that could include moving people from one department to another or firing people because they are not doing what they should do, I mean things like that. HR issues will occur most definitely, also organizational issues I think. And those are the difficult questions. And I think questions dealing with different departments… each department has their own money and budgets and sometimes they think that they are in control of what they are doing just by themselves, but if these new ideas come from a different part of the municipality then they might not be willing to adopt that way of working. So that is also a challenge for the top management of the municipality.

You mentioned earlier with regards to maybe creating an e-service for the residents so that they wouldn’t necessarily have to contact the Contact Center, but do you think that there
would be any other sort of impact whether direct or indirect in the way that the residents interact with the Contact Center with the help of BI?

Yes I can give you an example. I think a lot of people are calling the contact center for opening hours of different services like library or bath houses or the waste collection. And when you use a tool where you can find in a period of time 400 questions about these opening hours, maybe this is something that you should try to advertise somewhere more regularly like in newspapers or maybe you should make a certain special application for that or maybe you should have it on the first page of the municipality’s website. The website I think has to be changed according to the results of the BI. And if you call that direct or indirect impact I don’t know but those are some examples that I think could come out of this. And when you have the BI then that is a very good argument, you have the facts about what happened and you can take some measures to actually change these things to make it better.

Do you think that there are any BI tools in particular that would be more suitable for a municipal contact center to gain insight to find these trends in the data?

I don’t really have the knowledge about BI so I don’t think that I can say that. I don’t really know what is included in what is called BI.
Interview 3 Martin Gellerstedt

Could you tell me about your position and job role?

Assistant professor in informatics, specialized in statistics and data mining

How long have you been in this position?

Been teaching and researching for two decades

What is your professional background?

Statistician

Have you dealt with Business Intelligence in the past or presently? In what capacity?

I developed a master program in business administration and analyses, a program focusing on data warehouse, data mining and statistics.

Do you think Business Intelligence has a role to play in e-Government?

Absolutely, don’t waste the gold mine of data!

Do you believe there would be any opportunities or advantages of implementing a BI solution at a municipal contact center? If so, what would they be?

- Well, in all kinds of organizations I think that it is common that the management/employees believe that they know what their customers and customer attitudes. But from my experience, hard facts data often emphasize problems, or contradict old beliefs or expectations. Common comments are: “I didn’t know that this was a problem”, “I was aware of this problem but not the magnitude of the problem and how important it seems to be”.

- Using data could help management to:
  o Understand the customers
  o Prioritize
  o Take decisions based on facts rather than guesses
  o Quality control
  o Benchmarking – e.g. comparing snow shoveling (and complains) in different areas
Appendix

Do you believe there would be any challenges or disadvantages to implementing a BI solution at a municipal contact center? If so, what would they be?

From my point of view there are some statistical challenges. Remember that dissatisfied customers (residents) are more likely to contact the center (complaining) than satisfied customers calling and praising the municipality… A “complaining BI-system could be rather pessimistic and create negative feelings – and is not that representative. On the other hand it is important to take care of complains (see theory “critical events”). For getting a more representative picture it is important to use random surveys “customer satisfaction questionnaire” etc as a complement.

Do you feel the implementation of a BI solution would affect the end users (i.e. contact center personnel)? If so, in what ways?

A good structure and a system could be helpful as facts for making decisions. It is much easier to make a change or argue for a change, if you have hard facts. Another gain is to get help with prioritization. For being able to refine procedures and routines you must have a good picture over the current situation. Improving step by step (kaizen) has been shown successful. I also think that it is a good idea to have a system which could generate reports and statistics easily, and then the personnel could focus on working with improvement rather than taking care of unstructured non-understandable data.

Do you think the implementation of a BI solution would have any direct or indirect impact on the municipal residents? If so, what would they be?

Quicker respons to problems. More important or problems of a certain magnitude is changed faster. Also appreciated that someone is listening and taking good care of the data. I would guess that it is a good idea to frequently present what changes action that has been taken due to the BI-system – that would encourage further use (which will work in the opposite direction if nothing happens…). It is also a good idea to be aware of different areas and the pros and cons with different areas (from residents perspective) this is good information for becoming residents. If the expectation is fulfilled it is more likely to keep the customer for a longer time.

Do you think there are any BI tools in particular that would be most suitable for a municipal contact center to help gain insight into the data generated there?
Appendix

I would guess that simple descriptive statistics in terms of quickly produced tables (most common complains, etc) and graphs would be a starting tool. It would be a little bit more sophisticated to build in OLAP-cubes and get the possibility to play around with the data. More advanced methods like Neural network and fancy statistical models could be used in future, but are overkill to start with. I also believe that it would be a good idea to have a information platform for gathering different “quality measurements”, like the contact center BI-system, citizen satisfaction questionnaires, etc.. All different kinds of information related to customers and quality should be in one place.

Do you believe the impact of a BI implementation at municipal contact center could be realized in the short or long term?

To get a first simple system going is easily managed I would guess 3-4 weeks work. But to create routines for how to use the system, integrate it with other information in a platform etc is a long term activity… Take it step by step. The important thing is that the first system must show value and trigger developing the system further.

Would you say that BI would have an overall positive or negative effect on a municipal contact center and municipality as a whole?

Since the information is available I would say that using the information with a small BI-system and transforming the data to useful information would easily pass break even in costs.