Process Improvement Strategy for Public Sector Organizations

A Case study at Linköping Municipality - MoS department

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Abstract

The public-sector organizations have been in limelight for research work about the implementation of various quality management approaches with the evolution of process management ideology into this sector. The awareness among the citizens regarding their rights and demand for qualitative service has been increased which led to the focus on the quality management approaches like Six Sigma and Lean. The public-sector organizations such as municipalities, health care, social administrators and others are not driven by profits unlike private sectors making it complex to implement these approaches. This led to the purpose of the thesis to research on proposing a process improvement strategy for increased customer satisfaction in the public sector. Seven tools from Lean and Six Sigma methodologies have been chosen to propose the strategy and they are – Process Mapping, Voice of the Customer, Critical to Quality, Cause & Effect Analysis, 5 Why’s, Benchmarking and Standardization.

To execute this research, a qualitative case study methodology has been conducted at MoS department of Linköping Municipality on one of their ground process – customer request handling process. The research questions were designed to understand how to map the process, the customer orientation and process efficiency specific to the case and finally grasp the effectiveness of the selected tools for public sector. Various data sources were collected for this study. The empirical findings led to interesting analysis and discussion on the case study in relation to the previous literatures reviewed in this area. Moreover, the usefulness of these tools has been clearly identified and the strategy for process improvements has been proposed.

From the overall discussion, major conclusions on the thesis work have been made with respect to the research questions. Firstly, while mapping the process it is important to consider the customer perspective and identify the process steps which lead to customer satisfaction. Further, communication with the customers and considering their feedback for future improvements is identified to be vital. Finally, the selected tools contribute majorly for the process improvements in public sector where the numerical data availability is limited and the importance of the strategic order for the tools has been highlighted.

Key words:
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>Kommun</td>
<td>-</td>
<td>Municipality</td>
</tr>
<tr>
<td>Miljö och samhällsbyggnadsförvaltningen</td>
<td>MoS</td>
<td>The Department of Environment and Urban Planning</td>
</tr>
<tr>
<td>Sveriges Kommuner och Landsting</td>
<td>SKL</td>
<td>Swedish Association of Local Authorities and Regions</td>
</tr>
<tr>
<td>Kommunstyrelsen</td>
<td>-</td>
<td>Municipal Executive Committee</td>
</tr>
<tr>
<td>Samhällsbyggnadsnämden</td>
<td>-</td>
<td>The committee for Urban Planning</td>
</tr>
<tr>
<td>Bygg och Miljönämnden</td>
<td>-</td>
<td>The committee for Buildings and the Environment</td>
</tr>
<tr>
<td>Kontor</td>
<td>-</td>
<td>Office</td>
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<tr>
<td>Plankontoret</td>
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<td>Planning Office</td>
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<tr>
<td>Stadsmiljökontoret</td>
<td>UEO</td>
<td>Urban Environment Office</td>
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<tr>
<td>Bygglovskontoret</td>
<td>-</td>
<td>Building Permits Office</td>
</tr>
<tr>
<td>Miljökontoret</td>
<td>-</td>
<td>Public Health and Environment Office</td>
</tr>
<tr>
<td>Kommunlantmäteriet</td>
<td>-</td>
<td>Municipal Surveying Office</td>
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<tr>
<td>Kontoret för verksamhetsstöd</td>
<td>-</td>
<td>Administrative Support Functions office</td>
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<tr>
<td>Blankett</td>
<td>-</td>
<td>Application Form</td>
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<tr>
<td>New Public Management</td>
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<tr>
<td>Lean Six Sigma</td>
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<td>Total Quality Management</td>
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<td>Critical to Quality</td>
<td>CTQ</td>
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<td>Voice of the Customer</td>
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1 Introduction

The introduction chapter is about the background of the thesis and the focus of the study area. The purpose, research questions and delimitations will be presented, followed by an outline about the structure of the report.

1.1 Background and Problem Description

In the recent days, the concept of quality of service has become important in public sectors as the people have become aware of their rights for quality in services (Haa & Lee, 2010). The municipal services which come under the public sector are criticized for being slow and inefficient leading to citizen dissatisfaction (Maleyeff, 2007). Further, there is lack of competition when it comes to municipalities as they are the solo service providers for the citizens (Haa & Lee, 2010; Bhatia & John, 2008). The citizens get dissatisfied when their needs and expectations are not fulfilled. To deliver services according to the customers’ needs, the organizations usually follow certain processes. The purpose of these processes is to transfer the operational inputs into certain outputs that satisfy their customers (Bergman & Klefsjö, 2010). Therefore, the municipal organizations need to continuously analyze and update their processes according to their customers’ needs and expectations. A sense of requirement and importance has been observed in the public sector for the process improvements as the citizens are no longer ready to accept whatever service is provided by the government (Haa & Lee, 2010). Instead they have clear opinions of what is their right and how to get it done correctly.

With the evolution of New Public Management (NPM), which stressed that the public sectors should import managerial processes from the private sectors led to the increased focus of public sectors towards efficiency and customer focus (Boyne, 2002). The purpose is to create a market driven culture in the public sector (Boyne, 2002). This kind of focus shift enables public sectors to follow various process management approaches. A well-designed process increases the effectiveness and efficiency which creates value for the customer and result in the reduced costs for the company (Boutros & Purdie, 2014; Wagenhelm & Reurink, 1991; Jurisch, et al., 2014). In order to improve the processes, there are well-known management approaches and methodologies such as Total Quality Management (TQM), Six Sigma, Lean, Business Process Re-engineering (BPR), ISO 9001 and many more.

Lean and Six Sigma are two process improvement methodologies which are being used together as Lean Six Sigma methodology since the 2000’s (Cole, 2011). Six Sigma focuses on reduction in the process variations, while Lean focuses on the elimination of the wasteful activities in a process (Cole, 2011). Despite of the differences in the roots of these two methodologies, they hold some common features such as customer satisfaction, customer focus, employee involvement and increase in efficiency of the processes using tools (Maleyeff, 2007). Further, these methodologies consist of various tools that can be used individually for process improvements. The combination of the two methodologies has led to Lean Six Sigma (LSS) process improvements in many kinds of organizations like manufacturing and service industry.
The research has been taking place in the public sectors such as health care, police administration, social administrations and few municipalities for using LSS. So, considering this evolution and above-mentioned changes within public sector/municipalities, the thesis is focused on taking inspiration from Lean and Six Sigma methodologies. Cole (2011), mention that first focus on the waste reduction and then on the variation in a process, while implementing Lean Six Sigma for first time in an organization. But, the focus of this thesis is neither implementation of any of the methodologies nor combined approach of them. It focuses on using tools from these methodologies to improve a process within the case study company Linköping Municipality - MoS department.

Linköping municipality is one fifth largest municipality which provides various services to the citizens of the municipality. Miljö och samhällsbyggnadsförvaltningen (MoS) is department responsible for providing infrastructural facilities, traffic and services related to them to the citizens of the municipality (Linköping, 2017). During autumn 2017, MoS collaborated with Linköping university’s Quality Management department to perform a Six Sigma project. It was about timely closing of the citizen requests registered in their internal ticket handling system called Flexite. The author along with a co-student successfully conducted the project on two categories which had the problems and developed solutions. The organization was satisfied with the results which was appreciated by MoS employees and management. During the project it has been observed that the process of customer requests handling process varies among each division with respect to routines and standards. Thus, the background of the thesis has been developed with an idea about considering the entire customer request handling process at MoS department and investigating about their customer orientation.

The MoS department has been divided into six offices, which are further divided into branches/divisional group with again individual sub-groups and sub-categories resulting in a complex organizational structure. The organization has been described in detail in Chapter 4. They want to update their process in order to have improved service quality for the customers. Therefore, the department would like to review their internal processes. As the organization structure is quite big and complex, to begin with this review, the department decided to first have an internal process analysis of the customer request handling process. The customers of the process are the citizens, company owners, politicians and internal customers of the municipality. However, in order to narrow down the scope of the thesis, the customer request process with respect to one of the functional office – Stadsmiljökontoret: The Urban Environment Office (UEO) has been chosen to perform an in-depth analysis.

The office is divided into divisions and group – Urban Environment, Operation & Maintenance, and Public Transportation. They have been dedicated for the development of Linköping municipality’s public places, traffic, operational and maintenance issues. The process begins with a request or complaint from the customers, related to the municipality’s maintenance, public transport or infrastructure issues and goes further for processing and solution. As the problems are related to the public in general, the expectations and needs of the customers varies widely. So, the department want to know the status of their process, if they are efficient in
meeting the customer expectations and what more can be done in order to have increased service quality.

Currently, the MoS department has goals for increased customer satisfaction, service quality improvements in their business operations plan, but no standard procedure or methods have been established on how to achieve the improvements (Linköping, 2017). Therefore, this thesis attempts to provide inspiration for improvements from the well-known Quality Management methods - Six Sigma and Lean approaches commonly used in process improvements. Further, the tools - process mapping, Voice of the Customer (VOC), Critical to Quality (CTQ), Ishikawa - cause and effect analysis, 5 Why’s, standardization and benchmarking have been selected from these approaches and used for process improvement strategy within the case company.

1.2 Purpose and Research Questions

The purpose of the thesis is to suggest a process improvement strategy for increased customer satisfaction with the help of some tools from Six Sigma and Lean for the public-sector organizations. To achieve this purpose, a case study on the customer request handling process at MoS department of Linköping municipality has been conducted. The following Research Questions (RQ) have been used as a base for this study:

RQ1: How to map the customer request handling process at the case study organization?

RQ2: How is the customer orientation at the case study organization? To what extent does the current process meet the customer requirements and needs?

RQ3: How could the tools contribute to process improvements in public-sector organizations?

1.3 Delimitations

The following limitations have been identified for this case study:

1. The customer request handling process is limited to Urban Environment Office only.
2. The process improvements focused on the organization’s internal process, which means the external service providers such as entrepreneurs working for MoS were not considered.
3. The customer interviews were limited to citizens and company owners which means that the process customers are delimited to citizens and company owners of the municipality.
4. The thesis study does not cover the requests that needs committee decisions.
5. The quantitative study has been limited to historic survey and issues registered from the internal ticket handling systems.
6. The implementation of the suggested process improvements has not been included in this study.
1.4 Outline of the Report

An overview about the structure of the report has been presented in this section. The report has been divided into eight chapters and an appendix chapter. A brief description about the contents in each chapter has been given so that the reader can have a clear picture about the focus areas.

➢ **Chapter 1: Introduction**
   This chapter consists of introduction and background of the thesis. The chapter is divided into sub sections which include details about brief introduction to the case organization, purpose and research questions; followed by problem description and the delimitations. Lastly, an outline about the structure of the thesis work.

➢ **Chapter 2: Theoretical Frame of Reference**
   This chapter covers a detailed explanation about the literatures reviewed, concepts, and description about how to use the selected tools. These theories will be further used to discuss about the empirical findings.

➢ **Chapter 3: Methodology**
   This chapter presents about the choice of method, how the research will be carried out, and the types of the data collected for the analysis. It also covers about the analysis of the data and the credibility of the study.

➢ **Chapter 4: Empirical Findings**
   This chapter gives insights about the background of the organization in which the case study is performed. It consists of the organization’s structure, detailed description about the UEO office, customer requests handling process status in relation to customer requirements. The results will be from the data collection sources such as interviews, observations and internal documents studied.

➢ **Chapter 5: Analysis**
   An analysis on the empirical findings will be presented in this chapter. The analysis focuses on the purpose of the study, which is the strategy for the process improvements. The root cause analysis of the problems followed by the improvement suggestions will be provided based on the analysis.

➢ **Chapter 6: Discussion**
   This chapter presents the details about how the results are connected to the theoretical frame of reference. A discussion about the empirical findings, analysis, selected tools, and methodology will be included in this chapter.
➢ **Chapter 7: Conclusion and Future Work**
This chapter provides a conclusion for the thesis research work. The answers to the research questions conclude the study. Finally, the author’s insights for the possible future work in this area will also be presented.

➢ **Chapter 8: References**
This is the last part of the report where all the references that have been used in the report will be given.

➢ **Appendix**
The appendix consists of information such as interview questions, and some data that has been used for the problem identification.


2 Theoretical Frame of Reference

During the thesis study, various literature studies and previous research work about process management with respect to public sector have been examined. This chapter introduces to the reader about theories on quality, customer focus and processes with respect to public sector, followed by process and process management concepts. Then process improvements in public sector context, Lean and Six Sigma in public sector will be discussed. The last section consists of description about the tools selected from Lean and Six Sigma with information about their application will be presented.

2.1 Quality

The term **Quality** has become predominant since decades and the definition has evolved into various contexts. From the number of definitions, author chose the definition given by Bergman & Klefsjö (2010, p. 23): “the quality of a product (goods or services) is its ability to satisfy, or preferably exceed, the needs and expectations of the customers”. From this definition it is understandable that the quality concept revolves around the customers who receive the final products or services from the business owners. One of the earliest research on service quality was by Parasuraman et.al., (1985), where the authors presented ten dimensions of service quality to be Access, Communication, Competence, Courtesy, Credibility, Reliability, Responsiveness, Security, Tangibles, and Understanding the customer. The nature of the services is unique because of the absence of physical entities and are usually driven by the customer requirements (Parasuraman, et al., 1985). Later, based on these service quality dimensions, Lovelock & Gummesson (2004) explained the distinguishing characteristics of services to be:

- Intangibility - which is the absence of physical products,
- Inseparability – where the service is produced and consumed simultaneously,
- Variability – services are dependent on human resources,
- Perishability – services cannot be stored,
- Lack of ownership – services are not physical and therefore product is neither exchanged nor owned.

The absence of physical appearance of the services makes it difficult to evaluate how the services are perceived by the customers (Parasuraman, et al., 1985). The inseparability nature of services is that the production and consumption happen simultaneously by the consumer and therefore, it is important to ensure that the service is delivered rightly with quality (Lovelock & Gummesson, 2004). In the case of public sector, the citizens are the customers who are different individuals seeking specific services varied from each other (Boyne, 2002). This variation leads to the definition of quality in the public sector to be complicated. However, Morgan & Murgatroyd (1995), argue that the quality with respect to public sector is no different from other service sectors as all of them fall under service providers. One can imply these dimensions and
characteristics to public services such as municipal service organizations irrespective of the type of services offered (Morgan & Murgatroyd, 1995).

2.1.1 Customer Focus

The customer focus concept is considered to be important in quality management of products or services (Bergman & Klefsjö, 2010). Similar to the complexity in the definition of quality in public sector, the concept of customer is also considered to be complicated because often it is complex to define who is the customer to the process (Fountain, 2001). This complexity is because of the lack of agreement in the public sector about the term that applies to the people they serve (Alford & John, 2002). There are variations in addressing the receivers of the service in public sector and some of the titles are: customer, client, consumer, user, stakeholder, citizen, tax payer, or the public (Alford & John, 2002). However, Jurisch, et al., (2014), mentions that the customers in the municipalities are politicians, business owners and the citizens, however they are termed the stakeholders remain to be the mentioned people. Also, Alford (2002), mentions that the customer typology can be categorized into two types – citizens and clients; further he adds that customers are the individuals who pay for the services, but in public sector as they don’t pay anything and for this reason they should be seen as beneficiaries (Alford & John, 2002).

Irrespective of the term used for the customer in public sector, focus on providing their needs and expectations is important and this determines the quality of the services in public sector (Boyne, 2002). Also, there should be a strong desire for the public-sector agents to serve their customers, but they are criticized for interest in the politics of the public-sector rather than its management (Fountain, 2001). To have increased customer focus, the organizations should encourage their employees to review the process of service delivery and they should be changed according to the customer requirements (Bergman & Klefsjö, 2010). Generally, the citizen requirements vary largely and can be considered to be dynamic in nature (Fountain, 2001). In the municipalities, the customers’ needs, and expectations vary from citizen to citizen and the organizations should be ready to handle these varied requirements. Additionally, Jurisch, et al., (2014), strongly suggest that the public-sector organizations should become more customer centric in order to be efficient in their service delivery. This monopoly of the public-sector result in the low customer focus and thus one can say the public sectors are led by the suppliers rather than the customers unlike in private sector services (Bhatia & John, 2008).

2.1.2 Processes

The nature of the public-sector service processes is similar to the private service processes (Morgan & Murgatroyd, 1995). Similar to the complexity in defining the concepts of quality and customer in public sector, the process definition also remains unstated. This is because, the processes are driven by political agendas, laws and regulations. Further, the political agendas which in turn reach as goals to the public-sector services become vague when applied in the organizational processes (Boyne, 2002). Thus, the processes in the public sector are authority driven and not market driven. The objects in the processes are not tangible and the involvement of the customer is very huge in the public-sector service processes.
According to Jurisch, et al., (2014), to ensure the financial, social, and political challenges, the public-sector organizations should be always improving their service processes by imbibing the private sector approaches according to the organizational culture. On the other hand, Gulledge Jr & Sommer (2002) argue that in order to imbibe process management orientation in the public sector, there are difficulties with respect to organizational structure and culture which are not in favor of implementing process management. Further, they stress that the main problem with the public sector is that they are governed by law and it mandates the process management (Gulledge Jr & Sommer, 2002). Bhatia & John (2008), mention that the public-sector managers sometimes lack the skills, experience, and mind-set to take process management.

A typical top-down management, lack of managerial interest in understanding the importance or value of operational processes makes it difficult to implement process management in public sector (Bhatia & John, 2008). In addition to these, the systems should be aligned with the processes in order to have a process orientation in the public sector. But, most of the times inappropriate decision systems and new information technologies which are not aligned with processes results in ineffective process management (Gulledge Jr & Sommer, 2002). However, there are case studies and literatures which show that process management with respect to process improvements succeeded in the public sector, which will be discussed further in the next sections of this chapter.

### 2.2 Process and Process Management

There are many definitions for the term ‘process’, but the definition chosen by the author has been given by Bergman & Klefsjö (2014, p. 456) – “a process is a network of activities that are repeated in time, whose objective is to create value to external or internal customers”.

The process can exist when there is a need for a product or service and the existence of services/products and processes are interdependent on each other (Harrington, 1991). These processes use the resources such as people, tools to transfer the input which is the initial activity to the output which is the final activity (Boutros & Purdie, 2014). The steps between the input and output are the value adding steps such as which are the process steps (Bergman & Klefsjö, 2010). An illustration of the process has been presented in the figure 1, below.

**Figure 1: Process flow from Supplier to Customer**

*Source: (Bergman & Klefsjö, 2010)*

Boutros & Purdie (2014), mention that the processes have continuous workflows, set of instructions that add value to an organization’s customers - where, the customers are both internal and external customers. The processes are classified into three categories: Main Process, Support Process and Management Process (Bergman & Klefsjö, 2010). The division
of the processes into these levels helps the business owners and the staff to streamline their operations (Boutros & Purdie, 2014).

**Main Process**: These are the core processes who concentrate on providing the customers their services or products. The customers of main process are usually the external customers (Bergman & Klefsjö, 2010).

**Support Process**: The support process acts as helping systems to the main process whose customers are the internal customers such as the employees of the organization (Bergman & Klefsjö, 2010).

**Management Process**: The management process consists of the decision makers for the strategic planning, targets and goals (Bergman & Klefsjö, 2010; Boutros & Purdie, 2014).

The importance of process orientation led to the development of process management methodology, which is identified as a vital approach for quality improvements (Bergman & Klefsjö, 2010). The management of processes are considered to help in quality improvements and if processes are unregulated, they tend to change which will not be in the best interest of the external customers (Harrington, 1991). Therefore, it is always required to make continuous improvements in process management. There are many literatures from the above which discuss about process management in relation to quality improvements. However, the process management implementation given by Cronemyr (2007) has been chosen, which is as followed:

1. **Process Development**: This is defined as the first step where the process owners, process leader are appointed and the process is mapped for the initialization the process.
2. **Process Improvements**: This step, the process is analyzed by using improvement approaches, with the help of the available data.
3. **Process Control**: This step can be identified as the state where the process is monitored to be in control.

The second phase which is the process improvement step is used in this thesis where some methodologies that are in practice such as Lean and Six Sigma have been identified. This will be further discussed in the following sections of this chapter.

### 2.3 Public Sector Context

There are many kinds of organizations in public sectors such as health care, education, police administration, municipality services, and social welfare. The nature of public sector is that there are not profit organizations owned by entrepreneurs or business stakeholders. As mentioned earlier, the services are not provided in exchange of profits such as money by the municipalities, instead the finances are rotated from the tax money (Haa & Lee, 2010). According to Boyne (2002), the public sectors distinguish from the traditional private sectors mainly due to ownership because public sectors are owned by collective members of political communities where private sectors have shareholders. On the other hand, the public sectors are funded by taxation unlike the fees paid by customers in private sector and finally public sectors are politics driven unlike private sectors market driven (Boyne, 2002). Further, Jurisch et.al,
Theoretical Frame of Reference

(2014), stress that public sectors are stipulated by laws and guidelines but not by their customers’ who are the citizens. Further, Wagenheim & Reurink (1991), mentions that the activities in a public sector are providing information, communicating, responding and solving problems, which are intern the characteristics of a customer service.

By considering these differences with respect to public sector and private sectors, the process improvements in public sector has been presented in the next sections of this chapter.

2.3.1 Process Improvement Strategy in Public Sector

The public sectors have been trying to follow the best practices from the various quality management approaches applied in the private sector (Bhatia & John, 2008). The quality management system is a structured collection of procedures, processes, policies working harmoniously as a single system for achieving quality standards, goals and missions of an organization (Bergman & Klefsjö, 2010). Process Improvements can be referred to proactive efforts to improve the quality of services and products to have increased customer satisfaction (Boutros & Purdie, 2014). As mentioned in the introduction chapter, there are several approaches in practice and they follow some systematic procedures based upon their principles and tools.

Although there are many tools in common, the principles vary slightly. Often these improvement approaches are termed as strategies for process improvements. The use of tools can be used as strategies which help in process improvements apart from following the entire systematic approaches (Maleyeff, 2007). Lean and Six Sigma are considered to be similar methodologies and come from the roots of the Total Quality Management (Dahlgaard & Dahlgaard-Park, 2006). Recently the combined usage of Lean Six Sigma, where the best of these two approaches is used for process improvements and implemented in many public sectors (Cole, 2011).

The barriers in implementing process improvements could occur in both public and private sector, but the appearance of barriers has more frequency with respect to government services (Maleyeff, 2007). Some of the barriers which commonly occur in government public sector are inconsistent leadership motivation, union rules and regulations, job security concerns, and a prevalence of undocumented processes (Maleyeff, 2007). Additionally, the government departments in the public sector usually focus on solving their problems by installing various IT systems rather than focusing on the system thinking and problem solving (Bhatia & John, 2008). Further Cole (2011), mentions that the problem of revenue being not directly linked leads to create limited sense of urgency.

The stovepipe environments often lead to the risk of sharing information across the organizations. The information sharing and transparency are common features for successful process improvements (Boutros & Purdie, 2014). Other problems such as lack of common goals, lack of customer focus, complexity of the processes and lack of knowledge on process improvement concepts are to be considered while implementing process improvements (Cole, 2011). These challenges can be overcome by using certain tools as strategies from the Lean and Six Sigma methodologies (Cole, 2011). With a change in the organizational culture by inducing the quality strategy into the people minds, such barriers can be overcome. Further, the
implementation of these methodologies should be at three levels- individual level, team level and organizational level, which should be from both top-down and bottom-up managements (Dahlgaard & Dahlgaard-Park, 2006).

2.3.2 Six Sigma in Public Sector

Six Sigma is a process improvement approach where the focus is on the reduction of variations in a process (Pyzdek, 2003). It was first introduced in the Motorola company as a strategic initiative for reducing the defects and since then it has been widespread in many organizations working in both public and private sectors. The Six Sigma concept is built around the statistical definition which says that in a process over time there should not be more than 3.4 defect parts per million opportunities (DPMO) (Pyzdek, 2003). This means that with the increase of the sigma level, the variation in the process decreases (Pyzdek, 2003).

The Six Sigma approach follows a DMAIC framework with a project-based approach, where quantitative data is used to measure and analyze the process efficiency with the help of statistical tools and hypothesis testing (Brook, 2014; Pyzdek, 2003). On the other hand, the solutions are generated using qualitative tools (Brook, 2014; Pyzdek, 2003). This framework is initiated when a problem is identified. The table 1 below gives an overview of the DMAIC phases:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>D – Define</td>
<td>The problem is understood, and the goal of the improvement activity will be set by understanding the customers’ needs.</td>
</tr>
<tr>
<td>M – Measure</td>
<td>The existing data will be measured with the help of measurement systems. The process capability will be measured by using the quantitative data for statistical analysis such as dot plots, box plots, pareto charts, and control charts.</td>
</tr>
<tr>
<td>A – Analyze</td>
<td>This phase consists of two steps – Data door analysis &amp; Process door analysis. The data is analyzed statistically by hypothesis testing, histograms, normality tests in the data door analysis. In the process door analysis, the process is mapped, and the root cause analysis is performed.</td>
</tr>
<tr>
<td>I – Improve</td>
<td>The solutions are developed, and best solutions are selected in this phase by using various innovative approaches. A risk analysis on the selected solutions is also developed in this phase.</td>
</tr>
<tr>
<td>C – Control</td>
<td>The solutions are implemented in this phase and the control measures are established so that the solutions are sustained in the process.</td>
</tr>
</tbody>
</table>

Table 1: Overview of Six Sigma DMAIC Phases
Source: Brook, 2014

Six Sigma follows the above framework by using various tools which help in delivering the outputs according to each phase. The focus of the entire Six Sigma project process is on the customer, who receives the end products/services. The customer focus is very much needed in the public sector and by following Six Sigma ideology, there can be a clear differentiation on who is the customer of the process. The tools such as voice of the customer (VOC), critical to quality (CTQ) are very much customer oriented and applying these helps in defining steps creating value to the customer in the process. In the public-sector setting, the Six Sigma methodology can be used in the similar way like in manufacturing or service sectors. But, the criticism for using Six Sigma in public sector is that lack of quantitative data for using statistical
analysis. Six Sigma methodology emphasizes the importance of data as the principle says that decisions should be based on facts and facts can be only from data (Antony, 2006). It could be a challenge to implement this methodology in service sectors especially when there is no data available as the prioritization in service industries is based on a subjective interpretation (Antony, 2006). The problem with lack of various data collection techniques in the public sector is a problem of discussion for implementing Six Sigma (Cole, 2011).

2.3.3 Lean in Public Sector

Toyota has contributed to the Lean Production in the manufacturing sector, which has been imbibed in service sectors as well as public service sectors (Cole, 2011). Lean is mostly referred as a management philosophy to improve the efficiency in a process by eliminating the wasteful activities (Liker & Meier, 2006). The elimination of the wasteful activities refers to the steps or activities in a process that does not add any value to the process (Liker & Meier, 2006). The Lean concept consists of five principles developed by Womack & Jones (1996):
- Define customer value
- Map the value stream
- Create the flow
- Establish Pull
- Strive for perfection.

Although these are developed with respect to manufacturing settings, these are being adapted to service environments while implementing lean. According to Åhlström (2004), the Lean principles should be translated according to the service context and implement because of the existence of some contingencies while using Lean in service sectors. For this reason, Bonaccorsi, et al., (2011), came with the implementation of lean in the service environments and defined ten kinds of wastes in a service sector. The wastes are presented in the table below:

<table>
<thead>
<tr>
<th>Wastes</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defects</td>
<td>Errors in data entry, Lost files, Lost or Damages goods.</td>
</tr>
<tr>
<td>Duplication</td>
<td>Repetitive data entry, Multiple signatures, Unnecessary reporting, Multiple queries.</td>
</tr>
<tr>
<td>Incorrect Inventory</td>
<td>Stock out, Wasting time finding what was needed, Unnecessary copies.</td>
</tr>
<tr>
<td>Lack of customer’s focus</td>
<td>Unfriendliness, Rudeness, Poor attention to the customer.</td>
</tr>
<tr>
<td>Overproduction</td>
<td>Reports no one will ever read, Processing paperwork before time.</td>
</tr>
<tr>
<td>Unclear communication</td>
<td>Incorrect information, Lack of standard data format, Unclear work flow.</td>
</tr>
<tr>
<td>Motion/Transportation</td>
<td>Poor layout, Ineffective filing, Poor ergonomic.</td>
</tr>
<tr>
<td>Underutilized Employees</td>
<td>Inadequate tools, Excessive bureaucracy, Limited authority.</td>
</tr>
<tr>
<td>Variation</td>
<td>Lack of procedures, Lack of standard formats, Standard time not defined.</td>
</tr>
<tr>
<td>Waiting/Delay</td>
<td>Waiting for approvals, Downtime, Waiting for supplies.</td>
</tr>
</tbody>
</table>

Table 2: Ten Lean Wastes in Service Sector
Source: Bonaccorsi et., al (2011, p.430)

The concept of zero wastes is often considered to be difficult to implement in service sectors because of the high involvement of people and it is obvious to expect human errors (Åhlström, 2004). On the contrary, the causes for these wastes in the public sector is also due to people in the form of hierarchical and functional departments which require many levels of approvals. The application of lean tools can reduce the problems with the wastes and increase flow in the
public sector (Cole, 2011). The organizations should choose the tools carefully according to their identified problems. There are simple tools such as Value Stream Mapping, Process Mapping, Kaizen, White board meetings, and 5S can be used in public service sectors (Cole, 2011). However, applying only lean tools cannot increase efficiency and is criticized to be unsuccessful when applied in any sector without first imbibing the roots of the lean philosophy (Liker & Meier, 2006). Further, Radnor (2010), from a case study on lean tools and techniques application in government, resulted that the use of tools lead to some improvements and inducing tools can be used as a starting point to engage the organizations towards lean thinking.

2.4 Presentation of the selected tools

Lean and Six Sigma methodologies consists of many tools which can be used individually for process improvements. Together, they provide a holistic approach for process improvements and their tools are commonly used with respect to the area of field (Maleyeff, 2007). The following tools have been chosen for this study based on the literature study on the public sector discussed in the previous sections. Further, the data availability has also played an important role for the tools selection and has been discussed in detail in the Chapter 3. The combination of data availability and literature study led to the selection of the following tools:

1. Process Mapping
2. Kano Analysis for Voice of the Customer (VOC)
3. Critical to Quality (CTQ)
4. Cause & Effect analysis
5. 5 Why’s
6. Benchmarking
7. Standardization

Process Mapping

The process mapping is a tool used in various quality management approaches including Lean and Six Sigma. This helps the organization to visualize the process as a whole system from a customer perspective (Pyzdek, 2003). Further, this tool is considered to be useful in public sectors as a starting point when working with improvements as the processes in the public sector are usually complex. This in turn, help in overcoming the information sharing, lack of customer focus and complexity problems as mapping the process provides an overview about how they are working from the customer perspective (Cole, 2011). In other words, the process maps help in specifying the value desired by the customer (Radnor, 2010). The commonly known process maps are process flow charts, swim lane charts, value stream mapping, supplier-input-process-output-customer (SIPOC) process maps (Brook, 2014). The purpose of these process maps is to have an idea about the operations in the organization which will in turn help in making decisions about the improvements (Pyzdek, 2003). According to Brook (2014), process maps are the fundamental tools for process improvements and they help in identifying the value stream within a process, document standardized work and focus on eliminating non-value-added activities. Further, Melan (1995, p.15), explained that there are three ways of developing process maps –
I. Interviewing process participants
2. Observation by a process analyst
3. Translating written descriptions into a flowchart

By following the above steps, gives most reliable information for mapping the process can be obtained (Melan, 1995). Among the various kinds of process maps mentioned, the swim lane process map which is also known as as-is process map or problem map, often helps in identifying the problems existing in the process like defects, mis-understandings within the process (Brook, 2014). This kind of cross-functional process maps are usually drawn between various departments/divisions within an organization to understand the flow from the customer perspective (Brook, 2014). They also define the roles and responsibilities in each stage of the process activity by showing which activity is performed by whom and corresponding to which department (Boutros & Purdie, 2014). This helps in setting clear instructions and guidelines for the people working within the process. The below figure 2, illustrates an example of a swim lane process map.

<table>
<thead>
<tr>
<th>Process Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation Phase</strong></td>
</tr>
<tr>
<td>Start</td>
</tr>
<tr>
<td>Process 2</td>
</tr>
<tr>
<td>Process 1</td>
</tr>
<tr>
<td>Department 1</td>
</tr>
<tr>
<td>Department 4</td>
</tr>
</tbody>
</table>

*Figure 2: Example Swim Lane Process Map
Source: Grapholite, 2010*

VOC by Kano Analysis

The voice of the customer (VOC) is a process used in Six Sigma to collect the customers opinions about the process. This ensures that the process is customer focused and acts as a starting point for process improvements. According to Brook (2014), there are many ways to gather the voice of the customer like customer complaints; direct contact methods – interviews, phone calls, focus groups; less direct methods – surveys, feedback analysis, market research and mystery shopping method. In whatever way, one should not miss an opportunity to gain the insights about the customer experience. After collecting the customer insights, the next step is to arrange them in a systematic manner.
In public sector, the challenges of low customer focus and lack of urgency can be overcome by using the VOC process (Cole, 2011). This helps the organizations like municipalities to understand what their citizens are expecting along with who are their customers. Further creates a better communication platform between the citizens and the employees of the municipalities. Kano analysis is one of the frameworks, which serves for categorizing and prioritizing the features of a product or service according to the customer requirements given by Dr. Noriaki Kano (Bergman & Klefsjö, 2010). After listening to the customers by using the mentioned ways, their experiences and requirements can be arranged according to the Kano model. This model mainly categorizes the customer requirements into three categories (Brook, 2014):

**Must-be:** The must-be characteristics depicts that the customer assumes that these are present in the product or service by default and missing this characteristic makes them dissatisfied (Brook, 2014).

**More is better:** The more is better characteristics are not necessary to be present in the product or service but having them makes the customer more satisfied (Brook, 2014).

**Delighters:** The delighters are the unexpected and excitement characteristics in the product or services which boosts the competitive advantage. The customers don’t even know that such characteristics exit in the service or product (Brook, 2014).

**Critical to Quality (CTQ)**

The critical to quality (CTQ) is a tool used in Six Sigma, which is a tree like hierarchical structures, used to interpret the voice of the customer quantitatively and help in providing clear strategy for the improvement of a service or product (Brook, 2014). Regardless of the source of information about the VOC, specific attributes can be captured when arranged the customer specifications systematically (Boutros & Purdie, 2014). The CTQ’s begin with the need followed by drivers of the need. Then aligning them by setting up CTQ requirements. The measured CTQ and the target value will also be set. The below figure 3, shows an example CTQ tree.

![Figure 3: Example CTQ tree](Source: Mindtools, 2016)
The CTQ’s capture the characteristics defined by both internal and external customers. The CTQ’s are not always same, they change according to the market dynamics, especially in-service sectors where the customer expectations vary hugely (Antony, 2006). Also, the CTQ’s should be critically analyzed and updated from time to time.

**Cause & Effect Analysis**

The cause and effect analysis are also known as fishbone diagrams, which is an effective tool for brainstorming (Brook, 2014). This is commonly used in the analyze phase of the Six Sigma project and also used individually in quality management theories. This facilitates in generating the actual root causes for an identified problem. The cause and effect diagram provide valuable basis for problem solving. When a problem is identified in a process, the root causes should be identified, and brainstorming the root causes using the 7M’s – Management, Man, Method, Measurement, Machine, Material, and Milieu (Environment) helps in identifying the actual reason for the identified problem (Bergman & Klefsjö, 2010). The 7M’s act as a basis and one can consider any other potential areas according to the problems. The 7M’s need not be used always as the same, instead they can be termed according to the scenario of the process on which it is performed (Brook, 2014). The cause and effect diagram has been presented in the figure 4.

![Figure 4: Example Cause and Effect diagram](source: Bergman & Klefsjö, 2010)

Once the root cause analysis has been performed, the identified causation of the problem should be verified with historic data or new data (Brook, 2014).
5 Why’s

The 5 Why’s is similar to the cause and effect analysis, where the reasons for the problems are asked 5 times to get to the actual problem (Brook, 2014). This tool is used both in Lean and Six Sigma approaches. The 5 Why’s can be used individually or together with the cause and effect analysis. Asking why a particular problem raised, avoids blaming and leads to the actual reason for the problem, see figure 5 (Liker & Meier, 2006). The thorough and complete analysis will provide the root causes that clearly indicate specific actions that are to be avoided (Liker & Meier, 2006).

![Problem Statement Diagram](image)

**Figure 5: Example of 5 Why's**  
*Source: Liker & Meier, 2006*

Benchmarking

Benchmarking is an improvement tool commonly used in Six Sigma project for identifying the improvement opportunities from other processes (Brook, 2014). This tool is also being used generally for collecting the best practices from other processes (Melan, 1995). It is considered to be a very useful in municipalities as this provides an insight to know how other municipalities are working (Cole, 2011). Further, Melan (1995), says that benchmarking is a step-by-step structured approach to know the best-performing process which helps in determining the improvements. This leads to increase customer focus, have common goals and creates a sense of urgency by observing the best from the others working with similar processes (Cole, 2011). The benchmarking can be done in four different ways (Bergman & Klefsjö, 2010):

1. **Internal Benchmarking**: Comparing within the organization
2. **Competitor Benchmarking**: Comparing with competitors
3. **Functional Benchmarking**: Comparing with processes operating in the similar fields or performing similar activities
4. **Generic Benchmarking**: Comparing with best from all industry group.

Further, the process of benchmarking is described to be performed in six steps – plan, search, observe, analyze, adapt, and improve which are similar to the PDSA – Plan-Do-Study-Act cycle of the Deming’s improvement cycle (Bergman & Klefsjö, 2010). As described by Bergman & Klefsjö (2010), the brief explanation of each of the steps in benchmarking are as followed:
➢ *Plan* – In this step, the process that is to be improved should be analyzed and understood.

➢ *Search* – In this step, the organization should be decided for benchmarking by performing research about the various organizations.

➢ *Observe* – In this step, the organization chosen for benchmarking should be studied and measure the performance gaps between the process that is to be improved and the benchmarked one.

➢ *Analyze* – In this step, the root causes for the performance gaps in the process that is to be improved.

➢ *Adapt* – In this step, the best practices from the benchmarked organization should be selected and modify them with respect to the organization at which the process is to be improved.

➢ *Improve* – In this step, the improvements selected should be implemented and integrate them with the business process improvements.

A caution for benchmarking is that, one should not copy rather should consider the best practices and try to evaluate them in their organization’s process (Bergman & Klefsjö, 2010). The important factor for benchmarking is to find the organizations who are willing to provide information about their practices and create an open communication channel (Cole, 2011).

### Standardization

The standardization is a commonly used tool in Lean methodology either as a part of 5S tool – Sort, Set in order, Shine, Standardize, and Sustain or individually as a waste elimination tool in a process (Liker & Meier, 2006). This tool is often misunderstood between standardized work and work standards (Liker & Meier, 2006). According to the Toyota way mentioned by Liker & Meier (2006), standardized work is a strategic and effective way where the process should be observed and identify the steps that are to be standardized. On the other hand, there will be some work standards which every organization usually sets up and it is not what the standardization in Lean methodology redirects to (Liker & Meier, 2006).

The standardization or standardized work, when used as an individual tool for elimination of wasteful activities, it helps in reaching a consistent operation in a service process (Maleyeff, 2007). A non-standardized work can create significant amount of wastes, in terms of re-work, and duplication (Cole, 2011). According to Radnor (2010), standard works in not really a good step in the public sector because of the mandate to law and external pressures of politicians. But, he says rather when the processes are standardized instead of the routines, it provides time for creativity and innovation for the employees and the processes run smoothly (Radnor, 2010). When the process maps are made, the mandatory steps can be identified, problems by using the root-cause analysis can be explored and finally these can be used for analyzing which steps need to be standardized in the process (Liker & Meier, 2006). However, there are no procedures or method clearly saying how to standardize a process.
3 Methodology

This chapter describes about the research methodology and choice of the research approach. The data collection techniques for the study will be available along with an analysis of how the data was used in the study. Further, the reliability, validity and ethical considerations of the study are also available in this section.

3.1 Research Approach

According to Huff (2009), the methodology provides credibility and trustworthiness to the research study. The main purpose of a research method comes with the following four criteria – firstly they are not primarily used to validate technical criteria, rather help in understanding the approach methods, second is they help in verifying the credibility of the study, third and fourth are to identify the objectives and be able to reach the target audiences with the results (Huff, 2009).

There are various kinds of research methods, one of them is action research method where a solution is developed for a real problem observed in an organization, institution or a program (Merriam, 2009). In this kind of approach, the researcher systematically studies the problem and develops a solution with the help of the theoretical frameworks (Merriam, 2009). On the other hand, a case study research begins with the researcher’s interest to contribute to the field of study using various sources of information (Merriam, 2009). Both the approaches direct towards gaining in-depth knowledge of a particular phenomenon in a real context. The research approach for this thesis work is a combination of case study and action research, where a real problem at MoS department of Linköping municipality has been studied which can be related to the context of process improvements in municipal organizations. All-in all, the author addresses this research as a case study approach.

According to Yin (2014), a case study research approach consists of research questions often in the form of ‘how’ and ‘why’ when the focus is on contemporary events, with no requirement of control over behavioral events. Further, such questions are suitable while conducting a qualitative study, in order to have a holistic approach of the problem (Yin, 2014). A case study research with qualitative study is most suitable when the researcher wants to gain in-depth knowledge and analysis along with multiple sources of evidence (Voss, et al., 2002; Yin, 2014). Therefore, the research questions have been chosen to begin with ‘how’, by following the qualitative study approach which is most suitable for this study.

There has been criticism for the case study research methodology because of the risk of generalization of the results and conclusions, according to Voss, et al., (2002). Also, Yin (2014) stresses that during the course of the case study, there is a risk of having a shift in the research which may lead to raise in new research questions. In such cases, it is advised to start the research from the beginning and understand whether the case study approach is suitable or not for the research (Yin, 2014). However, this can be overcome by thorough theoretical review in the beginning of the study, followed by the triangulation of resources (Yin, 2014). These result
in having reliability and validity of the data collected. This will be further discussed in the 4.5 section of this chapter.

### 3.2 Study Approach

After choosing the research approach, the following steps have been considered while performing the thesis study:

1. First, the problem has been identified and scope of the thesis was defined. Then, research questions have been generated to perform the study.

2. Second, the theoretical frame of references related to the quality, customer focus, process, process management and process improvements in public sector have been thoroughly studied. Then tools have been selected from Six Sigma and Lean methodologies for process improvements. Simultaneously, the MoS department’s organization structure, quality plans and service approaches have been studied from the internal documents and observations during the course of the study.

3. The data collection methods have been identified and relevant data has been gathered. Qualitative study has been performed by conducting semi-structured interviews with the head of the six offices and some customers who had a service encounter with the UEO. Further, interviews with the case officers of the UEO have been performed about the customer request handling process which were also semi-structured. Additional data from historic surveys, Flexite tickets, direct observations and literature review have been gathered.

4. All the collected data has been presented as the empirical findings in the report. An analysis on the collected data has been performed, from which suggestions for a process improvement that would be suitable in having a follow up with the customer satisfaction for the UEO has been provided. Further, the process improvement strategy has been developed from the analysis.

5. The discussion on the obtained results with respect to reviewed literature and the studied methodology have been presented. Finally, the study has been concluded by answering the research questions.

The overall thesis process has been stratified into five major steps as discussed above and presented in the below figure 6.

![Figure 6: Thesis Overview](image-url)
After the purpose and research questions have been decided for the study, the relevant literature has been reviewed. Although, the literature review is also considered to be part of the data collection, according to Yin (2014), it is important to have a literature study prior to the beginning of the case study. This will help the researcher as a pre-study to have a knowledge about what theories are relevant in the chosen research area (Yin, 2014). Thus, the literature review has been performed continuous throughout the study. First, some literatures have been reviewed before the beginning of the study that helped in building of the case study’s purpose and research questions; second, other literatures which helped in framing the qualitative data collection as well as analysis of the empirical findings. The literature review has been performed in almost every stage of the study, but extensive review has been performed in the second stage of the study. This will be further discussed in the next sections of this chapter.

3.3 Literature Review

The preliminary literature study, theory development is considered to be essential during the design phase of the case study research (Yin, 2014). According to Eisenhardt (1989), the case study research method should begin with theory selection which are related to the dynamics of the current scenario of the research area. Typically, in case studies the use of theories and literatures related to the research topic will enhance the research design and the data to be collected (Yin, 2014). Therefore, the literature review has been a continuous process in this study.

The literature review should help in theory building or evaluating existing theory by applying the concepts with the case study (Eisenhardt, 1989). The focus of this study is not on developing new theories, rather focuses on applying the existing theories to the current scenario of the case study. Therefore, the initial literature review began with studying about the process improvements and quality of services in municipal organizations. This led to identify some journals which discussed about the challenges and difficulties in the public sector. Though, there were limited research articles about process improvements in municipal organizations, the author found interesting literature about service delivery, quality of service in public sector. As, municipal organizations are also public sectors, these have been useful literature review. Various key words such as process improvements, process management, quality management, public sector, municipalities, and Lean, Six Sigma, Lean Six Sigma have been used to search the literature.

The selection of the literature should be careful, as there is plethora of literature accessible through the internet. The researchers should search the literatures that are well-known, accepted and trustworthy (Yin, 2014). Therefore, the number of citations of the selected literature has been reviewed and some literatures were identified by citations in the journals, articles and other theses. The theoretical resources are from various journals, articles and books related to the field of quality management and qualitative research. The author has already discussed in the Chapter 2, about all literature that has been used in this study. The primary source for accessing these literatures is from Linköping university library books and articles, text books, articles and
e-books accessed from Diva Portal, Research Gate, Google Scholar, Science Direct, ASQ and Scopus websites. All the citations have been referred in the last chapter of the report.

From the reviewed literature, the author selected some tools from the inspiration of Lean and Six Sigma methodologies. The choice of the tools is based on the data collection decided for this study. As mentioned, the study is primarily based on qualitative data which is from the semi-structured and in-depth interviews, the tools which are suitable to implement with verbal data has been chosen. An overview of how the selected tools helped in the data analysis has been given in the following sections of the report.

### 3.4 Data Collection

The data collection methods can be classified as qualitative, quantitative and mix of both methodologies (Huff, 2009). The most suitable method of data collection for a case study research is qualitative data as it provides an opportunity to get access to information that could not be gathered through surveys (Voss, et al., 2002; Yin 2014). Yin (2014), mentioned that there are six sources of evidence in data collection for a case study, which are -Documentation, Archival records, Interviews, Direct observations, Participant observations, and Physical artifacts. This makes the data collection in case studies complex because one case is being studied from different perspectives and thus requires multiple sources of evidence (Yin, 2014). Each of the sources of data collection have their strengths and weaknesses, while combining all the sources of the evidence is observed to provide better results instead of single source of evidence (Yin, 2014). More than one source of data collection validates for the triangulation of the research method and therefore, this study considered all the possible sources of information to strengthen the results (Voss, et al., 2002).

The primary data collection is from the qualitative data that has been obtained from various interviews. Along with the interviews, additional data from various other sources have also been used for this study. The data has been collected from previous year’s historic survey, that was conducted by the MoS department in order to evaluate their service quality. The issues registered in the internal ticket handling system – Flexite which have been registered under the UEO have also been used to interpret the current process.

#### 3.4.1 Interviews

Qualitative data collection has been chosen to be suitable for this study and the most common way of obtaining qualitative data is by conducting interviews with the people working in the focus area of the study (Yin, 2014). The interview method in qualitative studies could be categorized into three types - structured, semi-structured and unstructured (Bryman & Bell, 2016). The structured interviews follow a common protocol where the set of questions will be given to the respondent in advance; in semi-structured interviews the questions are given in advance, but the interviewer can ask follow-up questions which might lead to more information gathering (Bryman & Bell, 2016). The unstructured interviews are more like open-minded discussions where the interviewer uses the lists of topics and have a dialogue with the respondent (Bryman & Bell, 2016).
Employee Interviews
The primary source of data collection is from the interviews with the core members of the MoS department, UEO division heads and case officers. A semi-structured interview approach has been followed with everyone during the interviews. Further, all the interviews were face-to-face conducted in a meeting room. The selection of the respondents was based on their roles and knowledge about the customer request process. The questions have been designed by the author along with the supervisor at the organization. While preparing the questions it has been kept in mind that avoiding technical terms, knowledge of the respondents and simultaneously having a focus on the research questions as suggested by Bryman & Bell (2016). The questions have been sent to the chosen respondent in advance to have a preparation and idea about the topic, because the respondents work with various processes and job tasks. Additional questions have been asked based on their answers to have a clearer understanding about the scenario. To have a structured approach, an interview protocol has been set. The questions have been emailed to the respondents in advance, and this gave them a prior information about the purpose. Further, during the interviews, the purpose of the study has been presented to the respondents.

According to Merriam (2009), the most common and useful way to preserve the interview data is recording the interviews. The recorded data will serve for the analysis whenever possible in the research process (Merriam, 2009; Bryman & Bell, 2016). While Yin (2014) argues that recording is not always a best choice and it depends on the personal preference. The alternative suggested way for recording the interviews is drafting or transcripting the data in written form, however a least preferred way is that drafting or writing down as much as remembered after the interview (Merriam, 2009). Therefore, considering these suggestions, the author chose to take notes when some points were considered important during the interview as well as recorded the entire conversations by using voice recorder application. This is to ensure that the author does not miss anything that is useful for the research and also review the interview whenever required. All the respondents’ consent has been taken before recording them as it is an important ethical aspect to consider while recording (Merriam, 2009). Each interview lasted for about 45-90 minutes.

The interviews which were conducted in the early phase of the thesis, were not recorded but key points have been written as notes by the author. These interviews were considered to be more informal conversations with the respondents to get acquainted with the organization’s process. Therefore, those which were not recorded have been contacted again and interviewed, where the second-time interviews were recorded. The interviews have been listed in table 3. The interview guide has been presented in the appendix 1, where interview guide 1 has been used for the offices chiefs/heads and managers interviews, followed by interview guide 2 has been used specific to Case Officers at UEO.
### Table 3: Overview of the Employee Interviews

**Customer Interviews**

In addition to the interviews with the core members and employees of the organization, few customers who have used the service from UEO have been interviewed. According to Bergman & Klefsjö (2010), improving and developing process without the perspectives of the people receiving them is not worthful. Therefore, to see how the process is working from the customer point of view, few customer interviews have also been conducted. The customers were contacted with their contact information from the internal customer support ticketing tool named Flexite system.

The customer interviews were also semi-structured where the questions were kept direct and short. According to Bryman & Bell (2016), the questions should be in a form where the respondent is able to answer them. Similar to the precautions taken in designing the questions for the employee interviews, the questions for the customers did not mention anywhere about the technicality of the interview which was about the customer request handling process. Rather, the focus was to understand what are the customer expectations and how was their experience with the service. The voice of the customer was the main focus for the customer interviews, so was the reason for less questions which focused on the service quality and customer needs. The questions have been designed by the author with guidance from the
supervisor at the organization. to Bryman & Bell (2016), suggested that the questions should avoid being led to yes/no answers. So, the questions had follow up questions which rephrases the main question. For example, when the customers answered yes/no for the questions like – are you satisfied with the service? Follow up questions such as could you explain how satisfied you are with service? have been asked. A detailed interview guide named interview guide 3 has been presented in the appendix 1.

All the interviews have been telephonic interviews, which was another way of qualitative data collection, but not really a common way (Bryman & Bell, 2016). In this study, having a direct face to face interview with external customers was not feasible, as it included cost and difficulties in motivating the customers to meet. So, telephone calls have been decided to be the most convenient way. A total of 30 customers contact details have been gathered and contacted them via MoS customer support telephone number, out of which 19 customers chose to respond and gave their valuable suggestions. The responses have been drafted as well as voice recorded, except for six customers because they chose to answer via email. Therefore, the questions have been sent to them via mail and the responses have been saved. However, these e-mail respondents answered only to the questions given in the mail, which means these customers interviews were structured interviews. Also, four out of six customers responded for the emails.

### 3.4.2 Historic Surveys

Conducting surveys is considered as an unbiased approach to understand the respondents’ opinion, but they tend to have narrow approach (Merriam, 2009). Some of the qualitative studies use behavioral surveys avoiding intimidating situations to the respondents (Merriam, 2009). So, in this study considering various reasons, the survey which the organization has previously conducted were used. This added as additional data to the existing sources of data information. The survey from 2017 and its results have been presented in the appendix 3.

The survey was conducted by a consulting firm on behalf of the Linköping municipality – MoS department in end of the year 2017. They were distributed via post to 1000 randomly selected citizens of the municipality and the age group varies from 16-79 years. Most of the questions from the survey are related to the opinions about how the municipality is maintained and it was in Swedish. A total of 30 questions were given in the survey, where the options were similar to a Likert scale. Five questions out of the 30 questions were related to the people who had contact with the organization regarding any service or request or complaint that related to the studied customer request process.

### 3.4.3 Customer requests

The other source of data collection was from the customer requests registered in the internal IT systems. These can be considered as some sort of archival data that are quantitative data which can be accessed from the case study company/setting (Yin, 2014). These data can be retrieved and reviewed over and over when one has permission to access. In this study, the archival records were available from the internal IT systems named Flexite, W3D3 and Navet. Due to the requirement of special permissions for accessing all the sources, the author was able to
retrieve data from only Flexite system. The customer requests first get registered in the Flexite tool and from there they go to various other systems which the respective divisions of UEO chose to use. The various kinds of issues received were observed from these Flexite tickets and also the customer information has been obtained from this system. As the later stages of the Flexite tickets could not retrieved, this influenced the choice of tools to be fit for qualitative study. Therefore, the statistical analysis tools have not been selected.

3.4.4 Documents

Along with the literature review, other documents of the case should be reviewed in order to understand the scenario at the case setting (Yin, 2014). Therefore, the study considered the internal documents of the MoS department that were available from the intranet archive. The activity plans of every office, guidelines, goals and standards of the processes have been accessed. The customer requests handling process with respect to UEO has not been documented but the overall process has been mapped in the intranet. The information from the internal documents have been used for discussions during the interviews and brainstorming session with the supervisor at the case organization. All these files have been accessed by the author with authorized permission from the organization.

3.4.5 Observations

The unique strength on the case study research approach is its ability to deal with wide range of data collection (Merriam, 2009). As they take place in a real-world, Yin (2014), suggests that direct observations by the researcher is a great opportunity to get more details about the topic of the study. The observations are complementary to the data collected from the interviews, where the observations vary like direct observations, less formal meetings, and behavioral observations (Yin, 2014). Therefore, in this study the author utilized various opportunities that helped in observing the process closely. The observations included some informal conversations with various employees who were involved in the process. This helped in getting a wider perspective of the working culture as well as the customer request process.

In addition to the above, the author has attended some of the meetings that happened with respect to the studied process. Though the agenda of those meetings was different, it provided some additional information about the motives of the employees towards the customers and potential ideas of future services.

3.5 Analysis of Data

The analysis of the data plays a crucial part in qualitative studies, because the data is not numbers but words which has to be interlinked with the theories and then analyzed (Merriam, 2009). In a qualitative study, the data analysis is said to be emergent and should be analyzed simultaneously with the data collection (Merriam, 2009). Therefore, in this study the data is being continuously analyzed after every interview by the author. The results have been discussed with the organization’s supervisor and UEO office head. The feedback from them reduced the ambiguity in the analysis of the research.
Although, there was availability of the quantitative data, from the internal ticketing system, they have not been of much help to use any statistical tools because of the use of different systems in various levels of the process. The difficulties with this data has been identified as one of the problem with the process and will be discussed in depth in the Chapter 4.

The literature has been reviewed before collecting the data, which provided inputs for what data will be required for the study. The selection of tools for the kind of data available was also from the literature study. The literature helped in evaluating the sort of tools suitable for the qualitative data analysis. The data from interviews, historic surveys, documents and observations was analyzed using tools in the following way presented in the below table 4:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Purpose</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Mapping</td>
<td>Process mapping from interviews and used to identify the problems</td>
<td>As-Is/Swim Lane process map, where the process has been visualized on basis of the data collected from all the interviews (customer &amp; employee).</td>
</tr>
<tr>
<td>VOC by Kano Analysis</td>
<td>Organize the customer requirements</td>
<td>The feedback from the customer interviews (external customers) and employee interviews (internal customers) and service rating, feedback in historic surveys has been arranged according to the Kano analysis structure – must be, more is better, delighters.</td>
</tr>
<tr>
<td>Critical to Quality</td>
<td>Analyze the customer requirements</td>
<td>The voice of the customer from customer interviews and historic surveys, the aspects that were related to service quality has been set quantitatively.</td>
</tr>
<tr>
<td>Cause &amp; Effect Analysis</td>
<td>Root Cause Analysis of the problems</td>
<td>The root causes for some of the identified problems were brainstormed by using the ishikawa cause and effect analysis which was from interview data analysis and observations.</td>
</tr>
<tr>
<td>5 Why’s</td>
<td>Root Cause Analysis of the problems</td>
<td>The root causes for some of the problems were identified by asking the questions assuming the probable causation 5 times (was simultaneously used in some of the interviews).</td>
</tr>
<tr>
<td>Benchmarking</td>
<td>Improvement Suggestions</td>
<td>The benchmarking has been done with one of the internal office with similar process in order to identify the best practices.</td>
</tr>
<tr>
<td>Standardization</td>
<td>Improvement Suggestions</td>
<td>The strategy for standardized work has been presented to set the working standards and routines.</td>
</tr>
</tbody>
</table>

Table 4: Summary of the selected tools for data analysis

The problems have been identified mostly from the process mapping tool with the analysis of interviews data. The VOC and CTQ tools were used to organize and analyze the customer requirements and set up target specifications with the help of interviews data. The historic survey results have been analyzed as a complementary to calculate the CTQ estimated measurements as well as to strengthen the VOC analysis.
In addition to the above, the observations and internal documents served as complementary while identifying the root causes. The cause and effect analysis and 5 why’s tools were used to analyze the problem root causes and later verified whether the root causes are true or not. The benchmarking tool and standardized work were used for developing improvement suggestions. Most of the improvement suggestions were identified directly while benchmarking tool was used. The following steps from Bergman & Klefsjö (2010) were followed for finding improvements from benchmarking:

- **Plan** - the existing process at UEO has been studied and analyzed thoroughly, where a root cause analysis on the identified problems has been performed by using the tools.
- **Search** – a suitable organization has been researched. First, the other municipalities in Sweden have been looked upon to perform benchmarking. But, due to non-availability of resources to perform this from other municipalities, internal offices within MoS have been researched and the best performing office has been chosen by the Process Leader for this purpose.
- **Study** - The customer request handling process of the Public Health and Environment office has been studied and the in-depth interview with the division head provided valuable insights on how their process is working.
- **Analyze** – Further, analysis on this office has been used to compare against the UEO process analysis and the gaps have been identified.
- **Customize** – The best practices have been selected and customized appropriately for the UEO improvements.
- **Improve** – As the implementation is not in the scope of the thesis, the improvement suggestions are identified and presented.

Analysis of the data has been done simultaneously with data collection because most of the data is verbal and required continuous evaluation. As mentioned in the data collection section, the collected information was recorded and simultaneously transcribed. This helped in going back and reviewing the information during the analysis and discussion. The data was continuously integrated and evaluated with the literatures reviewed. The practical observations, informal conversations and brainstorming sessions helped in the later process of analyzing the data. The analysis of the data ended, when the answers for the research questions were identified.

### 3.6 Trustworthiness of Research

The key indicators for quality of a research are the reliability and validity of the data collected (Bryman & Bell, 2016). Regardless of the type of research, validity and reliability should be addressed by conceptualization of how the data was collected, analyzed, interpreted, and the way in which the findings are presented (Merriam, 2009). Along with the quality of study, the ethical considerations followed in the research are also very important, in order to ensure that the researcher has not produced any results that are against the participants in the study (Yin, 2014).
3.6.1 Reliability

The reliability of a research means that the results from the study should remain the same if re-tested (Bryman & Bell, 2016). The reliability of the data however may tend to change in a qualitative study because the environment, setting and time may affect the results (Yin, 2014). Therefore, Yin (2014), recommend that the researchers should carefully document every step of the research. Also, Merriam (2009), stress that due to the nature of qualitative research, the researchers should record the data and continuously analyze the findings. Therefore, in this study to have data reliability, the author has recorded the interviews with the permission from the respondents and wrote important notes simultaneously during the interviews. Further, the results are being discussed with the supervisor at the case company as well as the supervisor at the university following brainstorming sessions to ensure reliability.

3.6.2 Validity

According to Yin (2014), the validity is of three dimensions – construct validity, internal validity and external validity. How these three validations were reached is discussed below:

Construct Validity

According to Bryman & Bell (2016), construct validity tactic is to validate whether the study measured what is intended to measure. To achieve construct validity, three tactics are available, one is multiple sources of evidence, second is to establish chain of evidence and third is to draft the study report which should be reviewed by key informants (Yin, 2014). For achieving this construct validity for this thesis work, the author has used various sources of information such as theoretical frameworks, observations, interviews, quantitative data which leads to the triangulation of the research method. In addition to this, feedback seminars have been arranged, where the drafted copy of the thesis is being reviewed by key informants at the university along with organizations participants to strengthen the construct validity.

Internal Validity

The internal validity depicts how well the researcher has succeeded in proving the events in the study and is crucial during the data analysis phase (Yin, 2014). The internal validity can be achieved by following any of the following four analytical techniques: pattern matching, explanation building, rival explanations, and logic models (Yin, 2014). The pattern matching has been used in the data analysis, where the existing theories are being analyzed whether the hypotheses in the thesis was connected or not.

External Validity

The external validity is used to validate whether the findings of the study are valid in other contexts and can the results be generalized (Yin, 2014). For single case study, the major problem is with the generalizability of the results and it can be overcome by matching it to relevant theories (Yin, 2014). Further, Voss, et al., 2002 argue that a single case study research approach leads to a strong in-depth analysis of the research topic which might lead to generalizing of the results and analysis. Most of the data was collected from the Linköping Municipality archive
and the interviews have been conducted with the employees within the same organization, and limited number of customers which were the limitations with generalization of the results. So, in this study, the author used theories about public sector and municipalities to match the case study results with the existing theories. Further, the triangulation in data collection such as various sources of data, appropriate literature reviews and combined use of Lean and Six Sigma tools for the study helped in strengthening the external validity.

### 3.6.3 Ethical Considerations

In any kind of research study, the researchers should anticipate and avoid the ethical issues in advance (Bryman & Bell, 2016). In qualitative study, the protection of the participants is a concern for ethical issues (Merriam, 2009). The process of reading, saving and copying huge volumes of verbal data which was given by individuals in a qualitative case study makes it crucial for the researcher to protect the identity of the participants (Merriam, 2009). Further, with the wide access to internet, it is often easy to find the individuals and therefore, giving aliases is recommended to protect the identity of the participants. Bryman & Bell (2016, p. 125), mentioned four ethical principles that are to be considered while performing qualitative case studies:

1. whether there is harm to participants,
2. whether there is lack of informed consent,
3. whether there is an invasion of privacy and
4. whether deception is involved.

So, considering these principles, the respondents of the interviews were treated confidentially and their names are not written in the report. Instead, aliases have been used to address the respondents. The customer interview respondents have also been treated with confidentiality and none of their names have been used in the report. Further, the respondents consent has been taken before recording the interview as well as ensured that the participants understood the purpose of the interview.
4 Empirical Findings

This chapter deals with the results from the interviews and data collection. The chapter has been divided into four main sections – a brief description about the MoS of Linköping Municipality; Mapping of the current customer request handling process with the swim lane process map, the VOC collected from customer interviews, and the CTQ tree will be presented in this chapter. The results are from all the data collection sources – customer interviews, employee interviews, historical surveys, customer requests registered in the internal system - Flexite, observations and internal documents.

4.1 Case Description

This section consists of brief description about the Linköping Municipality, about the organization structure of the Miljö och samhällsbyggnadsförvaltningen (MoS). Further, the focused office - Urban Environment Office will be discussed in detail.

4.1.1 Linköping Municipality

In Sweden, there are 290 municipalities and 20 county councils (SKL, 2018). The municipalities are the service providers responsible for care, social services, education and infrastructure (SKL, 2018). The municipal councils are the public administrations who provide services to their citizens. These municipalities always strive to improve their standards and quality of service provided to its customers. Linköping is located in the south of Sweden with 153,000 inhabitants, which is the fifth largest municipality in the country (Linköping, 2016). This municipality consists of certain committees who are responsible for conducting activities in accordance with regulations from the municipal council. The committees shall carry out assignments from the municipal council following their goals, guidelines, budget and decisions in general (Kommunstyrelsen, 2015). The organization structure of Linköping municipality is quite complex with a number of departments, independent offices and their sub-groups.

4.1.2 About MoS Organization

Miljö och samhällsbyggnadsförvaltningen (MoS) is a department for Environment and Urban Planning, who work to create a living and safe community for the citizens of Linköping (Linköping, 2017). It is governed by two committees of the municipal council, namely - Samhällsbyggnadsnämnden (Social Housing Committee) and Bygg - och Miljönämnden (Building and Environment Committee) (Linköping, 2017), where these two committees decide on the development projects in the MoS. The department is further divided into six functional offices, who work on various housing and infrastructural development plans and projects that come from the politicians (Linköping, 2017). Additionally, the offices work with different housing related issues and requests that come from the citizens and business developers of the city (Linköping, 2017). These offices are further divided into small divisions and groups. The following is the brief description of the six offices where each office responsibility has been presented.

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1. **Bygglokovkontoret – Building Permit Office**
   This office is responsible for providing building permissions for the construction of buildings as well as they also perform inspections and consultancy services for any new constructions in the Linköping municipality (MoS, 2017). This office is divided into two divisions where one deals with building permits and other with building inspections.

2. **Miljökontoret – Public Health and Environmental Office**
   This office is responsible for the supervision of the health, food and environmental protection in the commercial buildings such as private companies and organizations in the Linköping Municipality (MoS, 2017). This office is divided into two divisions where one deals with building permits and other with building inspections.

3. **Kommunlantmäteriet – Municipal Surveying Office**
   This office is responsible for conducting surveys for the new constructions with respect to land regulations in the Linköping Municipality (MoS, 2017). This office is divided into two divisions where one deals with land information and other with land surveys.

4. **Plankontoret – Planning Office**
   The Planning office is responsible for developing and providing an overview plan of the city as well as detailed plans of each location based on the customer requirement for the Linköping municipality land use (MoS, 2017). This office is divided into four divisions which work with different modules to serve different purposes of the municipality land.

5. **Stadsmiljökontoret – Urban Environment Office**
   The Urban Environment office (UEO) maintains and develops the public places for the citizens of the Linköping municipality and ensures that they are safe and accessible for the people (MoS, 2017). This office is divided into two divisions and one group according to the work distribution. This has been discussed in detail in 4.1.3 section.

6. **Kontoret för verksamhetsstöd – Administrative Support Functions Office**
   This office acts as a point of contact between the above described five office and the external customers. The internal customers are the people working in the above five offices and the external customers are the citizens and the business owners of the Linköping Municipality. They provide the administrational work and the customer service support (MoS, 2017).

The organization structure with the division of the six offices and their sub-groups has been presented in the figure 7.
4.1.3 About UEO

As briefed in the previous section, the UEO strives to provide safe and attractive living areas for the citizens of the Linköping Municipality. They ensure that the municipality develops and grows simultaneously preserving the nature areas (Linköping, 2017). Further the local traffic regulations, parking guidelines are also under the monitoring of UEO (Linköping, 2017). In this process, the office has lot of communication with the citizens and the business owners of the municipality. They receive customer requests which require quick response and action because usually they hinder the citizens daily routine if not solved. The UEO responsibilities have been defined into four major segments, they are (MoS, 2017):

1. Attractiveness - Create an attractive municipality by new constructions, recreation areas and parks, and actively running city.
2. Function - Functioning of the public landmark, land plots/excavations, re-programming possibilities for city life, and special public transport.
3. Safety – Focusing on road safety, care / clearance, and sanding of the roads to avoid slipperiness.
4. Accessibility – Snow clearance, and design of public landmark.

This office is further divided into two divisions and one small group – first is Urban Environment and second is Operation & Maintenance, the group is called Special Public Transportation (which is under Operation & Maintenance division, see figure 7) (Linköping, 2017). Below is a brief explanation about the kind of issues handled by each division and the group of UEO:
Urban Environment Division
The Urban Environment division consists of 27 employees who are case officers, engineers and project leaders with the division head (Linköping, 2017). This division mostly deals with big projects such as building new streets, roads, bridges, tunnels, cycle tracks, pedestrian areas and parks; further, the municipality traffic security and traffic infrastructure are also under this division (Linköping, 2017). The division tasks are again grouped into traffic, infra and nature issues which have again sub-categories. The customer requests are related to the impact from the big projects as well as some individual issues with respect to the mentioned activities from different individuals.

Operation & Maintenance Division
The Operation & Maintenance division consists of 19 employees who are engineers and case officers with the division head (Linköping, 2017). This division deals with providing safe and secure municipality by maintaining and fixing the day to day problems such as snow clearance, grass cutting, broken glass at bus stops, pot hole closing, city lightning issues, road maintenance, cycle track maintenance, recycling stations accessibility and maintenance etc., within the municipality. The customer requests or complaints are related to the mentioned maintenance issues. Some parts of the maintenance issues are managed by the Entrepreneurs who are the third-party contractors hired by the municipality for maintenance services.

Special Public Transportation Group
The Public Transport group though functions as a separate division, it is placed under the management of Operation & Maintenance division and thus called as a group. It consists of seven employees who work as case officers with the group head (Linköping, 2017). This group focuses on providing help with the public transportation to the people with special needs like disabled and injured people. The customer requests are for the accessibility of public transportation for the special needs people and the employees in this group work dedicatedly in reviewing these applications.

4.2 Customer Request Handling Process
The customer request handling process is a ground support process in the MoS department, which is common for all the offices. But, it varies in each office with respect to categories, requests handling time (known as lead time) and IT systems in which the requests are registered to keep track of the requests. The process begins with a request/complaint/query/suggestion from the customers of the Linköping Municipality-MoS department. According to the defined process, a customer contacts MoS for their needs via various communication systems such as telephone, email, website (www.linkoping.se), post, social media – Facebook, Twitter and direct visit to the MoS office. These requests are later termed as issues or tickets which are to be handled for providing solutions. The customer can be the citizens, business owners, internal customers from various departments or politicians of the municipality. These requests are
handled by three levels of support systems and the routines of handling varies in every office. The defined customer request handling process has been presented in the *appendix 2*.

**First level support**

The first level support consists of two different teams, who work as the first point of contact for the customers.

- It is the Customer Support Team who are the first point of contact for customer requests which *require quick response and immediate solutions*. This support team registers all the customer requests in an IT system called Flexite. They monitor the requests that come from the various sources.

- The other first level support is the Administrator Team, who are also the first point of contact for customer requests that originate from planning, committees, budget and citizen ideas *which require big changes or initiation of major projects such as new constructions and political decisions* within the municipality. The administrators register the requests in W3D3 - IT system. They receive the requests via Customer Support Team, telephone, email, fax and post that are different from Customer Support Team contact information.

These two teams which are the first level of support respond to the customer requests initially by registering them in their IT systems and sort them according to the category of the respective offices and their sub-groups or sub-categories. Then, they redirect them to the respective offices for further handling of the requests.

**Second level support**

The second level support is from the Case Officers, who receive the requests from the first level support system and analyze them to provide correct solutions to satisfy the customers simultaneously fulfilling the law and regulations. Then concerned office’s Case Officer will accept the ticket and process it. Based on the customer requirements and the category of the request, the handling time varies from office to office; division to division and sometimes from issue to issue for the Case Officers to respond and provide solution to the received issues. The requests that come through Flexite system, will be logged into the office’s own ticketing system for further processing. But some divisions continue to handle the issues in Flexite system itself. Sometimes requests that come from Administrator Team require political or legal decisions by either the committee for Buildings and the Environment or Urban Planning. Such cases will be analyzed and sent to committees by the respective Case Officers along with solid documentation.

**Third level support**

It is from the Head of the divisions and group, who seldom involve in the customer request handling process. They act as supervisors of the work flow and mostly work in processing the big project requests. When the Case Officers are unsure about the solution, or when the customers re-appeal when they are not satisfied with the decision, the division head. The Head of the office is also placed in the third level of support who passively involves in the process.
Generally, all the issues should be addressed by sending an initial response to the customer within two working days of the arrival irrespective of the office by the Case Officer assigned for the issue. The response should be given to the customer based on the customer’s choice of contact system provided while sending their request.

4.2.1 Swim Lane Process Mapping - UEO

The current working process had variations from the defined process with respect to the UEO. This has been identified during the semi-structured interviews with the customers and the employees. Therefore, the process mapping tool has been used to picturize this collected information. A Swim Lane Process Mapping technique which is also known as As-Is process map has been used in this case to identify the problems within process and visualize the actual flow in detail. Further, the practical observations, and the informal conversations during the thesis period helped in better understanding of the process which in turn have been used as inputs for mapping the As-Is process map (see figure 8).

The requests related to UEO vary widely starting from major construction issues till small maintenance issues. Further, variations can be viewed from one customer requirement to other customer. For example, a customer might prefer to have flower pots to be placed in an area for speed control, while another customer would not prefer so. These kinds of variations are very high and therefore, handling all the requests by fulfilling the laws and regulations has been viewed as a challenge in the UEO case. This process is carried step by step within the three support levels mentioned in the previous section. In order to understand the process map, it is important that the systems and people involved in this process, their roles and responsibilities need to be comprehended. Therefore, in this section the key systems and main people involved in this process have been presented along with the detailed process description. The main people involved in this process are:

- Customers
- Customer Support
- Administrator
- Case Officer
- Head of Division
- Entrepreneurs

As the case study delimits from considering the Entrepreneurs, they have not been included in the As-Is process map. As mentioned in the previous section, the customer request handling process begins with a request/complaint/query/suggestion from the customers. Later, after registering them into the data base, they are termed as issues. So, in the process map the initial term for customer requests is “requests” and after registering in the UEO database systems, termed as “issues”. A detailed As-Is process map has been presented in the figure 8, followed by the description of the roles and responsibilities of the people involved in the process and the steps involved have been presented. The irregularities in the process have been identified with the help of the As-Is process map and they have been mentioned briefly. A detailed presentation of the identified problems from this process map have been presented in the next section of this chapter.
Figure 8: As-Is Process Map of Customer Request Handling Process-UEO
Customer
The process initiates with a customer request, complaint, query or suggestion. As mentioned in the limitations, the customers of the process refer to only citizens and business owners of the municipality for this study. There are various modes of communication for the customers to contact for their requests/queries such as telephone, email, website, application via post, social media and direct visit for the issues related to UEO. But here at UEO, the customers approach is not always via the first level support. They sometimes take the liberty to contact the Case Officers directly via telephone or email if they previously had a contact with them or sometimes getting the contact information from the website. So, in the As-Is process map (see figure 8), the customer request is even received by the Case Officers directly. Another way of communication is by calling the municipality common customer support, where they redirect again to the MoS department. So, whichever way it is, one can say that the initiation of the process starts from this role. The customers can choose their convenient mode of contact while sending their request for update or follow up. However, there is an option that they can remain anonymous, if they do not wish to receive any update or follow up.

Customer Support
The Customer Support in the process map who are the first level support for the UEO requests also. The process stages begin from this role, where the Customer Support team first monitor all the modes of communication. It was mentioned during the interviews that an average of 130 calls per day can be expected approximately for all the offices. But, it was difficult to separate the UEO issues specifically. This team is completely dedicated to fulfilling the below responsibilities and they are:

• **Registration**
The Customer Support team registers the requests irrespective of the mode of arrival, in their IT system called Flexite. The Flexite is used as the customer support ticketing system to register the customer requests which require fast and easy solutions. To keep the track of the customer requests, Flexite which is a ticketing tool is being used by the entire customer support team of the Linköping Municipality. Sometimes, they receive requests which are to be registered by Administrator and such requests are forwarded to the Administrator team immediately on arrival at the Customer Support.

• **Categorization**
After registering the request in the Flexite system, the Customer Support representative, categorizes it according to the request type. The categorization is done in order to redirect it to the concerned division. If categorization is not done correctly, there is chance that this issue is redirected to wrong division or group.

• **Redirection or Solution**
The next step is to redirect the categorized issues. The Customer Support checks whether the issue is within their scope for solving or not. For the issues related to Operation & Maintenance division, it is common that for some basic issues such as grass cutting, the Customer Support sends it to the Entrepreneurs for external support directly. Once solved, they receive a response
from them via email and send the confirmation to the Customers. Also, some general queries regarding traffic, special transport application and basic requests will be handled in the first level support – Customer Support Team. Otherwise, they redirect it to the correspondent division or group for further handling of the requests.

**Administrator**

The Administrator in the process map, who are also the first level support for UEO requests as well. The difference for this role is that, they receive the customer requests which come under major changes or new project requests and are received from a separate contact mode communication and from Customer Support. For the UEO, the administrator managed customer requests are only for the Urban Environment and Operation & Maintenance divisions. The administrator monitors all the incoming and the outgoing actions present in the W3D3 and spend typically 1-6 hours in a day on this. The responsibilities are:

- **Registration**
  The Administrator team registers the requests irrespective of the mode of arrival, in their IT system called W3D3. The W3D3 is also a commonly used system in all the departments of the Linköping Municipality. The registration can be assigning of a new case or registering an existing case. After registration, the Administrator ensures that an initial response is sent to the customer immediately or as soon as possible on the request.

- **Assignment**
  After registering the request in the W3D3 system, the Administrator, categorizes according to the handbook for W3D3 issues. Here the assignment of the issue to a Case Officer is also a responsibility of the Administrator. The categorization and redirection are usually very clear and structured, and therefore the focus is on ensuring that a Case Officer has been assigned for the issue is important. All the agreements are entered on the delegation list and the opinions should be submitted in a correct manner according to the standard protocol by the Administrator. If categorization is not done correctly, there is chance that this issue is redirected to wrong division or group. Finally, the Administrator follow ups on the issue until it is solved by the Case Officer. Then they enter them into the Diarium by locating the actions for archiving.

- **Update the issue**
  After allocating a Case Officer for the issue, the Administrator follow ups and has the responsibility to update in the W3D3 when new documents/information or emails arrive related to the request. However, it was mentioned during the interviews that there is a possibility that sometimes the information is provided to the concerned person but might miss to update the same in the system, which happens seldom.

**Case Officer**

The Case Officer in the process map is the second level of support for the UEO also. The Case Officers work on different aspects along with the handling of customer requests. So, the amount of time Case Officers typically spend on this customer request handling process varies with respect to each of the division. The average time spent on working with customer requests
Empirical Findings

handling at Urban Planning division was mentioned as 3-4 hours/week; Operation & Maintenance is 1-3 hours/ day; and Special Public Transport division Case Officers are completely dedicated to work only on these requests. This variation of time allocation is due to the number of issues received for each division and the group. All the Case Officers ensure that their assigned issues are solved according to the customer requirement. The major responsibilities of these Case Officers in this process are as followed:

- **Accepting**
The Case Officer should accept the request from the Flexite/W3D3 IT system and assign them under their names, immediately after they receive. Here, it is important to note that not all the Case Officers work with the requests related to W3D3. As mentioned earlier Special Public Transport does not work with any W3D3 related requests. So, this responsibility will be described according to each division and the group.

**Urban Environment**
The Case Officers receive the issues by getting a notification via functional mail box. Then they have to login to Flexite and check the issue if they are the correct person to solve this. If yes, they accept it and assign it on their name. For W3D3 requests, similar functional mail box notification arrives, and the Case Officers accept to work on it as the assignment will be done by the Administrator. Then the assigned Case Officer checks for requirements if has to be sent to the committee. If no, they get started by analyzing the issue for further processing.

**Operation & Maintenance**
The Case Officers receive the issues by getting a notification via functional mail box as similar to the Urban Environment division. The next steps are also similar to Urban Environment, where the Case Officers login to Flexite and check the issue if they are the correct person to solve this. Similar process for W3D3 requests as well. In this division, in order to be efficient a new IT system called Infra Control has been introduced in May 2018 which is being used instead of Flexite. During the interviews it was mentioned that the Flexite system is hard to use for the issues and therefore, this new system is being introduced. The difference with this system is it can be used as an application in the mobile phones by the customers as well as the Case Officers, Customer Support and Entrepreneurs so that everybody can see the progress on the issues to which they are related to.

**Special Public Transportation**
The Case Officers at Special Public Transportation receive the requests via Customer Support (Flexite), application form and direct calls to them along with direct contact to Case Officers. In this group, on a rotation basis a Case Officer works as a support person who checks the functional mail box, post application forms, attends the direct visit customers in a day and transfers all these issues into their own IT system called Navet. Then, the acting support Case Officer ensures that there is an assignee for every request before the end of the day. In both the above divisions, if the functional mailbox mails are not checked, the requests remain unattended and it was mentioned in the interviews that this happens many times. Although
Empirical Findings

sending an initial response to the customer within two working days of registration of the issue is a common standard for all the offices, it has been observed and understood from the interviews that this is not being followed as a standard routine. On the other hand, it was mentioned that the Special Public Transport group follows to send a response to the customers on the same day of the request arrival. It was also mentioned that the issues which the Case Officers receive directly are not being registered into the IT system, especially when they are the quick response or maintenance issues (issues which should go to Flexite) due to a reason that they respond to the customer immediately and make a note for themselves that they have an issue to work on.

- **Processing the issue**
  Once, the Case Officer accepts the issue (and registers in own system), the routines vary slightly depending on the solution time defined for each type of request. Some of the normal requests can be solved within the same day, while some might take up to a month or few months. The issues related to Special Public Transport group have a defined timeline of application processing time between 4-6 weeks. Otherwise, it is common for all the Case Officers at UEO to first analyze the requests after accepting and if they need any suggestions or help they contact the third level support who are the Division Heads and Office Head. Then, they start to process the issue. If the request is unclear and need further information from the customer, they contact them via provided customer information. If the customer information is anonymous, they should either wait until the same customer contacts back for status update and wait until they get the required information or leave it open until further notice. Such requests pile up for long time and they generate warnings from the IT systems (Flexite, Infra Control & Navet) that the customer request is open and exceeded the lead time. Once, the additional input is received from the customer they process it according to the issue type standards and work on providing solutions to the issues/request of the customer.

A slight variation with respect to issues that are related to W3D3 system is that, the processing time of these requests can be very high. For example, when a request is permission for using municipality’s land for business or private purpose, the Case Officer need to contact different departments, requires various levels of approvals along with several documents from the customer. Therefore, for these issues the processing time can vary from five working days - two weeks – few months again depending on the issue. Therefore, the processing time/lead time has not been focused while mapping the process as it can vary with respect to type of issue to nature of the request.

- **Sending answer to customer**
  The final responsibility for the Case Officers is to provide solution to the customer request. The solution could be in favor of the customer or sometimes a rejection. Whatever, the solution is the Case Officers are expected to provide an answer to the customer. As mentioned in the previous responsibility, the processing time for the issues vary largely and for this reason the customers need to be updated when a request takes longer times for solutions. Generally, the W3D3 issues have estimated time periods for solving the issues and the Administrator follows
up for the actions. But, in the case of the quick response/maintenance issues, during the customer interviews, it was mentioned that they expect to receive answers or solutions sooner. When the Case Officer know that a particular issue takes long time, it is necessary that they send an update to the customer and give a solution time estimation. Similarly, after solving also it is necessary to inform the customer that the issue has been solved. In the customer interviews and employee interviews it has been mentioned that this kind of update/answer is not being provided to the customers, however this happens occasionally. So, in the process map this responsibility has not been mentioned though this is considered as an important step and it is a process step according to the defined process (see appendix 2).

**Head of Division**
The Head of the Divisions at the UEO, seldom involve in the customer request handling process. Here, the head of the Special Public Transport group is also called as head of division in order to avoid confusion. Each division and the group have one head whose responsibility related to this process is to supervise and monitor the Case Officers way of work. Also, when the Case Officers require additional help, they provide them feedback. Sometimes, they receive escalations over the Case Officers decisions which are against the customer requests. During those situations these people will review the customer request and take necessary action. However, during the interviews they mentioned that this happens only in few occasions which is approximately 5-10 issues in a year (together for both Flexite and W3D3 issues). For W3D3 issues, the Case Officers usually have more contact with the division heads with respect to Urban Environment and Operation & Maintenance categories as these requests demand more documentation and routines with some approvals.

In the below *table 5*, the key systems used in the customer request handling process at UEO have been summarized.

<table>
<thead>
<tr>
<th>IT System</th>
<th>Team</th>
<th>Type of issue</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexite</td>
<td>Customer Support, Case Officers</td>
<td>Quick action, maintenance issues</td>
<td>Urban Environment, Operation &amp; Maintenance</td>
</tr>
<tr>
<td>W3D3</td>
<td>Administrator, Case Officers</td>
<td>Change requests, new constructions</td>
<td>Urban Environment, Operation &amp; Maintenance</td>
</tr>
<tr>
<td>Navet</td>
<td>Case Officers</td>
<td>Application requests for special transportation</td>
<td>Special Public Transportation</td>
</tr>
<tr>
<td>Functional Mail Box</td>
<td>Case Officers</td>
<td>Quick action, maintenance issues</td>
<td>Urban Environment, Operation &amp; Maintenance, Special Public Transportation</td>
</tr>
</tbody>
</table>

**New implementation**

| Infra control | Customers, Customer Support, Case Officers, Entrepreneurs | Quick action, maintenance issues | Operation & Maintenance |

*Table 5: Key systems used in the process*
4.3 Voice of the Customer

The Voice of the Customer (VOC) has been identified from the customer interviews which were conducted by calling the customers who had used the services of UEO since the recent year. The questionnaire has been presented in the *appendix 1 – interview guide 3*. Most of the customers gave similar feedback to the questions. There are few customers who were extremely satisfied with the service delivery while most of them were dissatisfied/not satisfied. Further, the citizen survey which was conducted in the end of 2017 has also been considered for analyzing the VOC. The citizen survey results analysis has also provided similar inputs of customer feedback. The *appendix 3* consists of the citizen survey questionnaire and the results with respect to the service quality. All the information has been placed according to the Type of Quality Requirement which are ‘*must be*’, ‘*more is better*’ and ‘*delighters*’ of the Kano analysis model. For example, when the many customers answered that “an initial response is what I expect when a request is submitted” – this is prioritized as a ‘*must be*’ quality requirement. Similarly, other feedback points have been arranged based on the number of customers stressing on certain points. Further, some feedback from employee interviews have also been arranged and prioritized according to the Kano model. Here the External Customers are the citizens and the business owners, where the Internal Customers are employees working within the process. The overall VOC has been presented in the *table 6*, below.

<table>
<thead>
<tr>
<th>Type of Quality Requirement</th>
<th>What Does the Customer Expect?</th>
<th>Who is the Customer?</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>More is better</em> = specified demands and expectations</td>
<td>Direct Service when customer contacts.</td>
<td>External Customers, Internal Customers</td>
</tr>
<tr>
<td></td>
<td>Faster Response by providing information updates via social media, automatic voice recorder in telephone.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More communication with the person handling the issue.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Structured process for handling requests.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easy to find and easy to read information.</td>
<td></td>
</tr>
<tr>
<td><em>Must be</em> = absolute demands</td>
<td>Easier to find the contact information of municipality for any kind of services.</td>
<td>External customers</td>
</tr>
<tr>
<td></td>
<td>Status update on the service request.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Initial Response from municipality.</td>
<td></td>
</tr>
<tr>
<td><em>Delighters</em> = Wishes and unknown delighters (surprises)</td>
<td>Frequent updates on the municipality website about ongoing projects in multiple languages.</td>
<td>External customers</td>
</tr>
<tr>
<td></td>
<td>Develop the Linkoping.se website to be more informative about the municipality developments.</td>
<td></td>
</tr>
</tbody>
</table>

*Table 6: Voice of the Customer (VOC)*
4.4 Critical to Quality

The results from the VOC of the customer interviews has been used to set the CTQ requirements. The need here is an improved customer request handling process. To achieve this main requirement, the drivers have been identified from the VOC (see table 6). Additionally, the author’s observations and brainstorming sessions with the core members gave better understanding of the drivers important to reach the requirement. The CTQ tree has been presented in the figure 9 below:

<table>
<thead>
<tr>
<th>Need</th>
<th>Focus areas “Drivers”</th>
<th>Deployed requirements “CTQs”</th>
<th>Measurements</th>
<th>Performance “current estimated yield”</th>
<th>Goals “target yield”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Easy to get contact with MoS</td>
<td>Number of times the customer finds contact details</td>
<td>45%</td>
<td>90%</td>
</tr>
<tr>
<td>Easy to contact</td>
<td></td>
<td>One point of contact (first level support)</td>
<td>Number of times issues are registered via first level support</td>
<td>60%</td>
<td>98%</td>
</tr>
<tr>
<td>Availability of contact ways in the website</td>
<td></td>
<td>Number of times customers were able to find right contact details</td>
<td>50%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Information about ongoing projects</td>
<td></td>
<td>Number of times the Linköping website is updated about developments of the city</td>
<td>50%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Improved Customer Request Handling Process</td>
<td>Information availability</td>
<td>Update on the information about common problems</td>
<td>Number of times the ongoing problems are published in various social media and website</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>Information to Customer Support team about ongoing problems to answer the customers</td>
<td></td>
<td>Number of times the customer support is informed about various issues which affect the customers</td>
<td>70%</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>Response/Update on issue</td>
<td>Initial response about the issue</td>
<td>Number of times the case officer responded/provided first information on the customer request in time.</td>
<td>50%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Update on the status of the issue like work in progress or solved</td>
<td>Number of times the customer can see the request status on the website by using the ticket number</td>
<td>50%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Common Process for describing the requests</td>
<td></td>
<td>Number of times the the requests are described according to the standard</td>
<td>70%</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Structured Process</td>
<td>Standard templates</td>
<td>Number of times the standard templates is used while responding to customers/while handling the issue</td>
<td>70%</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Standard Process</td>
<td></td>
<td>Number of times the ground process is used irrespective of the IT system</td>
<td>30%</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 9: Critical to Quality Tree (CTQ)*
A total four drivers have been identified for the “need”. Then, the CTQ’s have been set which are the deployed or the specific requirements, followed by setting measurements for them. The measurements have been set by for example, considering “number of times the issues are registered via first level support” for the Easy to Contact driver. Further, in the CTQ tree the current yield over the measurements of the CTQ have been estimated by taking average percentages from the customer interviews and little from the citizen survey. Then, target yield percentages have been set based on the estimated yield.
5 Analysis

This chapter presents the analysis on the empirical findings. From the analysis of the empirical findings, the identified problems in the process will be discussed first, followed by the root cause analysis on the identified problems by using the cause & effect analysis and 5 why’s tools will be presented. The improvement suggestions will be presented by using the Benchmarking and Standardization tools. Finally, the process improvement strategy will be presented.

5.1 Problems Identified in the Process

The customer and employee interviews addressed various problems within the process of handling the customer requests at UEO. Further, the as-is process mapping helped in identifying the stages in which these problems occur within the process. By organizing the VOC, the importance of the problems and category to which the problems relate to has also been identified. From all the information, the problems that have major influence on the process have been presented below:

1. Second level support receiving incoming requests from customers
   According to the defined process, every customer request should either proceed from the Customer Support or the Administrator, then reach the Case Officer for providing solution. When first level support is contacted, registering the requests in the IT systems is the next step to have a track and follow up of the requests. However, in the current customer request handling process as-is mapping it can be seen that customer requests approach directly to second level support as well. Due to different channels of approaching by the customers, i.e., sometimes directly contacting the Case Officers, all the requests are not being registered in the internal systems. This leads to deviation from the defined process and further leads to missing of some issues. The idea behind having database IT systems is to keep a track of all the incoming and outgoing requests, so by not registering into the system results in missing of information as well as there is a high possibility that the person who received the request might forget it later. This will further result in increased customer dissatisfaction.

2. No response/update and Late response on the requests to the customer
   The next problem identified within the process is a response to the customers. When the requests are received, it is a mandate that they should be responded with an “initial response” to the customers within two working days. But, this is not being followed in most of the times and the as-is mapping also does not have any connection of either receiving initial response or update after the issue is solved to customers. The customers complained that they have been waiting for weeks and yet no update, response or information was provided. In the VOC, the must be characteristic is the response to the customer because almost all the customers mentioned that they had to call the Customer Support Team to get the status of their issue, otherwise no one would have called them back. On the other hand, Case Officers mention that customers do not respond sometimes when they contact them. This problem further led to delays in handling the customer requests, resulting in dissatisfied customers. However, it has been observed that in most cases, the primary step – initial
response, which is just a confirmation to the customer that their request will be taken care is not done with every issue.

3. **Difficulties with the current IT systems**
   The MoS department uses different IT systems with respect to every office, division and issue/request type. This causes confusion while registering from one system to other and almost every employee interviewed within UEO addressed that the current systems are difficult to work with as they are not feasible to work according to the process. This has been identified from the as-is process mapping but was confirmed only during the interviews. Further, it was addressed that the Flexite and W3D3 IT systems are not Case Officer systems and they hinder in customer interfacing (no option to contact the customers via systems).

4. **Difficulty to find contact information**
   The first problem identified in the process is the mode of contacting MoS. There are various modes for the customers to contact MoS, and this feasibility is to ensure that MoS is accessible for the customers from many ways. But, many of the customers complained that they were unaware of the right contact information and the sources of communication. In the interviews they mentioned that it was difficult to find where to send their requests as Linköping municipality is what they see from outside and unaware of these departments. Further, few mentioned that there are lot of stages to get to the correct link via website. Most of the times they call the Linköping municipality exchange number (central customer support of the municipality) and they redirect them to the MoS customer support. This has been identified as an important problem while arranging the VOC and the CTQ tree. Also, the employee interviews mentioned that this is an existing problem and sometimes result in contacting wrong department instead of MoS leading to customer dissatisfaction.

5. **Unclear/less information sharing to the customers**
   During the customer and employee interviews, it has been noted that information is not shared always with the customers. For example, if there is a pot hole in a street which affects the traffic should be updated as an important notification. This is an actual protocol which has to be followed. But, it was mentioned that this might not happen always, or the updates could be in the webpage of MoS but not on the main home page (www.linkoping.se). Some of the customers also mentioned this during interviews and has been selected as an important issue from the arrangement of VOC and CTQ. As a result of this improper information sharing, many customers send complaints on the same issue and the number of requests increases unnecessarily. On the other hand, sometimes important announcements, development projects, municipality developments are missing to reach the customers. Additionally, Case Officers mentioned that some of the customers send incomplete applications and the customers said that how would they know what to be sent if the information is not clear on the website.
6. **Different approaches of working in the process**

Different case officers have different issues to work so there is a difference in the way of their working method. This deviates sometimes from the process leading to non-conformity with the standard working process. Additionally, handling method of similar issues might vary from one person to another where one might deal the issue within two days, while other might take longer time. While the roles and responsibilities were explained by the Case Officers during the interviews, this problem has been identified.

7. **Challenges in prioritizing the requests**

During the interviews with the employees, it has been mentioned that sometimes they face challenges to prioritize any particular issue. For example, a customer has emergency and require solution within one day, which is not possible. But when the issue is estimated to affect large group can be prioritized but not the customers. So, this sometimes creates dissatisfied customers because their issue is an emergency from their point of view. Further, the variations in customer requirements also cause the challenges for prioritizing some requests.

5.2 **Root Cause Analysis**

The root cause analysis has been made on the problems addressed in 5.2 section. This analysis has been performed in order to identify the underlying issues of the visible problems with the core members of the process during interviews and brainstorming sessions. While performing the analysis using Cause & Effect and 5 why’s, It has been observed that some of the problems were interconnected to each other. As it is important to verify the root causes, they have been verified with the core members working with the process by conducting group meetings.

5.2.1 **Cause & Effect Analysis**

The Cause & Effect analysis has been performed on the problems 1, 2 & 3 mentioned in the previous section. These problems were identified to have various root causes in relation to different effects for the same problem. Thus cause & effect analysis has been appropriate for these problems - Second level support receiving incoming requests from customers; No response/update and Late response on the requests to the customer; Difficulties with the current IT systems

The 7M’s – Measurement, Machine, Method, Man, Material, Milieu and Management have not been used completely. Some effects were taken in relation to the process and the problem, as this is a service process and the presence of effects such as materials, machine is limited. Some of the root causes have been identified in combination with the 5 Why’s tool, which was reaching the actual root cause by questioning five times. While some were identified in simpler way. The analysis and the verified root causes have been presented below, where the highlighted (bold text) are the selected root causes for that effect of the problem.
Analysis

1. Second level support receiving incoming requests from customers

In the figure 10, the probable causation of problem 1 can be seen. All the selected root causes are not verified, the verified and true root causes for this problem are:

- Information not clear for customers
- Lack of routines
- Customers contact because they received responses for earlier issues from that Second Level support person.

![Cause & Effect analysis of problem 1](image)

2. No response/update and Late response on the requests to the customer

In the figure 11, the probable causation of problem 2 can be seen. The verified and true root causes for this problem are:

- IT systems does not have option to respond back to customer via same system
- Complexity of issues leads to delays in response
- Lack of information to customers leading to more questions, for this reason the Case Officers do not prefer to respond to customers
- Customers unavailability
- First level support has limited accessibility and knowledge on issues, so they should wait for Case Officers response to answer the customers.
- Lack of management involvement.
- Lack of standardization.
3. Difficulties with the current IT systems

The below figure 12, shows the probable causations of problem 3. The verified and true root causes for this problem are:

- Flexite system not suitable for Case Officers use
- Variations because of different IT systems for one issue
- Statistical analysis not possible, because of non-registration of all the incoming issues which is due to lack of standard approach.
- Introduction of new systems always, thinking they will solve the issues.
5.2.2 Five Why’s

The 5 Why’s analysis has been performed on the problems 4, 5, 6 & 7 mentioned in the previous section. The causation of each problem has been asked five times to get to the actual root cause. The following problems were chosen to perform the simple 5 why’s instead of cause & effect because, these issues are simple, and the root causes were found out easily for the problems. As they lead to only one root cause, they have also been verified with the core members working with the process. When the root causes were identified as not true, new set of 5 why’s have been tried and here only the verified and true ones have been presented.

4. Difficulty to find contact information

From figure 13, it can be seen that the root cause for this problem is identified as the lack of understanding/research on customer perspective. It has been analyzed that though the organization is striving to improve customer satisfaction, the focus on the customer should be increased and make the contact information availability more customer friendly.
5. **Unclear/less information sharing to the customers**

From *figure 14*, it can be seen that the root cause for this problem is identified as no clear strategy on sharing information to customers, which is also due to lack of planning. It has been analyzed that though the information is shared and published on the website, there is still many parts which are to be highlighted and updated. Further, any important updates and public announcements published on the first link of the municipality website is what the internal and external customers expressed to view.

**Problem Statement: Unclear/less information sharing to customers**

- Why? Important information are not updated and highlighted in the website & social media
- Why? Information is given only to those customers who enquire
- Why? Improper communication systems for information sharing
- Why? There are many ways of information sharing so misses to update everywhere
- Why? Due to lack of understanding/research on customer perspective

*Figure 14: 5 why’s of problem 5*
6. Different approaches of working in the process

From figure 15, it can be seen that the root cause for this problem is identified as lack of standardization of the working process. It has been analyzed that though the Case Officers area of expertise is different and the requests they usually work on vary, there could be some standards or standard protocols that could be followed while working with the customer requests.

Problem Statement: Different approaches of working in the process

Why?  → Case officers follow their own approaches
Why?  → New updates are not followed up
Why?  → They are not informed about new updates
Why?  → The management does not send updates
Why?  → Unclear process approach due to lack of standardization

Figure 15: 5 why’s of problem 6

7. Challenges in prioritizing the requests

From figure 16, it can be seen that the root cause for this problem is that the MoS being a government organization (public sector) cannot prioritize any requests by going against the laws. Though customer satisfaction is important and a priority, doing this in the limit of fulfilling laws and regulations is mandatory. However, there will be some customers who will be dissatisfied because of this and it depends on MoS, how they handle such situations.

Problem Statement: Challenges in prioritizing requests

Why?  → It is not possible to prioritize based on emergency for individual customer
Why?  → Issues can be prioritized not customers
Why?  → Issues which affect large group can be prioritized
Why?  → The rules and regulations are not feasible to prioritize any individual customer
Why?  → MoS cannot go against government laws

Figure 16: 5 why’s of problem 7
The root causes identification and verification led to the next step in the research, which is the generation of suggestions for a better customer request handling process. The first three problems have various root causes that were verified. A summary of the problems and root cause has been presented below in **table 7**:  

<table>
<thead>
<tr>
<th>No.</th>
<th>Problem</th>
<th>Root Causes</th>
</tr>
</thead>
</table>
| 1   | Second level support receiving incoming requests from customers | Information not clear for customer  
Lack of routines  
Customers contact because they received responses for earlier issues from that Second Level support person |
| 2   | No response/update and Late response on the requests to the customer | IT systems does not have option to respond back to customer via same system  
Complexity of issues leads to delays in response  
Lack of information to customers leading to more questions, for this reason the Case Officers do not prefer to respond to customers  
Customers unavailability  
First level support has limited accessibility and knowledge on issues, so they should wait for Case Officers response to answer the customers.  
Lack of management involvement |
| 3   | Difficulties with the current IT systems | Flexite system not suitable for Case Officers use  
Variations because of different IT systems for one issue  
Statistical analysis not possible, because of non-registration of all the incoming issues which is due to lack of standard approach  
Introduction of new systems always, thinking they will solve the issues |
| 4   | Difficulty to find contact information | Lack of understanding/research on customer perspective |
| 5   | Unclear/less information sharing to the customers | No clear strategy on sharing information to customers/Lack of planning |
| 6   | Different approaches of working in the process | Lack of standardization of the working process |
| 7   | Challenges in prioritizing the requests | MoS being a government organization (public sector) cannot prioritize any requests by going against the laws |

*Table 7: Summary of problems with root causes*
5.3 Improvement Suggestions

After identifying the problems and performing root cause analysis on them, the improvements suggestions have been identified by using benchmarking and standardized work tools. Further, during the interviews, it was asked to the interviewee the possibility of improvements for the problems and they have also been considered.

An internal benchmarking has been chosen to perform with one of the internal office - The office for Public Health and the Environment which is Miljökontoret (in Swedish). This office has been chosen by the Process Leader after certain analysis. As the customer request handling process is the ground support process for entire MoS and the routines and approaches vary in each office, the handling approach at Public Health and the Environment office have given very useful tips on how the customer request handling process can be improved for the UEO. During the benchmarking meeting, it has been stressed that leadership plays a vital role in implementing the improvements as they are the responsible persons to monitor the employees working process. There should be clear guidelines from the leaders to the employees on what and how to work with the process. Further, it was mentioned that although there is education and documentation availability on the process and the systems, if there is lack of monitoring from the leaders all the efforts are wasted. An interesting point observed in the benchmarked office is that they follow ISO 9001 quality management standards. This shows the customer orientation and customer focus of the office. Additionally, the benchmarking has provided inputs for simple and feasible solutions to increase the efficiency of the customer requests handling process at UEO.

On the other hand, the standardization tool has been used as a baseline to set up standard work, and the process steps which can be standardized and what sort of requirements are to be considered for standardization have been identified and presented.

The improvement suggestions have been made and presented below. However, these are just suggestions from the analysis and meetings conducted. These suggestions have been developed together with the supervisor at the Linköping Municipality. The below table 8, summarizes the suggestions and the tool used in the suggestion generation.

<table>
<thead>
<tr>
<th>Suggestion</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamlining incoming requests flow</td>
<td>Benchmarking, Standardization</td>
</tr>
<tr>
<td>Increase Responsiveness</td>
<td>Benchmarking</td>
</tr>
<tr>
<td>Case Officers as internal support at division level</td>
<td>Benchmarking</td>
</tr>
<tr>
<td>Proper use of IT systems</td>
<td>Benchmarking</td>
</tr>
<tr>
<td>Information Sharing</td>
<td>Standardization</td>
</tr>
<tr>
<td>Quality Meetings</td>
<td>Benchmarking</td>
</tr>
<tr>
<td>Documentation of Standards</td>
<td>Standardization</td>
</tr>
<tr>
<td>Continuous Customer Feedback</td>
<td>Benchmarking</td>
</tr>
</tbody>
</table>

*Table 8: Summary of suggestions with tools used*
• **Streamlining incoming requests flow**
  The first improvement suggestion is for problem 1 and it is streamlining the incoming requests flow. The Case Officers receive emails or calls directly from customers to register their request. As it is not a good idea to ignore the customer calls and emails, the Case Officers should ensure that they respond to the customer by mentioning that their request will be sent to the first level support and they will redirect to the corresponding team. This kind of routines will enhance registration process, which will further help in having a track of all the incoming issues. This leads to further standardization of the registration step in the process.

• **Increase Responsiveness**
  This improvement suggestion is for problem 2 and 6. Initial response to the customers within two working days should be made a standard routine to all the employees. This rule is being followed by all the other offices for 5 years which was mentioned during benchmarking meeting. So, once the request is registered in the system, an initial response with a confirmation that the request will be addressed should be made as a standard response method. This further should be emphasized by the management/leaders probably by sending a communication email to all the employees at UEO. Further, to standardize this routine monthly follow up reviews should be performed by the division head.

  Further, when a customer asks for follow up and updates, it should be followed. This can be done by sending status updates to the customer for every 5 – 10 days (if the issue takes longer time). Also, along with the initial response, a standard mail mentioning that the issue has been resolved should be used. This suggestion came up during the interviews and meetings. The Case Officers mentioned that some of them do this, while some don’t follow this routine. So, standardizing this routine keeps the customers satisfied.

  For problem 2, the root cause is that the first level support has limited access to Case Officers systems and as well as limited authority and knowledge on solving the issues.

• **Case Officers as internal support at division level**
  This suggestion is also relevant to problem 2. In the benchmarked office, the Case Officers on a rotation basis monitor the incoming requests in the functional mail box and ensure that every issue is assigned to Case Officer along with an initial response to the customer. Similar protocol is being followed in the Special Public Transportation group of UEO. So, it is suggested that the remaining two divisions at the office also implement this idea which can help in reducing the number of unattended requests.

• **Proper use of IT systems**
  This improvement suggestion is for problem 3. Currently there are manuals which describe the process of registering the requests in the IT systems. This shows a lot of emphasis and focus on the IT systems. But, from the root cause analysis, the problems with the existing systems has been identified as different systems create confusion and sometimes the issues
get lost while transferring from system to other. It is also true to some extent because the current Flexite and W3D3 systems have some limitations such as unable to send response back to customers via system. The new system called Infra Control has been started for Operation & Maintenance issues which has a feature to contact the customer via system as the customer has the accessibility to install this application on their mobile or tablet. The employees and management believe that new systems improve the process efficiency. But it is important to note that problems don’t get solved by implementing new systems and sometimes lead to more confusion for the people working within the process. During improvement discussions, the case officers mentioned that while implementing new systems, it is important to ask the staff the purpose and keep those systems, keep the requirements and should fulfill them. So, it is suggested that a feasibility study should be performed by consulting the Case Officers and review on the existing systems.

During the benchmarking, it was learnt that the systems are not being used completely at UEO and always looking for better systems by assuming that the existing systems are not helpful for working with the customer requests process. So, streamlining the process by making standard protocols such as registration, initial response, update, solve and send the final to response to customers should be made mandatory irrespective of the system usage. This can further help in having the process standards with possibility to retrieve data for any statistical analysis. Additionally, the system used at Public Health and the Environment have the possibility to save the documents. There are number of documents available for the UEO with lot of duplications and unstreamed path. For example, one kind of issue process can be found in one folder while others in another folder creating a havoc. If the documents can be readily uploaded in the system, can make it easier to access the documents without any confusion. Therefore, additional sessions on the complete usage of the existing systems should be looked upon because as of now, nobody is sure if this can be possible with respect to UEO systems. Further, documentation of the advantages and features of the systems in addition to training will help the employees as future references.

- **Information sharing**
  This suggestion is for problem 4 and 5. The obvious suggestion for making the contact information availability and information updates to customers is updating the website homepage. The updates should include information about the requirements for certain requests such as the complaint process, application forms and update of solution times. These will give a standard approach to work in the process as everything is visible and transparent to both the internal and external customers.

  This suggestion might need time and effort but will definitely increase the customer satisfaction. Therefore, the management should focus on looking for best options to highlight the MoS contact information and support modes on website. Further, news feeds on the social networking sites such as Facebook, Instagram and Twitter can be used for highlighting the information to reach large number of customers. As they are already using these media, additional updates can help in informing about important updates to large number of customers.
• **Quality meetings**

This suggestion can be useful in general to all the problems. A monthly review on the process by the management of UEO, on the service quality and process updates is suggested. The benchmarked office conducts this every month and expressed that these meetings bring up the existing problems and uneven work distribution in case of any to the management notice. Also, if an employee performs same tasks in an efficient way, they are noted down in routines where other can see and follow. So, if these meetings can be conducted in UEO, the management will be able to identify continuous improvements for their process.

• **Documentation of Standards**

All the above-mentioned suggestions lead to documentation of the routines, standards and processes. This is mostly missing in the process at UEO. Therefore, it is suggested that the standard process suggested for problems 1, 2, 3 and 6 should be documented and made easily accessible by all the employees working within the process. Making standardized work steps in the process and documenting them provides references for the employees to follow the process protocol and eliminate the gaps (can be considered as wasteful steps) in the customer request handling process and help in the smooth running of the process.

• **Continuous Customer Feedback**

During interviews with other offices employees it has been noted that all the departments collect customer feedback on a regular basis, either from the help of consultants or by contacting the customers to send a feedback after solving their requests. The benchmarked Public Health and Environment office gather feedback from each customer after solving their issue. Further, they perform a survey monthly in collaboration with other offices of the MoS to the customers who were in contact with them for a service and the evaluation of all the survey results is performed yearly. This idea can be implemented in the UEO as well because, this is the only office which deals with daily maintenance issues where a lot of customer interaction takes place. At least a quarterly survey with the customers who were in contact with UEO for a service request would help them in understanding the status of their working process and plan for further improvements. In this way, the customers voice can be heard frequently.

These suggestions when implemented systematically can benefit the UEO to achieve higher customer satisfaction and reach their targets. Further, leads to have a clearer process flow for the people working within the process as well as the external customers. Eventually all these can lead to efficient process that meets the customer requirements and needs.

5.3.1 **Process Improvement Strategy**

From the overall review on the results and analysis, the usefulness of the tools can be observed. In order to receive the desired results such as the identification of problems, root causes analysis and solutions generations, the order in which these tools can be used is considered to be important. The strategy for process improvements with increased customer satisfaction is the application of tools in a disciplined order as applied in the results and analysis chapters. The order of the tools can be highlighted to be important.
The three-step strategy for process improvements is as followed – First step, the identification of the roles and responsibilities, gaps in the process have been clearly understood with the help of As-Is process mapping. Simultaneously some of the problems were even identified while analyzing the VOC. The VOC further helped in identifying the customer needs, where they were transferred into quantitative targets by CTQ tool. These three tools have been used in the first order parallel to each other, which clearly stated the problems. Second step, the root causes of the problems were identified with the help of Cause & Effect analysis and 5 Why’s tools which led to the next step of focus towards betterments. Third step, the solutions were developed with the help of Benchmarking and Standardization tools.

The *figure 17*, depicts the process improvement strategy that has been applied on the Customer Request Handling Process at UEO of the MoS department. This has been further discussed in the chapter 6.

*Figure 17: Process Improvement Strategy*
6 Discussion

This chapter consists of discussion on the connection between the theoretical frame of reference and the results. The discussion on the selected tools is presented by commenting to what extent the tools support for the analysis and process improvements. In the last section of this chapter, a discussion on the choice of the method, research approach and data collection will also be presented.

6.1 Results Discussion

The results showed that there is significant relation to the theoretical frame of reference with respect to public service sector. The service quality characteristics defined by Parasuraman et.al., (1985), are Access, Communication, Competence, Courtesy, Credibility, Reliability, Responsiveness, Security, Tangibles, and Understanding the customer. These characteristics are visible in the customer request handling process at UEO and the characteristics Responsiveness, Understanding the customers and Communication played vital in this case study. Further, as mentioned by Boyne (2002), the variation in the requirements of the customers can be reflected from the results. The customer requests are largely varied, and this affects the quality and customer satisfaction. As it challenges in fulfilling each and every customer. The UEO seems to be ready to handle the variations in customer demands as they are aware from the beginning that they cannot satisfy every citizen, customer or business owner of the municipality. However, a little deviation from the customer orientation has been observed during the period of the thesis case study, with reference to the prioritization of the requests. Furthermore, as said by Fountain (2001), the Customer term is complex and not defined clearly here. It is often common to confuse that customers are always citizens. So, during the interviews when asked “who is the customer of the process?”, most of the interviewees answered the citizens and explained the process from citizen perspectives. So, a confusion on who is their customer can be clearly seen. This is common in most of the municipal public-sector services because, they work in a perspective that they are serving the citizens (Fountain, 2001; Alford & John, 2002). But, there are different roles of a customer in this case which is the business owners, internal customers (other departments) and politicians along with citizens.

As highlighted by Bhatia & John (2008), about the monopoly of the public sector, though it is true in the case with MoS organization, the attitude of the organization towards serving their customers is very much customer oriented. The organization is very much striving to have increased customer satisfaction, improved service delivery and quality standards. Although, the point that public services are supplier led is agreeable. The obsession of installing new IT systems and assuming that these systems will increase the process efficiency, without actually inculcating system thinking and process orientation is a typical characteristic of public sectors (Gulledge Jr & Sommer, 2002; Bhatia & John, 2008). During several conversations with the supervisor and on the benchmarking meeting, this point has been highlighted and they agreed with the MoS scenario. The IT systems which will be used should be in line with the processes which develops process orientation.
Discussion

Further, when process orientation was analyzed at the case company, the process maps have been looked thoroughly. All the offices processes are well connected with each other in the process map which is available at the organization’s intranet, but the mapping seems to be quite complex. It took time for the author to find the actual customer request handling process as the mapping was done to provide connection between offices and the three levels of processes. The three levels of processes – Main Process, Support Process and Management Process are clearly defined in the process handbook (Bergman & Klefsjö, 2010). However, as mentioned before, it was difficult to understand the flow in one go because of the complex connection between the process levels and the offices. According to Cole (2011), generally the processes are quite complex in public sector and this is proven with the MoS processes. The basic idea of process mapping is to understand how the processes work which has to be in a straight and easy way (Bergman & Klefsjö, 2010). But here it seems to be difficult and when questioned about the process maps to the employees, almost everyone answered that they don’t have any knowledge about those process maps and they don’t usually follow. Also, the general process mapping presented in the appendix 2, is incomplete according to the process leader and needs to be updated according to every office’s working process.

The typical public-sector process orientation can be observed from this case (Gulledge Jr & Sommer, 2002). The organizations working in public sector though strive to achieve process management, first it is important that the concepts of customer orientation, process orientation and quality should be imbied into the culture of the organization (Jurisch, et al., 2014). At the case company, these concepts are in the learning stages though they have ambitions for having increased customer satisfaction. At any organization, to improve a process employee and management involvement are considered important (Liker & Meier, 2006). The hierarchical organization structure and organization culture has a major effect on the working process (Gulledge Jr & Sommer, 2002). According to Boutros & Purdie (2014), the information sharing, and transparency are the features for successful process improvements but though there is transparency in the process, information sharing is not done completely, and this has been highlighted as one of the problems.

It has been observed that there is a lot of data available to perform statistical analysis on the process performance. Indeed, the statistical analysis provide solid proof for the identified problems and generating solutions (Antony, 2006). However, when the entire process has been considered, there are gaps between the data. For example, either a request is registered in one system and solved in another system, requests are not registered, requests are solved but not closed. The public sectors are known for having lack of data availability for performing statistical analysis and though there is availability of some data, the system functionality limited the use of statistical analysis (Antony, 2006). Further, according to Maleyeff (2007), the barriers for implementing process improvements in public sector such as leadership involvement, laws and regulations, and undocumented processes and routines can be observed in this case as well.

So, from the suggestions of reviewed literatures, the tools have been introduced to see if the barriers can be overcome and improvements can be possible. Further discussion of the tools has been provided in the next section of this chapter.
6.1.1 Discussion on the Selected Tools

The tools have been used as a strategy for process improvements at the case study organization (Maleyeff, 2007). The tools were selected from the Six Sigma and Lean methodologies. All the selected tools contributed to the process improvements in some way or the other. There have been contradictions in the literature reviewed about using tools alone for process improvements instead of a complete methodology like Lean or Six Sigma. For example - Liker & Meier (2006), criticized that tools alone cannot be applied without imbibing the principles of the methodologies into the process, while discussing about Lean philosophy. On the other hand, Radnor (2010), argued that in a government organization it is helpful to start by using basic tools instead of a complete methodology implementation. So, considering arguments like the above, this thesis tried to imply the tools directly in an environment where using these methodologies is not common. The usage of tools individually has resulted in most of the discussions in comparison to the theoretical frame of reference. Further, as suggested by Maleyeff (2007), the use of tools has been used as strategy for the process improvements in the case of UEO. Further, the strategy is to utilize these tools in the order in which they have been presented in the previous chapter. Here is the discussion on how each tool contributed for process improvements in connection to the theoretical reference.

Process Mapping

The Process Mapping tool has contributed majorly in the case study of the customer request handling process for improvements. The as-is process mapping helped in visualizing the actual flow of the process. Although, it did not help in developing improvement suggestions, this has been a powerful tool to identify the problems, clarify the roles and responsibilities of the people working in the process. With the help of this process mapping, the activities performed by each role were defined structurally, which further resulted in developing clear instructions to the people working in the process as mentioned by Boutros & Purdie (2014). Further, the whole process has been able to be visualized from a customer perspective (Pyzdek, 2003). The process initially seemed to be simple and straight when viewed from the defined process, but the as-is process map proved the complexity in the process of handling customer requests which is a typical public-sector characteristic (Cole, 2011).

The problems with the flow of incoming requests, responsiveness, and usage of the IT systems have been identified from the as-is process mapping. As mentioned by Melan (1995), all the steps that are required for mapping a process have been undergone during the as-is process mapping. The interviews form the process participants, author’s observations and documented process maps with descriptions gave valuable inputs in streamlining the process. This also clarified the differences between the defined process and how the process has been working in reality (Brook, 2014). One major problem has been identified while using the tool which is the amount of time one has to invest in mapping the process. Collecting the inputs from the employees and visualizing the process and further follow ups to revise the process maps requires time and involvement of the employees. Further, when considering the customer inputs and
mapping it along with employee inputs had made its sometimes hard to grasp and make the connections between the process steps.

Along with these, the steps which are standard throughout the process have been identified and used for the improvements. In the public service sector, process mapping is a valuable tool to understand the complexity of the working process and streamline it with the customer perspective (Cole, 2011). The defined process was mapped from the employee perspective, where the incoming requests were not defined. When mapped a process from customer perspective, it gave an understanding for what went wrong with the process in keeping up the customer expectations.

**Voice of the Customer**

The VOC by Kano analysis has helped in evaluating the customer requirements on the priority levels of the three categories – *must be, more is better, and delighters* (Brook, 2014) Even though there are many ways of collecting customer feedback such as surveys, focus group interviews, and direct interviews; the most common way is sending surveys and evaluating the results of the surveys (Brook, 2014). But, for this case study, due to the time constraints and assumption that many customers might not respond back, a telephone interview with them has been chosen. These interviews worked better as the customers who were willing to provide feedback clearly mentioned what are their requirements and what do they think about the services provided by MoS. On the other hand, it was time consuming and customers who were willing to answer were quit less. When a total of 30 customers were chosen and called for feedback, only 19 responded and patiently answered the questions. So, the generalization of the VOC was little difficult, but a survey that was conducted in 2017 has been taken to compare the results.

In public sector, usually conducting customer feedback sessions are said to be performed rarely and when conducted, it provides very valuable insights for developing a process (Cole, 2011). This has provided the information about the gaps between the customers perspective and the municipality (MoS) perspective. The employees were in a perception that they were doing their job rightly and the process is running smoothly. But, when the customers feedback has been arranged and put forward, they have gained a clear understanding on what is going wrong with the process. Further, the internal customers who are the employees, voices have also been considered for the VOC and this has been collected during their interviews. They expressed the problems which they face while handling the requests and they have helped while developing the CTQ's and the root cause analysis. Finally, the VOC tool will be helpful in increasing the customer focus because form the customer reviews, the organizations especially in public sector will be able to understand the customers better as there is a problem in defining the customers and understanding their wide range of requirements in public sector (Alford & John, 2002).
Critical To Quality

The CTQ tool did not directly help in identifying the problems or developing the improvement suggestions. But, helped in arranging the customer requirement quantitively which led to inputs for the improvement suggestions. The CTQ’s that were arranged for this case might change over time, because of the dynamic nature of the customer requirements in public sector settings (Antony, 2006). As stressed by the Antony (2006), it can be seen that the CTQ will change in future, because of the change in requirements as well as the number of customers for the service. The CTQ further helped in breaking down the broader customer requirements to smaller requirements and then to goals in order to have specific target limits while looking for the improvements (Boutros & Purdie, 2014).

Although, CTQ tree is found to be quite useful for setting up the target specification, there was difficulty in arranging the verbal data quantitatively. All the customer interviews were telephonic interviews, and this had to be arranged into criteria’s and calculated the values by looking how many customers expressed this requirement and what is the current yield of the requirement. Calculating the current yield was also equally difficult because there was not quantitative data available on the arranged requirements. So, the brainstorming sessions with the supervisor helped in evaluating the estimated percentages. Further, during some employee interviews these percentages were mentioned and asked if they have any suggestions. However, these requirements are not usually measured and therefore an estimation was only given for this case. On the other hand, the results from the survey weren’t of much help in arranging the CTQ yields.

Cause & Effect Analysis

The Cause & Effect Analysis had contributed for identifying the underlying root causes for the problems. The brainstorming sessions had to be conducted in order to make this analysis and it contributed to a lot of innovative and interesting root causes (Brook, 2014). These diagrams showed the root causes of the problems and the relation between them. Some of the root causes, were repeated for another problem and sometimes for the same problem with different effect. This made sometimes difficult to choose the root cause thread.

The case seemed to be predictable until problems identification, but when the root cause analysis was made by this diagram, a lot of linkages between the problems was observed (Brook, 2014). Sometimes it became hard to fit everything on one fishbone. This tool could not be used until the problems were identified in the process. Even though during interviews, some problems were identified, making a complete cause & effect analysis seemed to be too early to use. In the later stages, when all the problems were identified, this analysis has begun.

The 7M’s that were actually defined for using this model were found not to fit to the scenario always and the author has chosen to use the effects which were related to the process context from the suggestion given by Brook (2014). Further, it has been observed that assuming 7M or 7casues was not necessary for all the analyzed problems. Also, this tool is observed to be time consuming due to the involvement of the people in several brainstorming sessions. Although some root causes were able to be verified during the brainstorming sessions and information gathered from interviews, as part of the process a separate verification had been conducted for
verifying these root causes. This session has led to more root causes generation. So, from the author’s previous experience with the tool usage and on process at the case company, the root causes that were relevant and important had to be presented to make it visible and understandable under the supervisor’s advice.

**Five Why’s**

The root cause analysis using 5 why’s tool has been the most useful and simple technique. It has contributed to identifying the root causes of the problems and this further provided inputs to solution developments. This tool has been used as an alternative root cause and effect analysis for some problems and for problems 1,2 &3, it has been used along with cause and effect analysis. Further, this tool was used while collecting data during the employee interviews. According to Liker & Meier (2006), the 5 why technique is a very simple and easy tool to find the underlying root causes of the problems and it proved to be simple and easy to use by easily directing towards the root cause of the problem with respect to this case which is a public sector.

There was not much literature mentioning the use of five why’s in public sector, the author was skeptical on how this works and the results from the analysis proved that this is very convenient and simple tool for root cause analysis. During the brainstorming sessions, the employees preferred to use the simple 5 why’s instead of the cause and effect analysis as it was easy to get to the root cause.

**Benchmarking**

The benchmarking tool directly contributed for the improvement suggestions for the customer request handling process at UEO. Additional improvements have also been identified from this tool.

As mentioned by Cole (2014), this tool is very powerful to identify the best practices from the counter partners and try to adapt them to the process. In this case, the benchmarking has been done with an internal office – Public Health and Environment office, because there was no possibility to get the contact information about other municipalities. Further, contacted municipalities delayed in response and due to time constraints, the best performing office has been chosen based on an internal evaluation among the offices. The main criteria for choosing a partner for benchmarking is that whether the other party is willing to share the information or not (Cole, 2011). The final choice for benchmarking came from the supervisor at MoS. This however, has not affected in developing improvement suggestions.

The customer request handling process of the Public Health and Environment office has been studied and analyzed first. Then, an in-depth interview with the division head provided valuable insights on how their process is working. In order to achieve this, the steps in the benchmarking process given by Bergman & Klefsjö (2010), were reflected. Further, as stated by Bergman & Klefsjö (2010), the problem with benchmarking has also been observed with respect to this case where the similarities in the process sometimes influenced to simply copy the approaches from Public Health and Environment office. However, the improvement possibilities have been
cautiously chosen where the suggestions suited specific to the UEO customer request handling process.

As stated by Cole (2014), a sense of urgency and need for improvements implementation has been observed when the results from the benchmarking were discussed. Further, (Bergman & Klefsjö (2010), mention that benchmarking is possible when they are not competitors as the companies usually will not be ready to share information with their competitors. However, in the case municipal organizations which are the public service sectors, they are run by monopoly and the organizations does not have any competitors. So, it is comparatively easier to make a benchmarking analysis in public sector. As in this case, due to lack of response from the other municipalities, the internal benchmarking has been chosen to be the best option.

The benchmarking was easier and not complex because, the process at the office is similar with variations in the routines. The potential differences in handling the customer requests payed way to identify the improvement suggestions. From the results of the benchmarking, the current process at UEO is to be questioned because, same process is being excelled at another office within the same department. While the UEO, is struggling to achieve the customer satisfaction and qualitative service delivery.

Finally, it can be said that the benefits of benchmarking can be potentially high with respect to the public sector because of not being competitors with each other and every organization is governed by the laws and regulations from the people’s elected members.

**Standardization**

The standardization tool has not directly contributed to any improvements in the process. In fact, the improvement suggestions were to standardize certain steps in the process.

The steps that can be standardized were identified from the process mapping tool instead. Liker & Meier (2006), mention that the wasteful activities can be eliminated with the help of standardized work tool. In this case, the wastes such as variation, lack of customer focus, delays and unclear communication were clearly visible, which are the typical wastes of service sector (Bonaccorsi, et al., 2011). By standardizing some of the process steps, that were mentioned in the chapter 4, the standardization can be achieved.

In the case study, which is a public service sector, it can be observed that it is difficult to make standardized work because of the nature of the process. The routines vary with the customer requirements which are very broad. However, as mentioned by Radnor (2010), due to the mandate for laws and external pressures from politicians, difficulties to standardization can be observed in this case. He further discusses that routines can vary, and process steps should be standardized in such environments and this is exactly the case at UEO. The routines vary from issue to issue, but the process steps such as registration, and response mentioned in the improvement suggestions can be standardized.

In conclusion, the standardized work tool can be used for the improvement suggestion in the public service sector, but one should be careful while identifying the standardization possibilities. The reason for this is that, in the dynamic environment of customer requests in public service sector, standardizing everything might not be possible.
The summary of discussion on each tool for process improvements in the public sector have been summarized and presented in the table 9, below. Also, the table shows the strategic order in which these tools can be used.

<table>
<thead>
<tr>
<th>Order</th>
<th>Tool</th>
<th>Contributions for Process Improvements</th>
</tr>
</thead>
</table>
| 1     | Process Mapping (As-Is/ Swim Lane mapping) | - Helps in understanding large complex processes  
- Helps in understanding the roles and responsibilities  
- Problems in the process can be identified |
| 2     | Voice of the Customer – VOC (by Kano Analysis) | - Customer Focus can be improved  
- Customer requirements can be prioritized  
- Requires proactive management to continuously collect the customer feedback |
| 3     | Critical to Quality - CTQ | - Helps to translate the customer requirements quantitatively  
- Helps to measure the current yields and set targets accordingly  
- Inputs for improvement suggestions |
| 4     | Cause & Effect Analysis | - Helps in identifying the root causes with respect to several aspects  
- Requires time and employee involvement  
- Can be complex with many root causes  
- Sometimes might lead to confusion |
| 5     | 5 Why’s | - Helps in identifying the root causes directly  
- Easy to use  
- Can be used either in combination with Cause & Effect analysis or instead of the Cause & Effect analysis. |
| 6     | Benchmarking | - Very useful to identify improvements  
- Needs to be used cautiously without copying the benchmarked process  
- Cannot directly use without prior analysis |
| 7     | Standardization | - Can be used in combination with process mapping and benchmarking  
- Should first identify the steps to be standardized  
- Cannot directly use without prior analysis |

*Table 9: Summary of discussion on tools for process improvements in public sector*
6.2 Methodology Discussion

The method and research approach were proven to be appropriate and helpful for the case study. The study’s methodology played a key role to achieve the purpose of the study.

The difficult part in the thesis was the scoping of the project. Initially, the thesis was started to review the process considering the entire organization and later when it was realized to be practically difficult in the designated time frame, the scope has been narrowed to be more specific. Most of the time has been spent in data collection and analysis of the data to achieve the answers for the research questions. The choice of research questions has also been crucial for designing the research study and data collection. As mention by Yin (2014), the author has spent time on designing the research questions because of the fact that the study should be conducted on the basis of the research questions. Further, a methodological approach such as reviewing the literature initially and then choosing the kind of data required, followed by appropriate data collection techniques has helped in reaching the conclusions within the stipulate period.

The choice of qualitative data for the case study research was also vital and this has been realized earlier in the study. Initially, the idea was to consider the quantitative data and qualitative data for conducting the study. When the initial literature review was conducted, the limitations with the availability of quantitative data in a public-sector setting were grasped. As mentioned multiple times in this report, the quantitative data has not been of much use but provided strength to the theories related to this topic. When the data collection began it was evident that there are challenges to use the available data. This led to the choice of the tools to be used for the case study. Yin (2014), mentioned that case study research approaches are always iterative, and this has been the scenario for this case study.

For this study, the author chose to conduct semi-structured interviews in order to gain better insights of the process that is being studied. The choice of having semi-structured interviews is that, having structured interviews might lead to risks where the author might lose chance to ask about more information (Bryman & Bell, 2016). On the other hand, the open minded unstructured interviews have the risk of losing focus on the topic and deviate to many other discussions (Bryman & Bell, 2016). So, considering these points, semi-structured interviews have been the perfect choice for the qualitative data collection.

Furthermore, recording the semi-structured interviews as suggested by Merriam (2009) has been very helpful as this study has been carried out by only one author, who has been collecting and evaluating the data simultaneously. By listening to the information multiple times, it helped in identifying very keen factors which could have been missed otherwise. However, a disadvantage has been encountered which is dedicating high amount of time to analyze this data as most of it was audio recorded and not present either drafted or transcribed word by word, though key points have been taken down as notes. All in all, the caution given by Yin (2014) regarding the reliability of the qualitative data has been considered and the results have been discussed with the supervisors of the author. This further strengthened the validity of the study.
As mentioned by Voss, et al (2002), the strengths in the case study research approach were important for this research. An in-depth knowledge and strong analysis were possible for this case study with the multiple sources of evidence. The customer request handling process has been studied in depth and the knowledge about the benefits of using the selected tools has been gained. This further led to the development of a process improvement strategy for the UEO. On the other hand, Yin (2014), mentioned that the case study approaches have criticism for being biased and too case specific where the results could not be generalized. This is evident in the case because study, as it has been limited to a single organization. However, the multiple sources of evidence and the literature review has been used to overcome this limitation (Yin, 2014). As suggested by (Yin 2014), discussing the results and analysis by matching them with theoretical frame of reference, helped the author to generalize the case study to the public-sector organizations. Further the sources of data collection were complex as mentioned by Yin (2014) about qualitative case study, because each data was from different sources as well as individuals and provided various inputs which had to reviewed multiple times to come to a conclusion. Although there is complexity with data analysis, as mentioned earlier, this multiple data sources helped in evaluating the reliability and validity of the data leading to triangulation.
7 Conclusion

This chapter presents the author’s reflection on the research work of this thesis. From the overall review on the previous chapters, the research questions presented in the chapter 1, will be answered with which this study concludes. Finally, the author’s suggestions for the possible future work in this area will also be presented.

7.1 Conclusions of the study

The thesis began with the purpose of suggesting a process improvement strategy for increased customer satisfaction for municipal organizations. Based on the results and analysis at the case study organization – MoS department of Linköping municipality and relating it to the theoretical frame of reference conclusions have been made and the answers to the research questions have been found.

The major conclusion from this study is that the quality management methodologies such as Six Sigma and Lean are very much adaptable for the public sector. Although, the study did not include about reaching either a complete Six Sigma level or Lean management level or a combination of both, they can be started by introducing some of the tools of these methodologies. Certain difficulties have been identified to implement these methodologies which are mainly due to the management and working culture that exists in the typical hierarchical organizational structures of the public sectors. Further, problems with lack of knowledge with these methodologies is common in most of the cases. Therefore, these methodologies should be customized according to the environment in which they will be implemented.

Apart from the challenges, with process orientation and focus on the customers it is possible to achieve process improvements in public sector like in any other sectors. The customer focus is the key to achieve improvements in any process and making changes without the perspective of the customers will be of no worth. Additionally, in accordance with the previous literature study it can be concluded that, the concept of process improvements irrespective of any sector should be a part of the management culture. The improvements can only be possible when there are continuous efforts from management as well as employees.

Furthermore, the complexity with the customer requirements as they vary widely from customer to customer is another important observation in this study. Although, the organizations in the public sector have high customer focus and work towards achieving the customer satisfaction, it can be difficult to satisfy all of them. The reasons as discussed in the earlier chapters such as wide range of variation in their requirements and the process mandates to laws and regulations. These are the areas that are to be considered while planning for process improvements in the public sector.
7.1.1 Answers to Research Questions

The case study has been carried out on the basis of three research questions that were mentioned in the chapter 1. The conclusions on this study have been drawn from answering the research questions, where the answers have been identified from various stages of the research. The answers for them are as followed:

RQ1: How to map the customer request handling process at the case study organization?

The first research question can be answered from the methodology followed to make the process mapping in the case study. The mapping of the customer request handling process at the case study organization can be done by first listening to the customers voice and mapping the process from their perspective. When the processes are mapped without considering the customers and assuming them from the internal perspective, the results will lead to dissatisfied or unsatisfied customers. Therefore, while mapping the process, it is important to understand the customer needs and requirements, then translate them into the process steps.

The next interesting observation made for mapping the customer request handling process is that, involving the people working within process provides clearer mapping ideas. This means involving employees related to the process along with the customers perspective is concluded to be important while mapping the process. The most feasible way is to interview the people and get the insights of the working process. Further, the process maps should be revised timely in order to highlight the changes, from which the improvement possibilities can be identified.

As this particular customer request handling process begins with the customer requirement and ends with the customer satisfaction, it is important while mapping the process that every step should be fulfilling the customer requirements. Thus, it can be concluded that the process steps should always be focusing to lead to the final customer satisfaction point.

RQ2: How is the customer orientation at the case study organization? To what extent does the current process meet the customer requirements and needs?

The feedback from the employee interviews provided the inputs to answer this research question. The MoS organization as a whole has very much focus on their customers and are always working towards improving their processes according to the customer needs. The definition of “customer” varies from office to office and similar is the customer orientation. However, during the research it has been observed that the developments are considered from the internal perspective rather than from the customer perspective.

From the customer feedback methods, it can be seen that they consider methods to listen to their customers, however the analysis are limited to setting up the goals and targets. The first part of the question can be answered by concluding that the customer orientation at MoS is a mixed approach because the organization plans for several improvements without a proper communication with the customers. The drivers for the customer orientation are limited, because of the lack of the financial exchanges for the service and lack of competitors.
Further, the extent to which they meet the customer requirements and needs cannot be clearly stated as the process is still organization (supplier) driven rather than being customer driven. The customer expectations are met when they are providing prompt responses to customer requests irrespective of the mode of communication. Further, a lot of emphasis on implementing new IT systems and sub-services as solutions to meet the customer requirements and needs. But, from the analysis of the customer interviews it can be concluded that the current process can meet the customer expectations only when they provide responses to customer requests, even though the answer/decision does not necessarily be the customers favor.

Finally, it can be concluded that instead of focusing on new services and IT systems, frequent communication with the customers and gathering continuous feedback from them will lead to better customer focus which eventually results in providing services that meet the customer requirements and needs.

**RQ3: How could the tools contribute to process improvements in public-sector organizations?**

The tools selected for process improvements at the case study organization are Process Mapping, Voice of the Customer, Critical to Quality, Cause & Effect Analysis, 5 Why’s, Benchmarking and Standardization. These tools have been used for different purposes and in a particular order to identify the improvement areas and suggestions for betterments. From the overall analysis, firstly it can be concluded that these tools can very well contribute to the process improvements when applied consciously in any public-sector organizations. The application of tools can be used as starting point to induce the ideology of Lean and Six Sigma methodologies slowly into the public sector. Further, these tools do not require specialists with analytical skills and can be used by the employees with little caution, especially in the situations where the numerical data availability is limited or difficult to gather.

The major conclusion from using the tools is that it is necessary to apply them in a strategic order in order to gain the benefits and increase customer satisfaction (as in figure 17). First, the process mapping should be made for the process that is chosen to be improved. Simultaneously, the VOC can be analyzed and arranged according to the Kano Model. After this, the CTQ tree can be set by using all the customer feedback and the process status from the process mapping. Then, the problems and gaps that have been identified by using the first three tools can be listed to make a root cause analysis. This root cause analysis can be made by using the Cause & Effect Analysis and the 5 Why’s. Once, the root causes are verified and got confirmed as true, the areas that are to be improved can be clearly understood. Then the improvement suggestions can be made by using the Benchmarking and Standardization tools. When the tools are used strategically, the public-sector organizations can benefit by implying them for the process improvements. By following the right order, the strategic approach can lead to reach the customer expectations resulting in increased customer satisfaction.
7.2 Contributions & Future Work

The research at the MoS department of Linköping Municipality, contributed to the development of a process improvement strategy for the public-sector organizations. The strategy is by using the tools in a particular order as mentioned in the previous chapters. Although, this strategy has been applied to a single case study, the discussion with respect to the previous research and conclusion on the results led to the generalizability of the study. Thus, this can be applicable to other public-sector organizations such as other offices in MoS, other municipalities in general because of the commonalities in the organizational and cultural aspects found in these organizations. All these organizations have similar challenges with customers, processes and are supplier driven. This strategy can be implemented either by using all the tools in the order of the three steps or by using one tool from each step. Further, this study contributes to implementation of the quality management methodologies especially in the municipal organizations which currently has limited research work.

The results from this study can be used as the foundation for the future researches on process improvements. While considering the entire public sector, there might be some variations for using this strategy with respect to the type of organization. Therefore, this could be considered for future studies about applying the strategy on different public sectors and find if there are variations or provides same results.

Future research on applying the strategy to other public-sector organizations such as Police administration, Defense Administrations, Educational institutions and Health Care might lead to other interesting conclusions. Further, the choice of the tools for the developing the strategy played a major role and it could be interesting to use other tools which might lead to some more conclusions in addition to these findings. Lean and Six Sigma methodologies are packed with many tools and selecting others such as statistical tools, Value Stream Mapping, Kaizen etc. could be interesting for future research.
8 References


Appendix – 1

All the interviews are Semi-structured interviews, which lasted for about 40-60 mins of time. The questions listed are the example questions which varied slightly in each interview. But more or less the questionnaire remained same, instead a few follow up questions have been added based on the responses from the respondent.

Interview Guide – 1

Interview Questions to Head of offices

1. Can you describe your role in the organization?

2. Can you describe briefly about your office?

3. How do you perceive service quality?

4. In what ways do the customers approach you?

5. What is the process of handling customer requests in your office?

6. Do you use any different internal system (ticketing application) for this process?

7. How do you measure customer satisfaction?

8. How do you handle dissatisfied customers?

9. What kind of problems do you see in your current process?

10. What do you do if the process lead times are not met?

11. Do you have a strategy specific to your office for this process?

12. What do you think are the important performance indicators in the process for customer satisfaction?

13. Would you like to add any additional comments?
Interview Guide – 2

Interview Questions to Case Officers in UEO

14. Can you describe your role in the organization?

15. Who are your customers?

16. In what ways do the customers approach you?

17. What system do you use for handling customers’ requests?

18. How long does it take to solve one customer request?

19. Do you respond immediately, when you receive a customer request?

20. How many issues do you handle usually per day?

21. How many hours in a day do you dedicate for working on these customer requests?

22. Do you have a target of how many issues to handle?

23. How do you keep a track of the issues?

24. How is the usual work flow typically in a regular day?

25. What problems do you face while handling these customer requests?

26. Can you describe the process in your words?

27. How convenient are you with this current process?

28. Do you see any problems within the process?

29. Do you follow any kind of Quality Management approaches such as Lean, Six Sigma, or something else to ensure the quality of service in the process?

30. What could be improved in the current process? Can you share any ideas or strategies for improvements?

31. Would you like to add any additional comments?
Interview Guide – 3

Telephone Interview with Customers/Citizens

The telephone interviews with the customers has been designed to be short and direct questions so that the customers in order to make it easy for them to answer. They lasted for about 5-15 mins with each customer. Some customers preferred to answer via email and the same questionnaire has been sent to them via e-mail. The following protocol and set of questions have been used for the interview.

Hej xxx,


Hi xxx,

My name is Deepika and I call from the Urban Development administration department of Linköping Municipality. I am studying at the university and working on my Master Thesis about customer satisfaction with municipal services. I have been in contact with customer support and we have chosen you to find out what our customers like about the services to our citizens. Few weeks back you had a question regarding xxx. My questions are related to your experience about that service. Do you have time, as I would like to ask you 5 questions about it?

1. Var det lätt att hitta information om var man vänder sig för att får kontakt kring ditt ärende?
   *Was it easy to find the information about how to contact the municipality regarding the service you needed?*

2. Fick du service direkt kring din fråga?
   *Have you received a direct help regarding your service request/question?*
   
   a. Ja – Direkt
      *If Yes – Directly/Quickly*
   
   b. Nej – Hur snabbt fick du någon återkoppling?
      *If No – How long did it take to get a response for your query?*

3. Är du nöjd med servicen
   *Are you satisfied with the service?*
   
   a. Ja – Kan du berätta lite gran om vad tyckte du?
      *If Yes – Could you elaborate what did you like about the service?*
   
   b. Nej – Vad tycker du behöver förändras?
      *If No – What do you think should be changed for better services?*
4. Hur upplevde du hanteringen av ditt ärende som helhet?
   *How was your overall experience with your service request handling process?*

5. Har du övriga funderingar
   *Would you like to add additional comments?*

**Note:** From the customers’ answers, the must be, more is better, and delighter’s have been identified from their responses and categorized accordingly.
Appendix - 2

General Customer Requests Handling Process Map

Source: MoS, 2017
General Customer Request Handling Process Map translated to English

Source: MoS, 2017
# Appendix 3

Citizen Survey Questionnaire & Results

## Citizen Survey

Page 1

### Vad tycker du om stadsmiljön m.m. i Linköpings kommun?

<table>
<thead>
<tr>
<th>Trafik, gatustandard, gatuskössel, stadsmiljö och tillgänglighet</th>
<th>Medveten</th>
<th>Godkänd</th>
<th>Volymerade</th>
<th>Godkända</th>
<th>Medveten</th>
<th>Val ej</th>
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</thead>
<tbody>
<tr>
<td>1. Jag tycker tillgängligheten till daglig service (t.ex. butik med livsmedel och andra dagligvaror, bank- och poststatioen, trinor, café/restaurang) är...</td>
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<td>2. Jag tycker att mina möjligheter att arbetena nås är...</td>
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<td>3. Jag tycker att kollektivtrafikens snabbhet (turlag, linje svarstida, påställning och tider mellan enligt busstidtabell) i Linköpings kommun är...</td>
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<td>4. Jag tycker att kollektivtrafikens belägenhet och träfvel i Linköpings kommun är...</td>
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<td>5. Jag tycker att standarden (jämhet, grovar och spår) på de stora gatorna i kommunen är...</td>
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<td>6. Jag tycker att standarden (jämhet, grovar och spår) på gatorn där jag bor är...</td>
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<td>7. Jag tycker att standarden (jämhet, grovar och spår) på gång- och cykelvägar är...</td>
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<td>8. Jag tycker att snörning och halkbekämpning på de större vägarna och gatorna i kommunen sköts...</td>
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<td>9. Jag tycker att snörning och halkbekämpning på gatan eller vägen där jag bor sköts...</td>
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<td>10. Jag tycker att snörning och halkbekämpning på cykelvägar sköts...</td>
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<td>11. Jag tycker att renhållningen på gator och vägar i Linköpings centrum fungerar...</td>
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<td>12. Jag tycker att renhållningen på gator och vägar utanför Linköpings centrum fungerar...</td>
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<tr>
<td>13. Jag upplever att arkitekturen och kvaliteten på ny- och ombyggnationen i stadsmiljöerna (gator, toig, byggnader och anläggningar) är...</td>
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<td>14. Jag tycker att tillgängligheten till Linköpings innerstad är...</td>
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<td>15. Jag tycker att attraktiviteten i Linköpings innerstad är...</td>
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<td>16. Jag tycker att framkommeligheten för personer med nedsatt rörelseformåga i offentliga miljöer (gator, toig, parker) i Linköpings kommun är...</td>
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### Jämställdhet

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<tr>
<th>Jämställdhet</th>
<th>Medveten</th>
<th>Godkänd</th>
<th>Volymerade</th>
<th>Godkända</th>
<th>Medveten</th>
<th>Val ej</th>
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<tr>
<td>17. Hur upplever du att kommunen talar på ditt hörn och talar med kvinnor och män i lika hög grad?</td>
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<td>18. Hur upplever du som kvinna om att kommunen bedömer dig att lycka till om, medarbetare eller data i stads- och trafikutvecklingen?</td>
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*Source: MoS, 2017*
Page 2

### Trygghet

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<tr>
<th></th>
<th>Mycket dagligen</th>
<th>Goda dagligen</th>
<th>Vecko-redd dagligen</th>
<th>Genomgående</th>
<th>Mycket bra</th>
<th>Vet ej</th>
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<tbody>
<tr>
<td>19. Jag tycker att tryggheten kvällar och nätter på gator och torg i Linköpings innerstad är:</td>
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<td>20. Jag tycker att tryggheten kvällar och nätter i parker i Linköpings innerstad är:</td>
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<td>21. Jag tycker att tryggheten utomhus kvällar och nätter i mitt bostadsonröre är:</td>
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### Parker, natur och rekreation

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<th>Vecko-redd dagligen</th>
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<th>Mycket bra</th>
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<tbody>
<tr>
<td>22. Jag tycker att parkerna i Linköpings kommun sköts:</td>
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<tr>
<td>23. Jag tycker att kommunens parker och grönområdets attraktivitet (möjlighet till rekreation, social samvär och rika miljöupplevelser) är:</td>
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<tr>
<td>24. Jag tycker att rekreationsmöjligheterna i den landsorten naturskönhet och i de kommunala naturreservat* är:</td>
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 *) Kärna mosse, Timmerö ekandskap, Ullstälmaskogen, Valasjogen, Vägängsöskogen och Väggeby.

### Kommuninformation, delaktighet och service

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<tbody>
<tr>
<td>25. Jag tycker att kommunens information om Linköpings stads- och landsbygdsutveckling (bebyggelse, gator, trafik, parker, naturvård mm.) är:</td>
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<tr>
<td>26. Jag tycker att möjligheterna att lämna medborgaråsikter, delta i samråd och föra dialog med kommunen om stads- och landsbygdsutveckling är:</td>
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<tr>
<td>27. Har du haft någon kontakt med kommunen (samhällsbyggnadskontor eller miljö- och samhällsbyggnadsförvaltningen) inom de senaste 12 månaderna?</td>
<td>Nej</td>
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<td>Ja</td>
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### Särskilda frågor

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### Bakgrundsfrågor

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<td>Hur ofta går du promenerar du i Linköpings innerstad?</td>
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<tr>
<td>Hur ofta cykla du på cykelvägar i Linköpings kommun?</td>
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</tr>
<tr>
<td>Hur ofta åker du buss i Linköpings kommun?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hur ofta körs du bil i Linköpings kommun?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: MoS, 2017
## Citizen Survey Results

<table>
<thead>
<tr>
<th>Mål för verksamheten</th>
<th>Måluppfyllelse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nämnden och dess verksamheter ska stärka demokratin och inflytandet genom god information, dialog och samverkan med medborgarna, den ideobarna sektorn och andra intressenter.</td>
<td>Målet är uppnått.</td>
</tr>
</tbody>
</table>

*Source: MoS, 2017*
Har du haft någon kontakt med kommunen (samhällsbyggnadsnämnden eller miljö- och samhällsbyggnadsförvaltningen) i något ärende som gällde gator/vägar, trafik eller parker de senaste 12 månaderna?

<table>
<thead>
<tr>
<th></th>
<th>Nej</th>
<th>Ja, 1-2 gånger</th>
<th>Ja, 3 eller fler gånger</th>
<th>Vet ej</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procent</td>
<td>81%</td>
<td>12%</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: MoS, 2017

Have you had contact with MoS (samhällsbyggnadsnämnden eller miljö- och samhällsbyggnadsförvaltningen) i något ärende som gällde gator/vägar, trafik eller parker de senaste 12 månaderna?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes, 1-2 times</th>
<th>Yes, more than 3 times</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procent</td>
<td>81%</td>
<td>12%</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: MoS, 2017
Appendix - 3

Source: MoS, 2017
Source: MoS, 2017