

Lean in Swedish municipalities

A study of Swedish municipalities that are practicing the lean concept.

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Objectives: Lean is a management control concept that has become popular within service producing organizations. This study focuses on municipalities, among service organizations, and aims to investigate the presence of lean in Sweden's municipalities. Through a literature review we will identify different focus areas from the lean literature based on the most common used variables of the concept. With the ground in these variables that are relevant for a service purpose we will examine which variables within these focus areas that the municipalities have adopted and have chosen to practice, and if, to which extent they are practicing them. Finally, the study will examine lean in municipalities from a Public Management Perspective, to see how the employees that practice lean, value the different variables in the aspect of becoming effective and thereby if the concept can contribute to more effective processes in the public sector.

Methodology: We carried out an examination of the municipalities in Sweden. The municipalities were contacted over telephone to find out whether the municipality practiced lean. If so, they were emailed our web survey with questions about the lean concept. Thereafter, the answers were collected, the result was compiled and finally analyzed.

Findings: We got in contact with 242 out of 290 existing municipalities. Out of the 242 contacted municipalities; 64 of them answered that they practiced the lean concept; 36 of them answered our web survey. The municipalities had either implemented lean in the whole municipality or in different departments. The results showed that municipalities have to a high extent adopted the lean concept in a similar way. All respondents answered that they practiced all the variables of lean to same extent, with a few exceptions. The different variables were also practiced to more or less the same extent. The respondents answered that all the different variables had a high importance of becoming more effective and that the lean concept had contributed to more effectiveness where it was practiced.

Originality: This is not the first essay to examine the lean concept in Swedish municipalities. However, the lack of research that focuses on an overall perspective among municipalities inspired us to fill this gap.

Keywords: Lean, New Public Management, Municipality, Service Organization, Sweden.

Paper type: Bachelor thesis, business administration.

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1. Introduction

1.1. Background

The external pressure of becoming more effective, increase the flexibility and raise the quality affects the service organizations and they have to rethink their strategies (Piercy et al., 2009). Within service organizations, studies have shown that there is room for improvements; services that are delivered do not meet the customer demand in terms of quality (Eriksen, Fischer & Mönsted, 2008; Piercy et al., 2009), there is a wide variation in the customer's demand and therefore a need of flexibility (Braun & Kessiakoff, 2005; Piercy et al., 2009) and major production losses occur because resources are focused on editing errors of defective services. Another aspect is the employees' lack of engagement, which can have a negative impact on the delivery of the service. (Eriksen et al., 2008)

Municipalities, known as a service organization, are facing the same challenges. Society has become accustomed to the public sector's limited and insufficient resources. The citizens have high expectations on high quality services meanwhile; they demand reduced taxes and fees. This has forced the public sector to reflect on how they can become more efficient and face tougher competition. (Rombach, 1997) New techniques and methods to enable a more leanness work have therefore arisen in the public sector (Abdi, Shavarini & Hoseini, 2006).

In the 1980s the New Public Management (NPM) emerged, a management philosophy used by the governance. It can be explained in a broad and complex term of how the governance used the philosophy to modernize the public sector, through the implementation of private business management accounting theories and methods. (Lapsley, Brown, Jackson, Oldfield & Pong, 2003; Christensen & Laegreid, 2007; Heyer, 2010) The purpose was to give the public sector a more market-orientated management and also to create a performance management system, which aimed to improve the efficiency and effectiveness. Balanced Scorecard, Key Performance Indicators, and Activity Based Costing among others were methods used. (Gruening, 2001; Heyer, 2010)

Lean, with its heritage from *Toyota Production System (TPS)*, a manufacturing management concept, is one among many management accounting concepts that have been developed during the last decades. (Liker & Morgan, 2006; Womack, Jones & Roos, 1991) TPS became popular with the success of Toyota in the 80's, which made the concept attractive and other organizations were inspired by the concept (Liker et al. 2006; Womack et al, Jones & Roos, 1991). The concept evolved within the manufacturing industry (Atkinson, 2004; Knuf, 2000) and in the 90's the concept became known as *Lean Production*, which is an American interpretation of *TPS* (Atkinson, 2004; Hines, Holweg & Rich 2004).

Lean is a way of working and thinking whose purpose is to increase the efficiency and quality in organizations through the reduction of waste in processes that largely takes place on an operational level (Worley & Dool, 2006). Lean is about doing more with less and give the customer exactly what it wants, eliminate waste in the value stream, strive for perfection

(Womack & Jones, 2003) and see the organization as a whole, with all its individual elements; people, processes and technology, as an integrated system (Liker et al., 2006; Seddon, 2008; Womack et al., 2003).

When lean was implemented within organizations and research proved that it could have a significant impact on organizations' wealth, health and competitiveness, (Atkinson, 2004; Knuf, 2000) the interest of lean spread beyond the manufacturing industry. Which lead to debates whether; the lean concept was applicable on services (Seddonand & O'Donovan, 2010). In the mid 90's, researches pointed out the benefits of practicing lean within service producing organizations (Avery, 2003; Hines et al., 2004; Piercy & Rich, 2009) and with a rapid spread, the concept gained popularity beyond the manufacturing industry and became practiced within the service industry among others (Avery, 2003; Hines et al., 2004; Knuf, 2000; Liker et al., 2006).

1.2. Problem Discussion

The introduction of private control instruments has led to the development of the public sector (Krafcik, 1988; Rombach, 1997). Municipalities have increasingly become more market-like and similar to privately operated organizations (Rombach, 1997). Several government organizations have adopted lean to enable a customer-oriented work to configure resources and processes (Radnor & Walley, 2008). Denmark for instance, has for many years been inspired by lean in the provision of services and administration (Larsson, 2008). In recent years, the concept has been implemented in the public sector (Larsson, 2008; Stentoft Arlbjörn, Freytag & de Haas, 2010) and approximately 70 % of all Danish municipalities practice lean today (Larsson, 2008).

The appropriateness of NPM utilized by the public sector has caused a rigorous debate, especially in regard to the public sector's adoption of business specific principles from the private sector. This contention is based on the view that the public sector is vastly different from the private sector and as a result, the adoption of private sector attitudes and theories are therefore inappropriate. It is believed that the difference between the private sector operating environment, their business goals and objectives, and their structures and values are so different to those of the public sector. This makes it impossible to implement such managerial techniques successfully within the public sector and that the level of change required to implement the reform would be too complex. (Butterfield, Edwards, & Woodall, 2004)

Studies of the diffusion and implementation of lean as a management accounting concept in municipalities in Sweden have not been made to a large extent. Though some studies have been made, these focus on a smaller number of municipalities (Brännmark, Halvarsson & Lindskog, 2011; Crnkic, 2010) and others on the success factors behind the implementing of lean in the public sector (Ögren & Rüte, 2009).

However, the diffusion and adoption of the concept in different contexts have led to confusions of what lean is and what it is not (Hines et al., 2004). The confusion is based on

the conceptual and operational explanations of the concept and also the gap between them (Shah et al., 2007). Various studies have been made with the aim to clarify the confusion of the concept and explain the different parts of the concept (Atkinson, 2004; Hines et al., 2004; Liker et al., 2006; Wood, 2004). Studies of how the lean concept can be applied within service organizations have also been made, with the aim to explain and create a better understanding of the concept and its objectives (Abdi et al., 2006; Malyeff, 2006)

1.3. Objectives

This study focuses on municipalities, among service organizations, and aims to investigate the presence of lean in Sweden's municipalities. Since lean can be identified as concept with its origins from the private sector with the aim to create efficiency and effectiveness we have chosen to approach lean from a New Public Management perspective. Through a literature review we will identify different focus areas from the lean literature based on the most common used variables of the concept. With the ground in these variables that are relevant for a service purpose we will examine which variables within these focus areas that the municipalities have adopted and have chosen to practice, and if, to which extent they are practicing them. Finally, the study will examine lean in municipalities from a Public Management Perspective, to see how the employees that practice lean, value the different variables in the aspect of becoming effective and thereby if the concept can contribute to more effective processes in the public sector.

1.4. Disposition

The construct of this study is organized as follows. The second chapter gives a theoretical frame and reference of New Public Management, which is followed by a theoretical explanation of the lean concept divided into eight different focus areas based on a literature review. In the third chapter the research method for our empirical data is presented and discussed. The fourth chapter is where the results are presented and analyzed. In the last and fifth chapter, our conclusions are made and our suggestion for further research is presented

2. Theoretical Framework

2.1. New Public Management

During the 70's and early 80's a change was made in the way of controlling the public sector and its activities. It started in Great Britain and was then spread to the rest of the world. The new way of controlling the public sector has retrospectively come to be called New Public Management (NPM) by researchers. (Gruening, 2001) NPM is mostly about an effort by its perpetrators to develop and improve the public sector, often at the heads of state and governmental level. The reason is to make it more competitive and in a larger part to respond to the public needs (Groot and Budding, 2008). The NPM philosophy has been described as a move towards a governance approach that places emphasis on transparency, performance management and accountability of public sector employees and managers. The philosophy has been identified as "one of the most striking international trends in public administration" that is capable of re-inventing government (Leishman et al., 1996, p. 26). The NPM is in the literature described to increase the market orientation, decentralization, a changed leadership that provides a strategic thinking and the introduction of concept that focuses on quality and organizational leadership (Gruening, 2001).

The introduction of NPM has largely changed the public sector, however the change has been very different in different countries. In some countries, the development in the public sector has been the result of several on-going processes and local initiatives, which subsequently has been labelled NPM, while other countries clearly have been influenced by the NPM from the outside world (Christensen & Laegreid, 2007). In Sweden the NPM primarily had an impact in a decentralized level, particularly in the municipal sphere. It is also noted that Sweden is one of the countries where NPM largely has been implemented. NPM had its peak in the 90's and there are scientist who believes that the government is moving towards a post-NPM-state. (Christensen & Laegreid, 2007) There are also those scientist who question the ability of NPM to survive and which effects it could provide the public sector in the future (Groot and Budding, 2008; Lasley, 2008)

2.2. The Lean Concept

2.2.1. Understanding the Lean Concept

To create an understanding and to define the lean concept it is important to understand the fundamentals, the historical perspective and how the concept has evolved over time (Shah et al., 2007). The fundament of the lean concept, established by Womack and Jones (2003), are the five principles; (1) Precisely specify *value* by specific product, (2) identify the *value stream* for each product, (3) make *value flow* without interruptions, (4) let the customer *pull* value from the producer, and (5) pursue *perfection*" (Womack & Jones, p.10, 2003). The different variables of the lean concept are needed to succeed with the optimizing of system and reach

optimal effectiveness (Bicheno, 2008; Larsson, 2008). Practice the concept is more about develop a strong company culture and a way of thinking than practicing a number of tools (Larsson, 2008). Organizations must adapt both a way of thinking and a way of working (Larsson, 2008; Liker et al., 2006; Womack et al., 2003)

The lean concept has its origin from the manufacturing industry it is often described from a manufacturing perspective, which can lead to confusion when implementing the practices into service organizations. Academics and users have developed different views of lean and the concept is often described from two perspectives: either a more philosophic or a more practical one. (Hines et al., 2004) The confusion is based on the conceptual and operational explanations of the concept and also the gap between them (Shah et al., 2007). Lean has become a concept that is applicable in a variety of contexts which has led to the development of different terminologies, such as lean administration (Larsson, 2008), lean service (Seddon, 2008) and lean healthcare (Warnin & Bishop, 2010) with the aim to be more suitable for different contexts (Shah et al., 2007). Various studies have been made with the aim to clarify the confusion of the concept and explain the different parts of the concept (Atkinson, 2004; Hines et al., 2004; Liker et al., 2006; Wood, 2004). Studies of how the lean concept can be applied within service organizations have also been made, with the aim to explain and create a better understanding of the concept and its objectives (Abdi et al., 2006; Malyeff, 2006)

To follow through the study it is essential to understand how organizations adopt popular concepts. When introducing a concept into a new context it is often adopted and adjusted for its intended purpose (Rövik, 1988). To adopt a concept mean that you take a concept from the original context; you then reproduce an imitative idea and put it into practice in the new context with a few or no changes or that you either add or subtract some elements to a conceptual representation. (Rövik, 2007) Sometimes a fundamental or radical change is made in both form and content, in a way that the external idea is perceived as a local innovation (Rövik, 2007). Occasionally organizations believe that they have translated or adopted the concept identically, but in reality they have accidentally translated the concept in a different manner. This depends on various factors that make the organization unable to copy the concept identically. (Rövik, 1988) An identified practice can rarely or never transfer, at least not completely in their physical form from one organization to another (Lillrank, 1995). Lean is no exception, it has been applied and is constantly adapted into new contexts. However, since the concept is described in different it cause confusion. (Abdi et al., 2006; Atkinson, 2004; Larsson, 2008; Liker, 2004; Piercy et al., 2009; Swank, 2003; Wood, 2004).

2.2.2. A Literature Review

To define the most frequently used variables in the literature and to be able to compile our different focus areas, a research of what the lean concept is, have been done. Literature of lean has been read to create an understanding for the lean concept. The book of Womack, Jones and Roos: "The machine that changed the world" (1991) highlighted Toyota's way of working for the western society. They were among the first to give the lean concept an English

explanation in the 90s (Hines et al., 2004). This was complemented with other literature and science articles, such as; Womack and Jones (1994; 2003); Liker (2004); Liker and Morgan (2006). This literature was mainly written from a manufacturing perspective, but indicated that it could be applicable in other industries as well. The more fundamental parts of the concept were explained in this literature, which gave a general description of the concept.

For a better understanding of the concept the research was complemented with more science articles. The majority of these articles aimed to clarify and explain the lean concept, such as Wood (2004), Atkinson (2004), Hines, Holweg and Rich (2004) and Shah and Ward (2007). We also read other literature that explained how the lean concept could be applicable and implemented within the service industry and different service organizations, as George (2003), Abdi, Shavarini and Hoseini (2006), Maleyeff (2006), Bicheno, Anhede and Hillberg (2009) and Piercy and Rich (2009). Finally, some lean manuals and handbooks that gave a more practical explanation with more concrete facts of how to practice lean in service organizations; these were Braun and Kessiakoff (2005), Bicheno (2008), Eriksen, Fischer and Mönsted (2008) Seddon (2008, 2010) and Larsson (2008). The practical perspective gave a set of management practices and techniques that directly could be observed (Shah et al., 2007). The lean literature is to a high extent referenced to the book of Womack, Jones and Roos (1991) and Womack and Jones (2003).

2.2.3. Definition of Construct

The research led to a creation of an understanding and knowledge of the lean concept. Which resulted in eight different focus areas that contain variables that are frequently reproduced in different literature and are a central part in this thesis. The focus areas are based on different variables, both in lean thinking and working. Much of the lean literature is referred to the Womack, Jones and Roos (1991) and Womack and Jones (2003), therefore our theoretical framework is also, to a high extent, based on their literature. Following in this chapter, an explanation of each focus area is given. The focus areas are also the base for the investigation of the municipalities in Sweden. However, due to the fact, that the concept is more of a philosophy than a toolbox, makes it hard to concretize the whole concept. Additionally, as the concept in many ways are seen as philosophy with quite abstract variables, it was not possible for us to cover the whole concept in our study. The eight different focus areas that was compiled are; customers, processes and system thinking, value-adding and non value-adding activities, visualization, standardization and demand driven production, leaders, employees and continuous improvements.

2.2.4. Eight Focus Areas

2.2.4.1. Customers

Lean literature discusses the importance to identify what value is for the customer and design the service from a customer perspective. The objective of a service is to solve the customer problem. (Womack et al., 2003) The customer should be in focus in all decisions that are

made, both on a strategic and an operative level (Bicheno et al., 2009; George, 2003; Hines et al., 2004). To be able to maximize the customer's value it is important to have an understanding for two things: who the customer is and what it demands and needs. It is therefore essential to investigate and chart the type of customer that exists, both externally and internally (Eriksen et al., 2008). Customers, owners, employees (Seddon, 2008; Womack et al., 2003) and the society can all be identified as a customer (Braun et al., 2005).

When the customer is identified and mapped out the identification of customer value can be performed. This value should then be created for all different customers. The customer value should be described in detail and if possible in terms of needs, quality, quantity and price. The services should then be designed from a customer value perspective. (Seddon, 2010; Womack et al., 2003)

Sometimes it can be complicated to design the service because of the customer's different preferences. Aspects, such as, quality and time can be difficult to define and they can also be quite diversified. (Seddon, 2010) The service should also be delivered in the right time and place (Womack et al., 2003). After the identification of the customer and its demands and needs it is essential to continuously make examinations and evaluations since these aspects tend to vary over time. Continuously examinations can therefore prevent the production of non-demanded services and eliminate waste. (Eriksen et al., 2008; Larsson, 2008)

2.2.4.2. Processes and system thinking

To see the different activities within the organization as a system is a crucial part of the lean way of thinking. The idea is to see the whole organization, the entire set of activities as one great system. (Seddon, 2010; Womack et al., 2003) It is also fundamental to understand how all the different parts are linked together and how they influence the customer value. Further, to understand how different activities are required to produce specific services (Womack et al., 2003). Because no matter how good an employee's work is done it cannot be compensated if the customer is not satisfied with the delivery of the service (Eriksen et al., 2008).

The great system contains of minor systems that are directly or indirectly related to each other. The activities together with the employees are important parts of the system and it is the people who provide the system with intelligence and energy (Liker et al., 2006, Womack et al., 2003). The system is sometimes also related to other systems outside the organization (Seddon, 2010).

It is not always as easy to identify processes within a service organization as within a manufacturing organization. A manufacturing organization often has a material input and end up with a complete product as output (Larsson, 2008). However, to understand the customers and to organize the operations and activities from their perspective are essential. Through the understanding of the tasks characteristics and functions there is a possibility to coordinate the tasks in an effective way (Womack et al., 2003), something that is decisive for the ability to meet the customer's need and to become more effective (Eriksen et al., 2008). In order to

realize this, the system should first be defined on an overall level. Thereafter, be subdivided into main and supporting processes. Main processes are the processes that deliver value to the customer. Supporting processes are the ones that support main processes and are necessary for the whole system to be maintained. (Larsson, 2008; Liker, 2004; Womack et al., 2003)

2.2.4.3. Value-adding and non value-adding activities

The purpose of visual control and the visualization of metrics and processes are to foster an understanding. The visualization of processes and metrics is a central part of the lean concept. The purpose is to give a holistic view of the organization, to simplify the processes for the employees and to establish a transparency within the organization. (Womack et al., 2003) The visualization in the organization should focus on two things: the clarification of transparent and logical processes and the visibility of metrics and results (Eriksen et al., 2008). An active work with visualization of the activities facilitates the process of finding problems. It helps the problem solving and knowing of where to intervene. (Eriksen et al., 2008; Womack et al., 2003) Service processes, different flows and transaction volumes should be visible, both input and output should be clarified and also the sub processes (Womack et al., 2003). The visualization should preferably be done on boards and with pictures. The pictures should be pedagogical and easy to understand. (Larsson, 2008)

Lean is based on fostering a human- and performance-oriented culture and not a result-oriented culture (Larsson, 2008). The visualization of metrics and results are not about showing the results, instead measurement is the base for an objective approach (Eriksen et al., 2008). Measurements should be done with the aim to develop and improve existing activities (Seddon, 2010; Womack et al., 2003) and to provide help to eliminate defect services (Eriksen et al., 2008). The results should be updated and reviewed regularly (Larsson, 2008). The visualization of metrics and results gives the ability to make systematic and continuous improvements (Seddon, 2010). Through an active work with measurement, a transformation into collaborative learning can be made (Seddon, 2010).

2.2.4.4. Visualization

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2.2.4.5. Standardization and demand driven production system

Without standards it is difficult to control and optimize the processes within the organization (Womack et al., 2003). However, standardization of the services is something that is difficult to implement (Eriksen et al., 2008) and it is hard to understand the relation between standardization and flexibility (Maleyeff, 2006). This is the paradox of lean: how to standardize the activities to a high extent without sacrificing the flexibility.

There is a need of flexibility because there is a great variability in the customer demand (Seddon, 2008; Womack et al., 2003). The consumer has a possibility to interfere in the production of the service, since the service often is consumed in the instant it is produced. This could affect how the customer perceives the service (Larsson, 2008; Seddon, 2010). There is also a higher pressure on the awareness and variability when producing a service (Eriksen et al., 2008). The lean solution to the problem of variation is to give the employees more responsibility. Through a greater responsibility they can make the necessary decisions that are needed to increase flexibility and perform different types of services, depending on what the customer's need is in that specific moment. (Seddon, 2008; Womack et al., 2003)

The production of services should be dependent on the customer's demand for the service. The service should be "pulled", in other words demanded, from the customer outside the organization. The reason for this is to avoid overproduction. (Seddon, 2010; Womack et al., 2003)

The service should be produced when the next stage of the supply chain is in need or, if the customer demands the service. The processing of a service may not commence before assured that the downstream activity is ready to receive it. (Braun et al., 2005) However, demand variability is a variation, which is not primarily required to be eliminated, rather forecasted (Braun et al., 2005; Womack et al., 2003). Both external variations, such as customer demand, and internal variations, such as preparations, should be covered (George, 2003). All customers should be treated the same and similar situations should be prepared as similar as possible (Seddon, 2010). The customer value should be created without any delays, disruptions or quality shortcomings (Womack et al., 2003).

2.2.4.6. *Leaders*

In a lean culture is not about being a chief, it is about being a leader (Seddon, 2010). The leaders are expected to work with the lean culture and to strive for a vision of a perfect process (Eriksen et al., 2008) moreover to think in terms of the value stream (Womack et al., 1994). The leaders should also create commitment and show a genuine interest for lean. Since, it is their vision that is spread downward in the organization (Braun et al., 2005; Seddon, 2010).

The leaders should take part in the processes and gather facts. They should not sit inside their offices and use others opinions, instead they need to take action in the daily work. (Liker et al., 2006; Womack et al., 2003) To achieve this the leaders need to visit the actual workplace, where it all happens and examine the processes and collect data. They have a responsibility to know the exact status of the processes within the organization. (Liker et al., 2006) More to, they should question the daily work to figure out why things are done in a specific way and be able to identify if a process can be improved (Womack et al., 2003).

The leaders are responsible for the implementation of lean and to create the conditions for an implementation (Eriksen et al., 2008). They shall assure that the lean strategies are aligning with the organization's overall strategy (George, 2003). The concept should be implemented through involvement of the employees, and the leader should systematically delegate and clarify the responsibilities in the implementation phase (Eriksen et al., 2008).

The leadership is crucial for the introduction of lean and it requires discipline, skills, knowledge, commitment, work ethics and good communication (Larsson, 2008). The leaders' responsibility is to identify employees with the right skills and gather them into working teams (Womack et al., 2003). The leaders should also ensure that the employees have confidence for each other and themselves. One of the challenges for the leaders is to take on the role as a coach for their employees and give them feedback. (Eriksen et al., 2008)

2.2.4.7. *Emplpyees*

The key to work more efficiently is to take advantage of the employees' inherent powers and creativity in a systematic way (Eriksen et al., 2008). The motive behind this is that every employee can make a contribution to the business given the right conditions. The idea is that the employees have the capacity; they can learn how to think independently, they have the ability to see things form different perspectives and they have an open-minded approach. It is therefore essential to educate employees in the lean concept as well as job training, which focus on their daily work. (Larsson, 2008)

The purpose is to make them feel empowered and engaged (Larsson, 2008). It is also about trying to upgrade and develop their skills; something that puts focus on long-term employment, daily training and educational based evaluation systems (Larsson, 2008; Womack et al., 2003).

The empowerment of the employees, which is created through self-monitoring teams, makes it possible to pick up the best of the employees, which should be done with minimum supervision (Knuf, 2000; Larsson, 2008). The Toyota Production System has showed the importance of using local control, which means that the governance is at the location where the work is done (Seddon, 2010). The employees know the processes best and therefore are the ones who are best suited to come up with suggestions of improvement and their proposals should be taken seriously (Eriksen et al., 2008; Womack et al., 1996).

2.2.4.8. Continuous improvements

The creation of an organizational learning is about developing a culture for the service processes where everyone desire and strive for making improvements and create a positive attitude towards learning (Womack & Jones, 2003). A culture that is permitting problems makes it easier to achieve improvements. Problems, errors and failures should not be seen as something bad, it should be seen as a possibility to identify problem and come up with a solution. Through an open and safe environment, problems can be discussed and identified so the same mistakes can be avoided in the future. This also promotes employees to come up with suggestions for changes and improvements. (Liker et al., 2006; Womack et al., 2003)

Lean focuses on the way of working and not on who is working (Larsson, 2008). The objective of lean is to blame the process and not the individuals to ensure and improve the process so that no errors can occur (Bicheno et al., 2009). The consequences of such an objective are that the employees work better, can increase their productivity and produce a higher profit with a genuine engagement (Braun et al., 2005). A lean organization thinks and acts in a more proactive and result-oriented way (Eriksen et al., 2008). The management of knowledge and continuous organizational learning is something that figure more and more prominently (Liker et al., 2006) and is required from the top management and all levels down (Bicheno et al., 2009). Working with organizational learning is something that can give an organization a competitive advantage (Liker et al., 2006).

3. Reserch Method

3.1. Sample Selection & Choice of Method

Municipalities were identified through the register from the Statistic Central Bureau (SCB), in total, 290 municipalities was identified. Within the municipalities various services activities exists. The different activities can be divided into nine departments: social services, town planning, elderly care, childcare and education, tourism and labour, cultural and leisure, environmental, public transport (Sveriges Kommuner & Landsting, 2011). To cover a larger extent of the municipalities' activities, municipal leadership and administrative processes was added.

A quantitative method in terms of primary data survey, was found best suited for the purpose of the study. Since, the objective was to give a general and descriptive picture of the practice of lean in the municipalities. According to Dahmström (2005), a more general conclusions could not be drawn from just interviewing a few municipalities. Neither the time frame allowed the progress of a qualitative study of a wider group of municipalities.

The use of a primary data survey gives the following advantages: it simplifies the contact with a wide range of people, it gives the respondents the freedom to answer when it suits them and it gives the respondent time to think through their answers. However, this requires a well-composed survey to eliminate the loss of respondents and to avoid problems with misinterpretations of the questions. However, a disadvantage is the reduced control of which person who actually answers the questions. (Dahmström, 2005; Patel & Davidsson, 2003)

This survey is not based on a random sampling method; however, it still gives good overlook of the work within the municipalities based on the answers. Consequently, our results are not representative for th municipalities as a whole or all municipalities in Sweden.

3.2. Email Distribution & Online Questioner

To find respondent with the knowledge of lean, the municipal chief executive, the chief financial officer or the chief staff was contacted by telephone. These three were chosen on the basis that hey have a good overview of the municipality and have contact with all municipal departments, also because decision about the implementation of a new concepts often is taken on a higher level within the organization.

The municipalities was asked whether the municipality practiced lean overall or in any department. If the respondent did not know what lean was, an explanation was given. The respondent had to determine whether lean was practiced or not. If only parts of the concept were practiced or if the work was inspired by lean, the municipality was not counted as perpetrator of lean.

If a municipality worked with lean, the chief executive, the chief financial officer or the chief staff often referred to contact a person who worked with lean on a more operational level in the municipality. That could be a project manager for the lean work-processes in the municipality, an administrative director, or a unit manager, depending on where in the municipality lean was practiced. After further contact with the above positions, they were asked if they could participate in our survey. If lean was practiced in several departments, additional people were asked if they could respond for the different departments. After speaking to the respondents, an email was sent with a link to the web survey. Regarding the personal contact over the phone, the hope was to build up a trust for the survey and to reduce the likelihood of respondents' unwillingness to answer. More to, a letter of introduction was attached to create a positive attitude among the respondents. In the letter, the objectives of the survey, the non-commercial purpose of the survey and how the result would be used, were stated. Contact information were attached, so they had the opportunity to contact us if they had any questions or if anything was unclear. To the non-answering respondents an email was sent to inform them of the importance of their participation.

Google Form was used to distribute the survey. The survey was sent out on 12th May and responses were requested by 17th May, which, also was the closing day of the survey. Of the 290 municipalities, 242 was contacted by phone, 178 answered that they did not practice lean, 64 reported that they practiced lean in some departments of the municipality or overall. The web survey was sent out to 68 respondents within 52 municipalities. In 12 municipalities was it unable to get in touch with a person who could answer the web survey or they were contacted and chosed not to participate in the survey. From 5 municipalities, 2 respondents answered the web survey, leading to 41 responses that represented 36 different municipalities.

The respondents were embedded to answerer the survey on basis of how they practiced lean within their own service department. In the survey they hade to fill in which depratment their answers would represent. The following results in the survey are based on respondents representing the following service departments; municipal leadership and administrative processes: 14 respondents, town planning: 7 respondents, environmental: 2 respondents, social services: 6 respondents, tourism and labour: 1 respondent, elderly care: 8 respondents, childcare and education: 2 respondents and cultural and leisure: 1 respondent.

3.3. Measuers of Construct

After the literatures study and the reading of various literature that both explained the concept from the philosophical aspect and a practical aspect, and literature of how the variables was applied within the manufacturing industry and service industry, the eight different focus areas, that was found well related to the concept, was constructed; customers, processes and system thinking, value-adding and non value-adding activities, visualization, standardization and demand driven production, leaders, employees and continuous improvements. According to Hines et al., (2004) the definition of the lean concept can be quite vague, therfor the eight different focus areas was compiled with the aim to give a more systematic way to read about the concept and further on to make the primary data survey, which was based on these focus

areas, more systematic. The different focus areas are based upon the most frequently produced variables in the literature, which are variables that explain both a way of thinking and a way of working with lean. We chose not to focus on the different tools or complicated terms. This is because the lean concept is more about creating a strong company culture than practicing the different tools (Larsson, 2008). Moreover, Patel et al (2003), implies that to proceed with a survey as systematic as possible, it is important to clarify and explain what the lean concept is and also which variables that are highlighted when it comes to practice lean within service organizations, therefore a short explanation of each focus area was constructed, with the aim to explain if any vagueness.

The survey language was in Swedish, the respondent's native language, with aim to make the survey easier to understand and hopefully eliminate uncertainties and confusion among respondents. The questions was formulated in a correct, short and understandable way. Contractions, strange words and specialist terms were not used, something that should be avoided according to Holme and Solvang (1997). With the aim to make the questions easier to understand and also easier to relate to, avoidance was made on questions based on technical terms

Each focus area was in turn divided into two different types of questions. The first sorts of questions were "work-related questions", these were about the extent to which they worked and thought about each focus area. They answered on an ordinal scale with seven grades, where 1="small extent" and 7="large extent". 0="No extent" could be chosen by respondents who did not work with the variable. The second type of questions was "opinion related questions" these questions were about the importance of the lean way of working and thinking in aspect of becoming effective. These questions were answered from 1="low importance" to 7="high importance" on an ordinal scale with seven grades. Even if they had not implemented the different variables that the questions aimed at, they could still answer the questions because it was related to their opinion. Complementary questions were made regarding in which department within the municipality they were practicing lean, for how long time they had practiced lean and finally, to what extent they had managed to improve and make the processes more effective.

3.4. Process of Data

After the data was collected it was compiled. Thereafter a statistical analysis was done, followed with presentation of the results and conclusion.

The responses were compiled from Google Form in a spreadsheet that was imported directly to Microsoft Excel, which was used for statistical analysis of the answers. One of the advantages of web a survey instead of a post survey is that errors in the input of data to the system of responses disappear when the data is not compiled manually (Dahmström, 2005).

A a table for each focus area was compiled, showing if the respondents practiced variables related to the eight focus areas, which can be found in appendix. If the respondent answered

“no extent” on a question, that was presented with frequency in the table. In the same table the percentage distribution on the ordinal scale of the work-related questions was presented for them who practiced the different variables. Mean and standard deviation was also presented for them who practiced the variables.

A mean of every respondent's answers from each focus area was compiled for them who practiced all variables within the focus area. The average was then compiled on a new ordinal scale that showed the aggregated answer for the respondent on an overall perspective for the focus area (Table. 3). The mean of the aggregated answers was presented together with standard deviation. If the respondent answered “no extent” they were not included on the aggregated scale. The opinion related variables was processed in the same way, but only presented on an aggregated level (Table. 6). The answers were unambiguous, which is strengthened by the lower standard deviation. Therefore, the answers is only presented on an aggregated level.

4. Result & Analysis

4.1. Descriptive statistic & findings from telephone interviews

The following results represent the municipalities that have stated that they practice lean. Overall the lean concept is not implemented in the whole municipalities but rather in one or some of the service departments. This is supported by Crnkic (2010) who showed that work with lean is not implemented overall in the municipalities, rather in parts of the municipality. However, many respondents showed a great interest for the concept when talking to the municipalities over the phone. Some of the municipalities that were excluded from our survey, because they stated that they did not practice the lean concept, gave some interesting statements; they had been on courses and seminars dealing with lean but yet not practiced it; they had been inspired by the original ideas behind the concept; they worked lean-like, but choose not to call it lean; and that they had plans to introduce lean. Other municipalities worked with identifying processes, which is one part of lean, however they did not practice the rest of the concept. However, the majority, 178 municipalities, answered that they did not practice the lean concept.

4.2. Where & when lean was implemented

*In table 1 indicate where lean is practiced within different service departments within the municipalities.*¹ *Table 2 shows when the municipality started to practice the lean concept.*

Table 1. Departments within the municipality		Table 2. When the municipality implemented lean	
	Frequency		Frequency
Municipal leadership and administrativ process	20	During the last year	3
Social services	15	1-2 years ago	20
Town planning	13	3-4 years ago	9
Elderly care	12	5 years ago or longer	2
Childcare and education	8	Do not know	2
Tourism and labour	6		
Cultural and leisure	2		
Environmental	2		
Public transport	1		
Do not know	1		

As shown, municipal leadership and administrative processes is where the lean concept is practiced most frequently. Which could indicate that lean projects is proposed and tested at a high level in the municipalities, to at a later pahse be spread within the municipalities. Table 2 shows that municipalities only have worked with the concept for a few years. Most municipalities have worked with lean for 1-2 years. This might be explained by the fact that it is a relatively new phenomena in the public sector and that the implementations starts on a department level and successively is implemented it in whole municipality.

¹ The respondents were asked where lean was practiced within the municipality that they were aware of. If there were two respondents from the municipality these answers were merged and only counted ones.

4.3. Comparison between different focus areas

The results in table 3 shows the extent to which they are working and thinking of the different focus areas in their daily work. The answers given from the tables in appendix have been merged to give an overview of the focus areas.

Table 3. Practice of different focus areas, an overview of work-related questions

Focus areas	1	2	3	4	5	6	7	Mean	Standard deviation
	Small extent			Large extent					
Customers	0,0%	0,0%	7,5%	20,0%	32,5%	30,0%	10,0%	5,1	1,07
Processes and system thinking	0,0%	2,6%	5,3%	15,8%	28,9%	34,2%	13,2%	5,1	1,18
Value-adding and non value-adding activities	0,0%	2,6%	5,1%	20,5%	35,9%	12,8%	23,1%	5,1	1,12
Visualization	0,0%	8,1%	5,4%	35,1%	27,0%	13,5%	10,8%	4,6	1,32
Standardization and demande driven production system	0,0%	0,0%	2,7%	27,0%	43,2%	27,0%	0,0%	4,8	0,84
Leaders	0,0%	0,0%	5,1%	12,8%	30,8%	28,5%	12,8%	5,5	0,99
Employees	0,0%	0,0%	0,0%	18,4%	36,8%	42,1%	2,6%	5,3	0,78
Continuous improvements	0,0%	4,9%	4,9%	9,8%	29,3%	39,0%	12,2%	5,4	1,15

What can be seen is that the municipalities work with all focus areas in a relatively large extent. Leaders had the highest average, followed by continuous improvements and employees. However, we can conclude from the results that the average and the standard deviation do not differ significantly between the different focus areas.

As mentioned, most of the questions are answered similarly with high averages. However, we have chosen to highlight some of the results that we found more interesting. The result we are highlighting can be found in appendix.

According to their work with customers, it is notable that municipalities to a lower extent continuously measure how satisfied the customers are with the services (4,8). Explanations for this might be that the municipalities are not as concerned of how the customer perceives the service, since the municipality in many cases has a monopoly on the service they provide, leading to that the municipality or the department not face any competition. We believe this may be one of the reasons why the customer satisfaction is not practiced in the same extent as other variables within the customer focus area. If municipalities ignore this, it might lead to the production of services which, is not demanded by customers, per se creates waste. (Eriksen et al., 2008; Larsson, 2008). According to Seddon (2010) it can be complicated to

design a service since different customers have different preferences. However, this did not seem to be a problem for the municipalities since they in the survey answered that they had identified the customer in a relatively high extent with an average of (5,0).

The municipalities have mapped out the processes in the aspect of main processes and supporting processes scored the lowest average with (4,3) regarding the focus area: process and system thinking. This supports Larsson (2008), when he argues that it is more difficult to map the processes in the service organizations, than in manufacturing organizations. Something that is even more difficult, is to divide the process into main processes and supporting ones.

To what extent the municipalities worked with minimizing the risk for emergence of non-value adding activities in the future, had the highest standard deviation and also the lowest average of (4,8) of the results related to the focus area value adding and non value adding activities. Although this was done to the lowest extent of the respondents, we believe that they, to some extent do this unconsciously when planning the new more efficient processes.

The variables related to metrics lowered the average for the entire focus area for visualization. The municipalities worked with with visualization of metrics (4,2) and metrics to understand and improve the processes (4,1) to the lowest extent. Collaborative learning can be made if metrics are used and measurements are done according to Seddon (2010), which the municipalities might miss due to low integration of the usage of metrics in the daily work. However, they visualized the different processes to a greater extent (5,4) and used boards, pictures and other similar tools when visualizing (5,6). The respondents' work with metrics and visualizations are varied. The only variable that was practiced to some extent by all respondents was regular evaluations of results, which could be linked to the budget control that exists within municipalities. All other questions within this focus area were practiced at no extent of one or more respondents, therefore the standard deviations are relatively high

The result related to standardization and demand driven production system shows that the municipalities in a larger extent practice a flexible way of working than focusing of the standardization of services. This supports that standardization of the services is something that is difficult to implement Eriksen et al. (2008). Three respondents answered that they could not at all meet potential variation (4,4), and only one respondent that answered that they could do meet the variation to a large extent. Something that may be explained by the that it often takes more time to take decisions in the public sector than in private. Could also be related to fact that they are not doing sufficient customer surveys to identify what customers want and when the customer wants it. Through empowerment and greater responsibility employees can make the necessary decisions that are needed to perform different types of services and increase the flexibility so they can meet the customers' need is in that specific moment according to Seddon, (2008) and Womack et al. (2003). However, the bureaucracy within the municipality might be counterproductive to the employees ability to execute flexibility and standardize work, even if the respondents tend to answer that not is the case.

Leaders involvement in the implementation of lean was large (6,2), over half of the respondents answered that leaders had been involved to a large extent. This could indicate that leaders or authorities most likely are involved in a the steering or the project group. Leaders are not to the same extent out in the operations in the daily work (4,9), but still they state that the leaders are good role models (5,5) and also give support to the staff and provide feedback (5,7). Since it is primarily managers and leaders who answered the survey responses may potentially be exposed to some subjectivity.

All respondants answered that the employees was given the possibility to influence something they disliked, all answered 5-7 on the scale except two. Leading to the highest average among the employees' variables (6,0). Secondly highest rated was the employees were allowence to vary and influence their work (5,8). Employees have to greater extent been given training in lean, rather than to continuously get education and training in their daily work. This could indicate that municipalities not had the time to start giving continuously on-the-job training, instead they might focus on teaching employees lean, since most began with lean 1-2 years ago which is a relatively short period of time, hopfully on-the-job training will evolve over time.

The results related to continuous impovments show that municipalities see errors that occur as an opportunity to improve existing processes to a large extent (5,8). Moreover, they had a lower average when working to remove the risk of emergence of non-value activities in future processes (4,8). There was engagement to improve and develop the workplace, all answered from 2-7 (5,1). All respondents' answers indicated that they practiced all variables in the area continuous improvements.

4.4. Comparison between different time since implementation

In table 4 a summarize have been made of each different focus area and the average of the extent to which the different focus areas are practiced compared to how many years lean has been implemented in the municipality.

Table 4. Practice of different focus areas and years since implementation

When the municipality started working with lean (mean)	During the last year	1-2 years ago	3-4 years ago	5 years ago or longer
Customers	4,2	5,0	5,4	5,9
Processes and system thinking	3,8	5,1	5,3	5,8
Value-adding and non value-adding activities	4,7	5,,2	4,8	5,8
Visualization	3,4	4,3	5,1	5,5
Standardization and demande driven production system	4,5	4,9	4,9	4,7
Leaders	4,8	5,5	5,2	6,5
Employees	4,7	5,3	5,2	6,1
Continuous improvments	4,0	5,5	5,3	5,9
Mean	4,2	5,1	5,1	5,8

A clear trend can be identified which is that the respondents that have practiced lean for a longer time period is also practicing the different variables to a higher extent. This might be because lean has had a success within municipalities and that they are satisfied with the outcome of these practices, which has led to an even more leanness way of working, subconsequently the practice of the variable in a larger extent. The group that differs most from the others is the one that started work with lean during the last year, which has the lowest average. One reason for this could be due to the fact that they have not had the time to fully implement a lean way of working and that it takes time for the organization to adapt.

4.5. Comparison between different departments within the municipality

In table 5 a summarize have been made of each different focus area and the average of the extent to which the different focus areas are practiced in relation to the different service departments.

Table 5. Practice of different focus areas compared to different service departments

Department within the municipality (mean)	Municipal, leadership and administrative processes	Town planning	Environmental	Social services	Tourism and labour	Elderly care	Childcare and education	Cultural and leisure
Customers	4,9	5,7	4,2	4,9	4,4	4,6	5,4	3,8
Processes and system thinking	5,3	6,1	4,8	4,6	4,5	4,5	5	4,8
Value-adding and non value-adding activities	5,3	5,3	4,3	5,1	5,3	4,8	5,1	4,0
Visualization	4,3	4,5	5,2	4,1	3,1	5,4	3,6	4,7
Standardization and demande driven production system	5,0	5,4	4,1	5,0	5,3	4,5	4,2	3,8
Leaders	5,0	6,2	6,4	6,1	5,4	6,0	4,9	4,2
Employees	5,1	5,5	5,8	5,3	5,9	5,6	5,5	4,4
Continuous improvements	5,1	6,0	6,0	5,5	5,3	5,8	5,2	5,3
Mean	5,0	5,6	5,1	5,1	4,9	5,1	4,9	4,4

It is hard to draw any conclusions from the table since most of the groups have almost the same average (4,9-5,1), except town planning that had a higher average. The higher average is explained by the higher average on the focus area 2: the process and system thinking. It seems easier to identify the processes within town planning than in for instance elderly care. We believe one reason is the difficulty identify processes when human are involved. And the problematic when handle people as part of a process or sub process. Cultural and leisure stood out as well with lower average (4,4), but was only represented by one respondent why we chosen not to put focus to this discrepancy.

4.6. Comparison between the different focus areas in aspect of becoming effective

The results in table 6 shows that they believe it is important to work with all the focus areas in aspect of becoming effective. The answers have been merged to give an overview of the focus areas.

Table 6. Importance of different focus areas, an overview of opinion-related questions

Focus areas	1	2	3	4	5	6	7	Mean	Standard deviation	
	Low importance				High importance					
Customers	0,0%	0,0%	0,0%	0,0%	7,3%	31,7%	61,0%	6,6	0,54	
Processes and system thinking	0,0%	0,0%	0,0%	0,0%	7,3%	24,4%	68,3%	6,5	0,59	
Value-adding and non value-adding activities	0,0%	0,0%	0,0%	0,0%	7,3%	29,3%	63,4%	6,5	0,66	
Visualization	0,0%	0,0%	0,0%	2,4%	22,0%	29,3%	46,3%	6,2	0,76	
Standardization and demande driven production system	0,0%	0,0%	0,0%	0,0%	9,8%	48,8%	41,5%	6,2	0,61	
Leaders	0,0%	0,0%	0,0%	0,0%	4,9%	31,7%	63,4%	6,5	0,52	
Employees	0,0%	0,0%	0,0%	0,0%	7,3%	36,6%	56,1%	6,4	0,49	
Continuous improvements	0,0%	0,0%	0,0%	0,0%	2,4%	22,0%	75,6%	6,7	0,48	

The opinion of the respondents was overall that all areas were of high importance in aspect of becoming effective, giving a spread in average from 6,2-6,7. The focus areas that had a slightly lower importance was the focus areas 4: visualization together with the focus area 5: standardization and demand driven production systems. This could be a result from the fact that the areas were practiced in a lower extent than others and therefore the respondents have not experienced the importance of these areas. Moreover that standardization is difficult to implement in service organizations (Eriksen et al., 2008) which, also is showed in the results in table 3 and thereby are missing the benefits from the standardization of service, however discussions can be made whether it is possible to fully standardize a service, something that can be supported by Seddon 2008 and Womack et al., (2003) that states that there is a great need of flexibility because there is a great variability in the customer demand.

4.7. Improved & more effective processes

The result in tabel 7 shows to what extent the lean way of working and thinking had managed them to improve and make the processes more effective.

Tabel 7. Improved and more effective processes

	0	1	2	3	4	5	6	7	Mean	Standard deviation	
	No extent	Small extent	Large extent								
To what extent the lean way of working and thinking had managed improve and make the processes more effective	0,0%	2,4%	0,0%	2,4%	26,8%	24,4%	29,3%	14,6%	5,2	1,27	

All respondents claimed that they to some extent managed to improve and effectivete their processes, which means that the lean concept can act as a tool to effective the municipality. This is consistent with the fact that lean can have a significant impact on organizations' wealth, health and competitiveness (Atkinson, 2004; Knuf, 2000). Additionally it can be supported with the study of Ögren and Rüte's (2009) that showed positive results obtained by the introduction of lean in the public sector, indicating the usefulness of lean as a methodology for developing these types of organizations.

5. Discussion & conclusion

The objective of this thesis was to examine if the Swedish municipalities practiced the lean concept. We wanted to investigate if they had adopted and practiced the same variables, within the focus areas we found through our literature review, and also to identify the extent to which they were practicing the different variables. In addition, to see how they evaluated the different variables in aspect of becoming more effective.

In our research we have found that the lean concept is practiced in Sweden's municipalities. Out of the 242 contacted municipalities, 64 municipalities of them stated that they practiced the lean concept in some extent. That is about 26 % of the contacted municipalities and about 22% of all existing municipalities in Sweden. Overall the lean concept was not practiced in the whole municipality; instead it was implemented in one or some of the different service departments. However, this is probably related to the fact that the implementation of lean in the public sector is relatively new. This is supported by the fact that the majority of the municipalities that practiced lean only had practiced the concept between 1-2 years. In addition, there was a relatively high interest of the lean concept. During the interviews over the phone many of them who were not practicing the lean concept stated that they were thinking of, or were about to implement the concept in their organization.

However we have not notices as stated by Røvik (1988) that concepts are adjusted to fit within the new organizations. Our result show that the municipalities are working with the

concept in a rather similar way and an explanation for the results that are spread the most can be deduced from the fact that the different department have worked with the concept for a shorter period of time and therefore have not implemented the different variables in the same extent. Moreover we did not expected that the results would be that homogeneous, Starting the study we believe that different municipalities would have interpreted the concept in a larger variety of ways and as our questions was based on the litterature study we believed that there would be a major divergence of the result, since authors stated in the literature that academics and users have developed different views of lean (Hines et al., 2004).

Our conclusions from our results can be summarized as followed; the lean concept is practiced in Swedish municipalities, at least 64 municipalities and probably even more today because several municipalities said they were thinking of testing the lean concept or were in phase to start up a lean project. Though the majority had implemented the concept in a department and not in the whole municipality. Their way of working with the concept are relatively homogeneous, which can be seen from the relatively low standard deviations in the respondents answers, the respondents has answered that they work with the same variables and also that they work with them in a relatively same extent, and if not its mainly because they have not worked with the concept for a particularly long time. Additionally the concept are applicable in different types of service environments, related to the fact that all different service department had implemented lean and worked with it in a relatively high extent. What we also found interesting is that all respondent have in some way agreed to the fact that the lean concept has helped them becoming more effective. Which is in favor for the New Public Management theories stated by Grouning and Lapsley et al., (2001) and even though the lean concept from the beginning is a manufacturing management concept from the private sector it can be adopted in a service producing public organization and have a positive impact on their efficiency.

5.1. Limits of study & suggestion for further research

When taking contact with the municipalities, there is a possibility there could be elements within the municipality that are practicing lean without the chief's knowledge. Our loss in the 48 municipalities that we did not come through, may have influence on our results, which must be taken into account. Respondents also have voluntarily chosen to participate and there is a risk that those who choose to respond may have a more positive attitude to lean than those who chose not to answer the survey which can affect the result of our survey.

The lean concept is constantly evolving and it will always be those who have come longer in the development than others. When making measurements on humans, the test cannot always be performed again with the same results, because the impact of the humans in the processes. (Patel et al., 2003) There may also be parts of the concept that we did not capture in our study, due to the fact that the definition of the lean concept is vague. (Hines et al., 2004)

During this study we have noticed a great interest of the lean concept within the public sector. The research field of lean within municipalities is in many aspects unexplored. Our

suggestions for further research within the field are to examine why municipalities have adopted lean and the effects of the lean concept among the municipalities.

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7. Appendix

Table 8: Customers

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent have you identified and mapped out who are your customers?	0	2,4%	2,4%	7,3%	4,9%	22,0%	24,4%	36,6%	5,6	1,51
To what extent do you systematically examine what the customer is demanding?	0	2,4%	7,3%	4,9%	14,6%	36,6%	19,5%	14,6%	4,9	1,47
To what extent do you adapt and develop your services to the customer's needs?	0	0,0%	2,4%	12,2%	12,2%	36,6%	26,8%	9,8%	5,0	1,22
To what extent do you measure continuously how satisfied the customer is with your services?	1	2,5%	7,5%	12,5%	7,5%	40,0%	15,0%	15,0%	4,8	1,54
To what extent is the customer and the customer's needs in focus when strategic and operational decisions are made?	0	0,0%	0,0%	7,3%	14,6%	31,7%	31,7%	14,6%	5,3	1,11

Table 9: Processes and system thinking

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent have you mapped out your processes and the activities involved in the processes?	1	5,0%	10,0%	5,0%	17,5%	32,5%	15,0%	15,0%	4,7	1,65
To what extent have you mapped out the processes that are the main processes and those that are supporting processes?	3	7,9%	10,5%	7,9%	34,2%	15,8%	7,9%	15,8%	4,3	1,74
To what extent have employees been involved in the mapping out of processes?	1	0,0%	2,5%	5,0%	0,0%	17,5%	12,5%	62,5%	6,2	1,27
To what extent do you agree how you want that processes should look like in the future?	1	2,5%	2,5%	7,5%	15,0%	20,0%	12,5%	40,0%	5,5	1,61

Table 10: Value-adding and non value-adding activities

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent you proceed from the customer's demands and needs when you identify which activities are value-adding?	1	0,0%	2,5%	0,0%	12,5%	37,5%	17,5%	30,0%	5,6	1,18
To what extent have you mapped out the activities that are value-adding and non value-adding?	1	2,5%	0,0%	10,0%	15,0%	35,0%	15,0%	22,5%	5,2	1,41
To what extent have you reduced non value-adding activities?	0	2,4%	0,0%	9,8%	14,6%	36,6%	17,1%	19,5%	5,1	1,36
To what extent do you work to minimize the risk of the emergence of non value-adding activities in the future?	0	2,4%	7,3%	17,1%	12,2%	24,4%	12,2%	24,4%	4,8	1,71

Table 11: Visualization

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent do you visualize the different processes?	1	2,5%	2,5%	5,0%	12,5%	27,5%	22,5%	27,5%	5,4	1,46
To what extent are boards, pictures and other similar tools used in visualization?	1	2,5%	2,5%	2,5%	7,5%	30,0%	25,0%	30,0%	5,6	1,40
To what extent are you working with metrics?	2	2,6%	5,1%	28,2%	17,9%	20,5%	10,3%	15,4%	4,4	1,60
To what extent do you visualize metrics?	3	7,9%	5,3%	23,7%	21,1%	21,1%	7,9%	13,2%	4,2	1,68
To what extent are regular evaluations of the results done?	0	2,4%	4,9%	22,0%	12,2%	24,4%	19,5%	14,6%	4,7	1,58
To what extent are you working with metrics to understand and improve processes?	2	5,1%	12,8%	23,1%	20,5%	12,8%	20,5%	5,1%	4,1	1,62
To what extent are you working with metrics to motivate employees and increase the quality of work?	2	5,1%	15,4%	23,1%	12,8%	15,4%	12,8%	15,4%	4,2	1,82

Table 12: Standardization and demand driven production

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent is your work standardized?	2	0,0%	7,7%	15,4%	25,6%	33,3%	7,7%	10,3%	4,5	1,34
To what extent is the way of working flexible and provides the ability to meet customer's different needs?	0	0,0%	0,0%	9,8%	22,0%	17,1%	31,7%	19,5%	5,3	1,27
To what extent do you succeed creating an even coating on the production of your services?	2	2,6%	5,1%	15,4%	33,3%	20,5%	17,9%	5,1%	4,4	1,35
To what extent can do you face potential variation in demand?	3	2,6%	2,6%	21,1%	23,7%	26,3%	18,4%	5,3%	4,4	1,35
To what extent do you succeed meeting customer demand and produce the service at the right time?	0	0,0%	0,0%	12,2%	12,2%	34,1%	36,6%	4,9%	5,1	1,08
To what extent are you working on creating flow in your processes?	0	2,4%	4,9%	4,9%	14,6%	26,8%	26,8%	19,5%	5,2	1,48

Table 13: Leaders

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent are leaders involved in the implementation of lean?	0	0,0%	0,0%	0,0%	12,2%	12,2%	19,5%	56,1%	6,2	1,06
To what extent are leaders in the business good role models for the employees?	0	0,0%	2,4%	4,9%	14,6%	26,8%	17,1%	34,1%	5,5	1,35
To what extent are leaders supportive of the employees and give feedback?	0	0,0%	4,9%	2,4%	7,3%	26,8%	19,5%	39,0%	5,7	1,37
To what extent are the employees kept free from liability for faults and shortcomings that arise?	1	0,0%	5,0%	7,5%	12,5%	40,0%	15,0%	20,0%	5,1	1,35
To what extent are leaders out in the business and taking part of the daily work?	1	0,0%	10,0%	10,0%	17,5%	22,5%	25,0%	15,0%	4,9	1,52

Table 14: Employees

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent are employees given the possibility to influence something they dislike?	1	0,0%	0,0%	2,5%	2,5%	25,0%	35,0%	35,0%	6,0	0,96
To what extent are employees allowed to vary and influence their work?	1	0,0%	0,0%	2,5%	12,5%	22,5%	27,5%	35,0%	5,8	1,12
To what extent are employees given training in lean?	1	5,0%	0,0%	15,0%	7,5%	10,0%	27,5%	35,0%	5,4	1,73
To what extent are employees given continuous education and training in the daily work?	1	0,0%	5,0%	15,0%	15,0%	32,5%	17,5%	15,0%	4,9	1,40
To what extent are employees allowed to make their own decisions without consulting higher management?	1	0,0%	0,0%	2,5%	12,5%	40,0%	27,5%	17,5%	5,5	1,00
To what extent are the employees loyal and dedicated towards joint decisions?	1	0,0%	2,5%	7,5%	7,5%	42,5%	25,0%	15,0%	5,3	1,18
To what extent are the employees telling if they commit errors?	0	4,9%	2,4%	4,9%	19,5%	36,6%	24,4%	7,3%	4,8	1,38
To what extent are you cooperating across functional boundaries?	1	0,0%	7,5%	12,5%	15,0%	32,5%	27,5%	5,0%	4,8	1,32

Table 15: Continuous improvements

Work-related	0	1	2	3	4	5	6	7	Mean	Standard Deviation
	No extent	Small extent								
To what extent do you see the error that occur in the business as an opportunity to improve existing processes?	0	2,4%	0,0%	7,3%	7,3%	14,6%	24,4%	43,9%	5,8	1,45
To what extent have all in the business interests of the workplace and to continually improve and develop it?	0	0,0%	4,9%	7,3%	9,8%	39,0%	24,4%	14,6%	5,1	1,28
To what extent do you develop and implement new and improved processes?	0	0,0%	2,4%	7,3%	19,5%	17,1%	34,1%	19,5%	5,3	1,31