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Public procurement measuring

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ABSTRACT

Public procurement represents annual government expenditures of over 400 billion NOK. Nonetheless, the lack of a well-established public procurement measurement system constrains the government from attaining a competent and well-developed procurement that guarantees value for money. The creation of the European Union public system policy has particularly played a critical role in ensuring that governments have a reliable framework to guarantee value for their money, besides having compliance standards that the government can look up to identify the competence of a bidding firm in translating its objectives. Consequently, coupled with the growth of the information technology sector, public procurement has seen an overwhelming growth, whereby governments no longer have to engage only in the manual selection of qualified bidders. Instead, a competent and transparent panel that runs online automatically looks into the qualifying attributes based on service quality and costs. The results are then displayed for all other bidders to acknowledge the competencies of the approved firm.

Norway's leading procurement experts, Direktoratet for forvaltning og IKT (DIFI), has shown some errors and deficiencies in Norway´s procurement system; they have pointed out that functions of the procurement system can be professionalized substantially. DIFI estimates that this would lead to savings of about 20 billion NOK. Menon also made similar estimates earlier, partly based on DIFI estimates. These estimates were also based on interviews with actors who have professionalized their purchases and experiences in other countries. Because purchases grow steadily, the potential for savings will also grow. Unless professionalization gets much stronger, we stand as a society in danger of wasting nearly 100 billion NOK in the next four-year period. This corresponds to almost the entire cost associated with inter-city development.

To resolve the problems that face the public procurement sector, the following study seeks to identify some of the challenges that Norwegian multiplicities undergo during measurement of the results after the purchase has been done. It suggests recommendations for the ideal research methods to ensure that the measuring of purchasing results is practised and based on the European Union specifications.

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CHAPTER 1
INTRODUCTION

1.INTRODUCTION

Annually, over 250,000 public authorities in the European Union spend about 18% of their GDP on the purchase of supplies, services, and works. In most sectors, including transport, energy, social protection, waste management, health, and education services, the principal buyers are public authorities. As a result, public procurement involves the process by which public authorities, including local authorities and government departments, purchase services, goods, or works from other companies. The common types of services outsourced by public procurement departments include the building of state schools, purchase of furniture for a public prosecutor's office, and contracting cleaning services. To ensure that there is a level playing field for all businesses across Europe, governments have taken the initiative of harmonizing public procurement rules across all the countries. These rules play an important role in organizing how the purchase of goods, works, and services should be done. The rules are transposed into national obligations and are then applied to tenders whose monetary values and national rules are applied. Nonetheless, the national rules have to abide by the EU laws.

This thesis will discuss practices that enable Norwegian municipalities to have more efficient procurement measuring systems. Norway is on a well-developed and steady road for the establishment of a reliable public procurement system that ensures economic growth and facilitates job creation in the sector. Despite a strong growth in the public procurement system, the performance of public organizations are often not measured and rewarded for professionalization of procurement. In the allocation letter, which sets out guidelines for what should be prioritized in public organizations, states usually know little or nothing about the professionalization and measuring of procurement. Some also speculate that the public sector organizations are often a disincentive to save money on purchases; the consequences of saving money means a lower budget the next year. Professionalization of procurement requires strategic efforts, and the results cannot be seen overnight. The following issues will be discussed in this thesis:

- Purchase must be redefined as a strategically important function. It needs to be moved from a "back-office-function," as seen in some cases today.
- You must know what you buy. Specialization and professionalization requires expertise. The public sector must involve professional skills throughout the procurement process.
- Central and local managers working in the public sector must be measured based on professionalization and savings related to purchasing. Disincentive to savings must be terminated.
- What are the primary tools and measuring suggestions, and what are the steps to be taken to reach these suggestions?

1.1 AIM

The major aim of the research is to highlight how Norway can implement a reliable measuring system to streamline its investments and procurement. The primary concern of this thesis is to identify suggestions for measuring and detecting the measuring tool.

1.2 PROBLEM STATEMENT

Public procurement is one of the most influential sectors of the country's economy. Nonetheless, lack of reliable measuring procedures to ensure a result-oriented purchasing process inhibits the country from achieving its full potential. Therefore, this study seeks to structure some effective measuring suggestions for cost-savings; it will also discuss alternative factors that the country can put in place to ensure that the process of public procurement is professionalized to create an inclusive and better economy.

1.3 SCOPE OF THE STUDY

This study will focus on sustainable procurement measurement within the Norwegian municipalities. The answer to my problem statement will be presented by discussing reliable tools for influencing the level of measuring done by the municipalities. The thesis will also mention suggestions for measuring based on the literature provided by the public sector. The structure of this thesis is as follows:

1. Firstly, literature related to the main challenges surrounding the thesis was collected. The most relevant theoretical information is included in the literature review.

2. Secondly, I conducted interviews with procurement managers in five different municipalities. The interview questions were based on the challenges expressed by the literature collected. The result from the interview further helped identify the key question of the surveys.

3. Thirdly, answers from 49 survey respondents were presented; these responses show on what scale the Norwegian municipalities actually perform the suggested activities related to measuring. The suggested activates that enable measuring were identified by literature and confirmed by the interview respondents.

4. Fourthly, the significance of the surveys, which resulted in three hypotheses, was tested in a regression analysis done in SPSS. Regression analysis will be defined if the collected data and suggested activities are related to the dependent variable (measuring). The correlation level is defined by the positive or negative statistical significance of tree hypothesis.

   H1: Standardized processes give better procurement measuring
   H2: Higher investing in competence gives better procurement measuring
   H3: Use of E-procurement gives better procurement measuring.

5. Lastly, I present a conclusion of the interview along with survey results and the result from the SPSS regression analysis. The result will define the value and significant of this thesis. In the same chapter, the limitation study concerning limitations of all the methods used will be presented.

1.4 METHODOLOGY

The methodology of this study involves seven different chapters, which are given below:

1. Formulation of the issue and the problem statement, objectives and scope of study
2. Literature review
3. Research methodology
4. Review of questionnaire results
5. SPSS results
6. Limitations and discussion
7. Conclusion and recommendations

CHAPTER 2
LITERATURE REVIEW

2. INTRODUCTION

This chapter provides the background of the study and presents a strong foundation for designing and formulating the research methodology. Literature review of the thesis contains reviews and opinions of the different authors and researches related to the research topic and a presentation of the variables that assist in generating the hypothesis statement.

2.1 THEORETICAL FRAMEWORK

This literature review starts with an evaluation of the general economic situation in Norway, which is quite central to understanding the importance of efficient public procurement measuring. It will also discuss the information provided by Nasjonalbudsjettet (2016), which examines what reforms and practices the state plans to undertake to make a better and more efficient public sector.

In addition, the review defines the understanding of necessary tools that need to be considered to perform procurement measuring. Measuring suggestions will be referring to public reports and theoretical papers. The information provided in this section will be further taken into consideration when developing interview question, surveys, and potential hypothesis.

2.2 NORWEGIAN ECONOMY

The year 2016 is estimated to be a challenging year from an economical viewpoint. Because of the different challenges, it is crucial that the government develops strategies for the effective use of resources that result in saving money wherever there is any possibility to do so. Growth in the Norwegian economy has slowed this year, and the total outlook is slightly weaker than assumed by the revised national budget. The fall in oil prices since last year has subdued growth in the demand for goods and services. Municipalities and cities that depend and connect to the oil industry face the most difficult circumstances. In Southern and Western Norway, unemployment has risen over the past year, whereas in other parts of the country, unemployment has reduced. Several factors point in the direction of the underlying growth in the Norwegian economy, which will be slightly lower than in the last couple of decades.

Although oil and gas will continue to provide substantial revenues for Norway for many years; the industry's contribution to growth in the rest of the economy is likely to be slow.

Economic development is characterized by several relationships. In the traditional industrial countries, economic growth is reduced when oil prices and interest rates are low. The price of oil has fallen from around 110 dollars per barrel in July 2015 to below 30 dollars a barrel in May 2016. Various circumstances have led to increased oil production and a large decline in demand last year. Expectations of higher oil supply from Iran because of the nuclear agreement, and signs of weaker financial growth in the Chinese financial market have contributed to price fluctuations this year. A weaker outlook for the Norwegian economy has led to the Norwegian bank reducing its key interest rate by 0.5 percentage points over the past year. The recovery after the global financial crises of 2008 and 2009 has been slow, and the rate of growth in the world economy is still lower than average for the past 20 years.

The Norwegian economy is going through a challenging phase, but Norway still has good prospects of recovering from a period of low growth in demand and activity. Value added per capita is high compared to most other countries. Norway also scores well on people's perception of their quality of life (Nasjonalbudsjettet 2016, 15–30).

2.2.1 Use of recourses and results

The expenditure of public budgets constitutes around 58% of value creation in the mainland, which is twice as much as it was fifty years ago. Common benefits such as defense, police, judiciary, and public administration are being financed from taxes and fees, just like in any modern society. When measured by employment rate, Norway has the largest public sector in OECD; and when measured by consumption share, Norway has a high position. Half of the public expenses are wages and purchases of goods and services in the public service. With a large public sector, it is particularly important that resources in the sector are used effectively. Increased efficiency in the public sector allows for better benefits in the short run, but it is also necessary for sustainability of public finances over time. The result of the public services are difficult to measure, since they are not traded in the market, but some information on how services assessed can be obtained from a citizen survey. This is a survey about management in Norway carried out by the public

management agency Direktoratet for forvaltning og IKT (DIFI) in 2010, 2013, and 2015. The survey covers businesses in education and culture, health care, and government agencies. They are involved in providing a better basis for evaluating the development of public services across sectors and in developing public businesses in the long run. In 2015, the survey showed that citizens are very pleased to stay in Norway.

DIFI reports a progress from 2013 to 2015 in a number of areas. At the same time, there are considerable variations between different areas. An important fact is the difference shown between different municipalities. A majority of the population wholly or partly agrees that the government complies with laws and rules and provides good quality services. These numbers have increased from 2010–2013. However, largest part of the population completely or partly disagrees that the government treats cases and applications quickly. More people also disagree that the public sector uses resources effectively (Nasjonalbudsjettet 2016, 121).

International comparisons of the level and quality of public services are challenging. Responsibilities, organizations, and expectations vary significantly between countries. The organization for economic co-operation and development (OECD) has done multiple analyses of international organizations, income redistribution, and the level of the rule of law, which are key indicators of an efficient public sector. Norway has an even distribution of income both before and after taxes and transfers. Norwegians have great confidence in the national government, such confidence is the basis for government legitimacy making interactions between authorities and citizens easier and more efficient. OECD also mentions that a high level of trust in authorities can make it easier to implement reforms. The level of the rule of law is measured in their analysis using an index from The World Justice Project. OECD has selected two factors: the limitation of government power and the protection of fundamental rights. Although the OECD is better placed than countries in other regions, there is considerable variation also within OECD countries. The Scandinavian countries are placed on top in both dimensions (Nasjonalbudsjettet 2016, 122).

One interesting fact for public procurement is that OECD finds a positive correlation between life expectancy and health expenditure per capita. The increase in life expectancy declines for high expenditure levels. Norway is among the countries that stand out for high cost of living, but our life expectancy is not particularly high. Within education, OECD finds a positive correlation between costs per pupil and the program or International Student Assessment (PISA) results; but this also points to high expense levels. When we say that Norway has a high cost of living, we have used PISA results that are under OECD average. These data directly imply that there may be room for improvement in the effective use of resources in the Norwegian public procurement system. Although the services provided by the public sector are generally good, indicators from OECD comparisons show that some countries get more out of their money than what Norway does. For the government to administer community assets well, the public sector has to be most effective. The results must be assessed openly and critically. Resources must be prioritized to those areas that are most important and to the measures that work best. At the same time, new technology or other changes in the regulatory framework make it possible to increase efficiency. New technology might open up entirely new ways of solving problems both in the public and the private sectors (Nasjonalbudsjettet 2016,123).

In May 2016, anskaffelser.no announced a new Internet platform providing key figures and statistics on various topics including how much state agencies spend on purchasing goods and services. According to the project leader Mona Storom Andersend, the new statistics provide a basis for better management of procurement on individual business. Statistics show the amount that state agencies spend on the procurement of goods and services and the procurement categories, such as ICT and transport. Statistics concerns mainly the state sector, but it also presents municipal figures on e-commerce. In addition to the figures and surveys of DIFI, data has also been taken from various other sources, such as National Accounts, the State Central Register, SSB, and the Administration Database operated by the Norwegian center for research data (NSD). Each state enterprise can extract its procurement statistics and compare them with others. This ability facilitates a higher degree of management and control of the procurement cost. According to Anskaffelser.no it could contribute to more efficient resource utilization.

Purchasing statistics are compiled on the basis of national accounts. The figures presented by DIFI may in some cases differ from the figures provided by other sources. The reason is that statistics are derived from different players who can add different definitions and calculations as the basis for various purposes. The online service was developed on behalf of the Ministry of Local Government and Regional Development and Industry and Fisheries Ministry (Anskaffelser.no, 2016).

2.2.2 Competition, deregulation and bureaucratization

Competition between manufacturers is essential for increased efficiency in the private sector. In the public sector, competition may contribute to increased efficiency, and the government wants to increase competition. The following practices may be relevant:

- Competition between public service producers by comparing their effectiveness and publishing the results (i.e., reference-testing or benchmarking);
- Performance-based financing (or "money follows user") combined with user selection. This means that the income of a public service manufacturer depends on the number of users. Users of services often get the opportunity to choose between both public and private producers.
- Competitive bidding, in which various providers compete for the right to produce goods or services on behalf of the public.
- Deregulation, which involves a former public monopoly having to compete with new private producers.

Good procurement requires both a professional ordering side and a supply side. Public entities must increase their competence and follow-up their purchases with the aim of developing innovation and improving supplies. It is also central to focus on the process of simplifying the public procurement regulations. During 2016, DIFI made central framework agreements on behalf of government agencies excluding defense (i.e., military). The goal is more professional purchasing processes and better purchasing. More cost-effective procurement can be achieved by combining the purchasing unit for purchasing standardized products instead of having different agencies separately perform the same job. The framework agreements shall be mandatory for government agencies in the public sector, but the national budget (Nasjonalbudsjettet, 2016) pointed out that business should have access to "fravalg" in individual competitions. In this way, a business

can choose not to participate in a single agreement if they consider this disadvantageous. To avoid adverse effects, marketing analysis should be regularly performed.

As in business, there is also efficiency potential in the public sector. To realize this potential, the government conducted bureaucratization and streamlining of reforms. The reforms provided incentives for more efficient government operations and created guidelines for priorities in the state budget. Part of the gain is transferred to the community in the annual budgets. The annual transfer is set to 1% of all expenses allocated from the state budget; for 2016, the amount was approximately 1.5 trillion NOK. Unnecessary reporting and duplication increases the time spent for citizens and ineffective solutions internally in the administration. The central government is working on measures to provide faster and better monitoring. The Ministry of Local Government and Regional Development prepared a guideline to help municipalities to eliminate time thieves. This will be finished in the first quarter of 2016 (Nasjonalbudsjettet, 2016, 124-126).

2.3 LITERATURE CONCERNING TOOLS ENABLING MEASURING

This part of the thesis will present research information provided by different authors regarding multiple tools that are necessary to achieve effective public procurement followed by efficient measuring. The tools mentioned are standardization of public procurement, competence, e-procurement.

Further, the chapter will also discuss how the effective use of resources can be measured. It will give numerous measuring suggestions and a guide to measuring procurement saving and benefits.

1.1 2.3.1 Standardization of public procurement

Procurement services in the public sector are under considerable pressure for performance improvements and to achieve financial savings through more efficient and coordinated service delivery. By using reliable research data, the government should be able to set a standardized vision for increasing efficiency and professionalism though structured collaboration and a national effort to adopt best practices for all public municipalities in the country. To accomplish such goals a common set of public indicators should be developed.

The Scottish government attacked public procurement challenges by involving representatives from each key part of the public sector in a research project investigating indicators for public procurement. According to (The Scottish Government 2008) through use of the information hub they managed to map an overview of their spending and supplier data from a significant number of high-spending public organizations in the country. By using this data, they were able to identify clear opportunities for regional, sectorial, and national collaboration; thereby negotiating a better deal through collective public spending. The government-concluded process of developing effective indicators relate to two main questions, namely, "Which aspects of public sector procurement's performance do we wish to improve and measure?" and "How can we measure those aspects of performance?". The structure developed is shown in Figure 1.

Figure 1 Copyright by: The Scottish Government. Edinburgh 2008

The Scottish government came up with following core deliverables.

Provide value for money procurement that delivers financial benefits:
In today's tight financial environment, it is crucial to have a team with the ability to achieve financial savings while ensuring that goods, work, and services are delivered at the required level.

Provide quality advice and contracts that deliver quality products and services:
At this stage, it is important to not let the motivation of achieving savings affect the quality outcome. The procurement team must have a clear understanding of their customers needs, and they need to provide the required customer service and assistance.

Process procuring goods and services in a lawful and ethical manner that encourages participation and sustainable economic growth: It is considered a fundamental duty to make sure that money is spent in a legal manner. Procurement should be done through open and transparent contracting procedures and, if possible, through prevailing economic, social, and environmental policies. The procurement process should be professionally advised aiming to contribute to the growth of a wealthier country.

In order to achieve the above-mentioned core deliverables, the following processes must be established.

Working effectively across public procurement sectors and organizations: Procurement must be performed more collaboratively than individually. Sharing of ideas and learning from others is considered a success factor.

Ensuring effective contract and supplier management: Procurement has to be done in close relation with the customers and the supplier, this is to ensure that business is done in a professional manner through the contract lifetime.

Communicating effectively and ensuring productive stakeholder and customer relations: The staff conducting the procurement must understand customer needs and assist customers by offering user friendly and professional advice.

Ensure compliance with good procurement practices: The staff conducting procurement needs to ensure that the established contracts are used. They need to frequently evaluate the spending of money and make sure it is spent legally and transparently.

Continuously improving performance and innovation: The public sector should always look for improvement, and the staff should be interested in receiving criticism and feedbacks.

To support these processes, the following resources must be available:

- Effective governance and accountability of procurement
- Skilled staff to resource the procurement process based on the value and risk of spend,
- An end-to-end e-procurement service, and
- A competitive supply base.

To monitor the progress of the implemented indicators, clear measuring suggestions need to be considered. The Scottish government monitors the core deliverables, key processes, and organizational capacity results using a balance scorecard. In their research, the best practice indicators are designed to encourage improvement in the area of efficiency, collaboration, compliance, skill, and e-procurement.

Efficiency. This will measure cash savings achieved by the procurement function.

Collaboration. This will measure how much is spent through collaborative contracts.

Compliance. This will measure how many purchases were made through contract. It uses customer satisfaction questionnaires to make ensure that price does not affect quality.

Skills. This measures whether the procurement functions like a professional and has a disciplined training path in which all progress is tracked and evaluated.

E-procurement. This measures the use of e-technology through stages in the procurement process in order to identify the best practices and weaknesses.

The management of both the public and private sector need to realize that to achieve full value of the government/company investments, it is necessary to focus on performance measurement and application tuning methods based on reliable data. When mapping and studying the procurement process, three requirements are crucial. First, a new set of metrics (beyond normal accounting measures) is required for capturing inter-organizational data. Second, an information-sharing mechanism is required for transferring information about cooperative benefits among channel members. Third, the allocation method is required for redistributing the rewards of cooperation in a way that all parties benefit fairly. If you do not produce a product and only operate within the procurement process, these factors are still important for achieving necessary data access (The Scottish Government 2008, 4–12).

2.3.1.1 KPIs

To investigate how public procurement should manage the establishment of KPIs, DIFI will be used as the main source of information. (DIFI, 2015) pointed out that Identifications and use of Key Performance Indicators (KPIs) is intended to support/guide the follow up and measure the results of the procurement system and the supplier. The tool´s intended to be used frequently throughout the contract period, and it should provide answers connected to procurement result and efficiency. Information about delivery within the agreed framework, and optimization possibilities should be easier to map and investigate when using tools such as KPIs.

It is not always necessary or essential to use a lot of recourses on small procurements; one instruction often practiced is the typical “80–20 rule”. However, the use of high resources could be important for more extensive agreements. The number of categories tracked and the number of measurement parameters will vary from deal to deal. Measuring and following up procurement will always be important in order to ensure that the agreement gives the desired outcomes and results. KPI´s were implemented in order to design a purpose for each procurement, and to measure if this purpose was sufficiently reached. To perform efficient investigation of KPIs, they should be collaborated with results from an analysis using the Kraljic matrix that will indicate how the municipality’s relationship is with the current supplier. This matrix will also provide managers with a strategic understanding of how to further proceed to reach the optimal agreement for price and quality. A challenging step is to actually consider how a supplier should be evaluated; this

is because there is a great variation from one supplier market to another. There are a number of typical KPIs, such as delivery precision, satisfaction, or price variance invoice, which is often used to measure supplier relationships. It is important to consider the most appropriate KPIs in the light of the market and the industry that the providers operate in. (DIFI, 2015) provides some hallmarks for efficient KPIs:

- KPIs are based on strategy and reflect the organization's goals.
- KPIs must be based on credible data, not guesswork or assumptions.
- KPIs are accurate; there is no doubt what you measure.
- Ownership of the KPIs must be linked to the right person in the organization. This person must be aware of what these KPIs measure and why they are elected.
- KPIs that lead to action by the deviation are to be analyzed. The responsible person must ensure that action is taken based on the results of the poll, and follow-up measures are also taken.

As previously mentioned, the Kraljic matrix can provide useful information about questions regarding the relationship one has with its supplier and which KPI resources one should have for following up this supplies. It may also be important to design a need analysis in which municipalities can map goals connected to each of their suppliers. The suggested goals should reflect the municipality's overall strategy (DIFI, 2015).

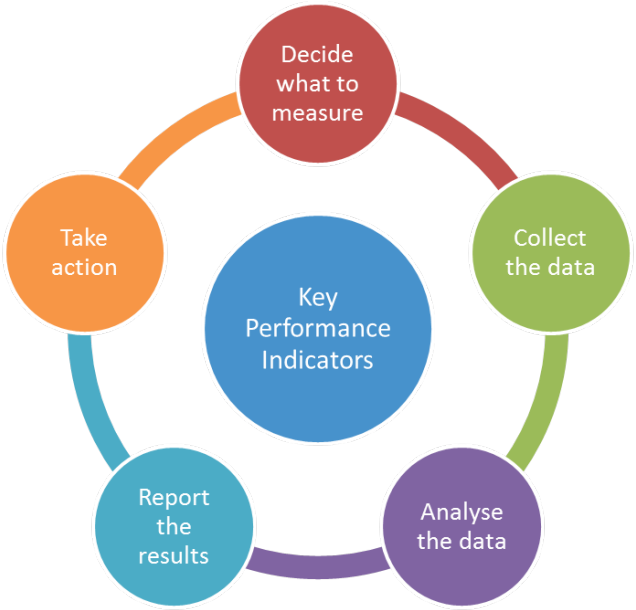

Figure 2 Copyright by: Flock Associates 2016 http://www.flock-associates.com/best-kpis-practice/

2.3.1.2 ICT

In order to achieve full mapping of a supply chain that provides reliable data for measuring performance, municipalities need to recognize the importance of integrated E-procurement software system. Designing reliable software and merging it with the designed procurement process and KPIs is critical for efficient measuring. To provide reliable information concerning this issue, I will refer to the National Association of State Procurement Officials (NASPO 2013) research paper. The audience for this paper is the NASPO membership, public procurement managers, and decision makers, Chief Information Officers, any procurement professionals directly affected by Enterprise Resource Planning (ERP) software and e-procurement implementations, and other interested parties.

Norwegian municipalities are implementing e-procurement systems because of the support and encouragement of having common principles for the public procurement purchasing process. Some of these principles provide increasing transparency, achieve value, promote competition, expand the supplier base, maintain financial controls, measure performance, and promote efficiency. Literature provided by the (NASPO, 2013) paper discusses the common complaints and difficulties related to e-procurement and ERP implementation. Some of the repeated challenges are related to high costs, the longtime taken for implementation, and the need for customization because of changes in the business environment. The surveys show that implementation and integration of the software solution is the most significant cost factor for implementing ICT software solutions. The example provided by NASPO shows that one comprehensive implementation of an ERP took seven years and a cost of tens of millions of dollars.

There are two different models for designing an e-procurement system; standalone and integrated. Because of limited access to information, I was not able to map e-procurement models of Norwegian municipalities, but their challenges are repeatedly associated with issues that come from standalone designs. The key disadvantage related to standalone e-procurement is the need not to pay invoices or establish budgets; it generally only serves the needs of the procurement function. Because of this, some detailed data relevant to purchasing is stored in separate databases, and it does not get integrated in the common database that invoices payments and budget data. As a final argument, the NASOP paper

pointed out that ERP suppliers today are looking to customize and offer their own branded e-procurement solutions. Public organizations should consider whether the functionality of their existing e-procurement solution could satisfy their needs. Municipalities should evaluate the development plans of their current software solutions to determine whether they have a strategy that is enabling their system to reach the same functionalities as their competitors or other municipalities. They should also investigate if their e-procurement system provides all the data needed to successfully map the procurement process and the KPIs. The situation of every state is different, and that is why it could be challenging to design a standardized solution that gives every agency its optimal benefits. A rule of thumb is that one implementation design over another depends on whether the solution that is chosen gives the best results for the need of each of the organizations (NASPO, 2013).

2.3.2 Competence

Scientific paper by (Menon, 2012) discussed the importance of higher competencies in the public sector, and estimated that the state and municipalities could save about 10–15%, which would amount to 10–20 billion NOK annually in professionalizing the procurement process. This has been documented through interviews with actors who have professionalized purchasing processes, interviews with experts in the field, and extensive amounts of literature review. Both literature and interviews clearly point in one direction. The increased use of expertise in the procurement process is a criterion for professionalization. Many mistakes seen today in the procurement processes can essentially be attributed to the lack of use of highly specialized personnel.

The procurement function today requires more skills than required previously. The purchases that the public sector performs today are much more specialized in goods and services than before. The goods purchased are often produced in other countries, and last, but not the least, stricter and more detailed government regulation of purchases helps boost demand for legal expertise. This clearly indicates that there is a need for higher and specialized expertise to make good purchases.

According to (Menon, 2012), the public sector has been buying increasingly. In 2011, the Norwegian public sector purchased goods and services for about 400 billion NOK. In 2000, the public sector purchased goods and services for about 220 billion NOK. The scope of the public procurement services has thus almost doubled in the period 2000–

2011. Some of the increase can be explained by inflation—parts of the public expenditure have been spent on buying the same goods and services at higher prices.

Lack of professionalism and expertise in procurement processes contribute to a variety of losses. (Menon, 2012) pointed out the most important factors are as follows:

· Missing or unclear definition of what is to be delivered. This is a significant factor that contributes to 3–5 % of all government procurement in incorrect deliveries that do not show any value.

· Unclear or wrongly formulated assignment and project descriptions that lead the management to come up with solutions that are not in the users' best interest.

· A lack of adequate expertise can in many cases lead managers to have problems with establishing appropriate criteria for identifying the most economical advantages or to determine which of the offers is best. This often ends with price being the only factor that is followed. In these situations, the sector is most likely to end up with the worst offer, which can have negative consequences or is not of optimal value for the user. A lack of ability to evaluate quality leads providers of high-quality products to avoid doing business with public procurement processes, which both reduces competition and the quality of the goods and services supplied.

· A lack of expertise means that procurement agencies in the public sector are unable to determine whether the delivery is in line with the order and the offer. Providers can thus get away with delivering "half-finished" products and services.

· A lack of expertise means that public purchasers have too focus on the delivery date and too little focus on how the product or service must be adapted to changing circumstances.

· A lack of expertise reduces the potential public procurement manager's power to act as a demanding, innovative purchaser. The focus on innovation within public procurement is too low today.

To avoid the errors and defects that are described above, the entire purchasing process must be made more professional. Technical expertise must be used actively in all phases. This means that specialized competence must be used in specifying the need, determining the allocation criteria, inquiring into the market, choosing solutions, and following up and implementing the solution. In many cases, it is possible to make savings in procurement processes by involving highly trained professionals more in the state and the municipalities. Smaller municipalities, however, often do not have the necessary internal competence. Hiring external cooperation, and including them in the processes can provide

savings far beyond the cost, and also teach the managers how to proceed further on their own-

When you invest in higher competencies, how can you make sure that he/she delivers? Competence is quite a difficult measuring parameter that often gives challenges. Some ideas for measuring competencies are suggested in many Norwegian municipalities. When given a job position, the new employee has to show savings results that are higher than the cost of his wages. This provides an overview of how much he brings in compared to what it cost to have him employed. As previously mentioned, this is the ideal measurement, but it has many flaws. In public procurement, the results of purchases cannot only be expressed through costs. The employee may find a more expensive product that really shows better quality. Another flaw that may occur is the identification of KPIs. Identifying the source of your problem should be done strategically. If not considered well enough, managers may have wrong perceptions regarding the suggested solution. This might result in hiring a person for a specific job that does not solve the key issue. This is one of the challenges that the public procurement process faces; therefore, municipalities need to understand the importance of integrating all the sectors through frequent two-way communication. If they use this comparable measuring suggestion and also consider other factors than cost, a more representative result may occur (Menon, 2012).

2.3.3 E-procurement

Globalization has made the use of information technology a critical part of the economy. Several governments are keen on the implementation of reliable systems to conduct procurement. In particular, e-procurement has emerged as a vital part of the economy, and its benefits have been found to guarantee efficient cost reductions and the time taken to conduct a public procurement process. Several states have made diverse advancements whereby they have even developed websites solely dedicated to handling procurement in their departments. The inclusion of critical information about the procurement process including the bid invitation process, annual procurement plans, and summaries of the bid evaluation reports have even made the procurement process a transparent process. Therefore, those involved in the process are sure that there were no favoritisms in awarding tenders to companies. Suppliers, contractors, and consultants would all be able to view the features of the portal system including elements such as the current and future bidding documents. Evaluation reports made on awards can also be examined to enable

other contractors to come up with feasible methods that would enable them to handle their work competitively.

The development of information and communication technology (ICT) has enabled several government institutions to create tools that can organize, transmit, store, and act on information digitally. The study by (Svidronova and Mikus, 2015) highlighted that the usability of IT has played an influential role in streamlining the performance of the public procurement sector. Moreover, coupled with the reforms of the government and the public administration sector, most of the innovations in public procurement are driven by ICT. The study emphasizes how e-procurement ensures that the tendering process is done fairly and without favoritism. (Svidronova and Mikus 2015) gave a comprehensive analysis of the stages of e-procurement including searching, sourcing, ordering, negotiating, receiving, and making post-purchase reviews. As a result, e-procurement is a transparent and convenient way to guarantee a competitive tendering process (Svidronova, Murray, & Mikus 2015).

The e-procurement platform anskaffelser.no contains services for organizing, linking, and operating electronic business processes between buying and selling businesses. The services include exchanging standardized electronic business documents between acquiring businesses in the public and providing goods and services.
The purpose of the e-procurement platform is to link government buyers and their suppliers together in a common, future-oriented infrastructure, in which participants can exchange their business documents electronically. The services will contribute to better, easier, and safer procurement through electronic links between government buyers and their suppliers. The procurement platform will also stimulate the supplier market in Norway to develop their level of expertise in electronic commerce (e.g., electronic catalog production, integrated business processes for orders, order responses, and invoices) in order to increase their competitiveness.

Anskaffelser.no has done further research and interviews with multiple public organizations, which show that the introduction of electronic commerce in a business supports the goal of the efficient use of resources. The research also shows that ICT and e-procurement give more access to data and a clearer overview of the total procurement process and result. This gives the sector a better possibility to map its activities and attach

measuring parameters where considered necessary. Limited access to data is considered a significant problem, but with the efficient use of e- procurement, this issue may be minimized (DIFI Electronic procurement platform, 2015).

According to (Francesco, D´Angelo, and Valerio, n.d.), e-procurement measurement helps optimize public expenditure by increasing organizational performance. Their paper presents the model-mapping public procurement benefits that can be achieved by adopting e-procurement. Their theoretical model has been tested for four years and also applied to different contexts. The private sector had standardized electronic procurement many years ago. Research concerning issues, such as the measurement of benefits of e-procurement, value of e-procurement, and the adoption of e-procurement models, have been discussed in various studies. However, information regarding e-procurement in the public sector is limited. This paper aims to propose a suitable, practical, and customizable model that studies the impact of e-procurement in public units. Their model explains a measuring framework based on five impact dimensions: efficiency, effectiveness, competitiveness, dematerialization, and transparency. These dimensions symbolize the areas, which could benefit the most from e-procurement. The model is illustrated in Figure 3 E-procurement impacts.

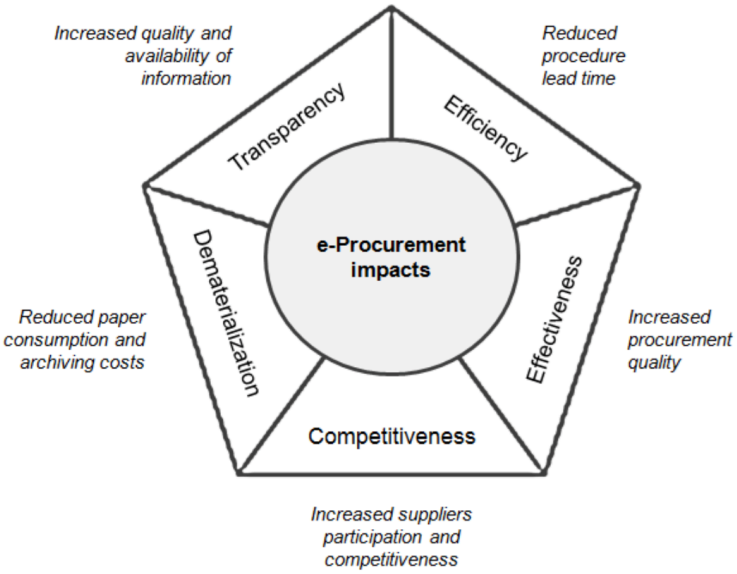

Figure 3 Copyright by: IPPA https://www.business.govt.nz/procurement/pdf-library/agencies/Guidetomeasuringprocurementsavings.pdf

2.3.3.1 Efficiency

Efficiency can be measured by expecting the employees to achieve at least the same results that are seen in traditional paper-based procedures. If e-procurement is to be considered beneficial, the lead-time should be significantly reduced because of the automation of procurement activities.

2.3.3.2 Effectiveness

One way of measuring the effectiveness of e-procurement is by calculating the average discount on the reserve price. E-procurement should provide discounts because of the access it has to larger markets and to use advanced instruments for negotiation, such as auctions. Another way of measuring effectiveness is by measuring what was achieved compared with how much HR. E-procurement required effort should enable more free time so that it can be used to study measuring, documentation, and strategy.

2.3.3.3 Dematerialization

In many offices of contracting authorities, there is a large quantity of documents lying piled up. Using e-procurement as an operational standard should significantly show a dramatic turnaround in paper use. This is because of the use of digital signatures and the digital exchange of documents on platforms. It is not only cost-efficient but also important for showing how other businesses should consider contributing to solve environmental issues. Suggested measuring methods may be to actually study how much digitalization is used internally for procurement. If other municipalities study the same activity, the possibility for benchmarking may occur. This gives good motivation to professionalize something that gives both economic and environmental benefits.

2.3.3.4 Transparency

Transparency assures the highest flow of information both inside and outside public authorities. E-procurement improves transparency by the automatic publishing of documentation and by using procedures, such as winning suppliers, ranking, and clarification request. This further gives the possibility of carrying out technical evaluation by using, for example, a tabular format showing specific scores of every technical alternative. Such processes can be quite costly and demanding to implement, but it represents a necessary transparency index.

2.3.3.5 Competitiveness

Since government spending is high and in a financial situation where even miniscule savings are significant, it is becoming more and more important to stimulate the highest level of market competition. E-procurement can contribute by ensuring higher level of supplier participating in procedures and using advanced and evaluated negotiation instruments, such as auction, to place pressure on suppliers. Benchmarking can help to press down prices and improve competitiveness by specifying what these municipalities charge for certain products and how their rates compare with others. Comparing public procurement units could trigger higher goals and influence competitiveness. This may give some interest to pressure suppliers for better prices and also actually purchase better quality products (Gardenal, D'Angelo, & Manzo, n.d.).

2.3.4 Summary of measuring enabling tools

The thesis has identified three central variables that enable the measuring of public purchases: standardized processes, competence, and e-procurement. Figure 4 shows the connection between the hypothesis and the variables, and how they further relate to efficient procurement measuring.

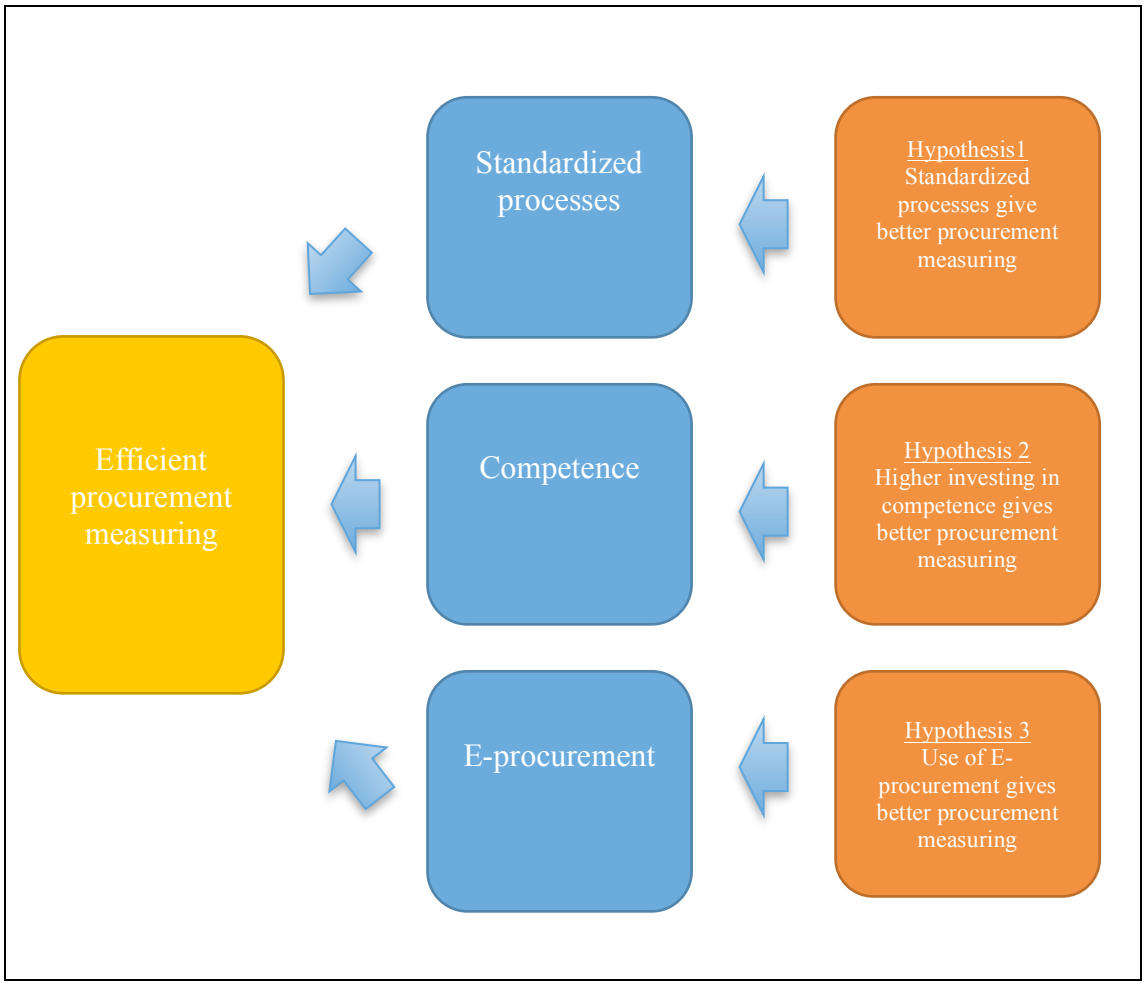

Figure 4: Literature summary

This master's thesis presents efficient public procurement measurement, which are defined by the following characteristics:

- **Standardized processes**. These are clear guidelines on how to measure using a structured purchasing process with established KPIs and innovative ICT support.

- **Competence**. This refers to having qualified staff to perform tasks that are needed to reach the desired measuring goals.
- **E-procurement**. This refers to the automated purchasing and collection of data throughout the procurement process; it shows results and defines whether purchases can be considered efficient or not.

To implement the earlier-defined tools that give necessary support for efficient procurement measuring, the following actions are to be considered:

1. Standardized processes enable procurement measuring in the following ways:
- Providing clear procurement processes that document each step.
- Enabling KPIs to provide commitment and goals for each purchase.
- Mapping software solution for each activity allowing statistical evaluation.

2. High competence enabling procurement measuring in the following ways:
- Staff the necessary course to perform the required measuring activity.
- Provide better agreements and deals for better measuring results.
- Provide better order and delivery evaluation for better measuring results.

3. Use e-procurement to enable measuring in the following ways:
- Automate the purchasing process
- Provide better access to data
- Organization, transmit, store, and act on information digitally

The three actions described give a clear definition for efficient public procurement, which further enables procurement measuring. Standardized purchasing processes give clear guidelines for how to perform public procurement. Without the competence, the managers will not be able to perform these tasks professionally. Without optimal use of e-procurement, it will not be possible to perform data collection and analysis in a cost-effective manner. To test these hypotheses, a survey was made to provide information regarding Norwegian municipalities and their use of these factors. The survey results will be compared with the dependent variable (measuring,) which will be used for testing how significant the correlation is between standardized processes, competence, and e-procurement for measuring performance.

2.4 GOALS & CONSIDERATIONS FOR EFFCICENT MEASURING

This section gives a flowing guideline how public municipalities can preform measurement efficiently. These measuring enabling tools mentioned above are quite dependent on the organizations intention to preform measuring; this intention could be introduced by considering the following literature.

2.4.1 Measuring governance

Measuring results of public procurement can contribute to the effective utilization of public funds and ensure that national and international laws are being followed. Support for (SIGMA,2011) is an initiative of the EU and OECD, which provides support and guidance on governance. In its guideline Sigma presented "why performance measurement of procurement is appropriate." It also discussed the challenges in performance measurement and how governments and purchasers can measure the effectiveness of procurement.

According to Sigma, effective public procurement can be discussed on three different levels: national, principal, and contract. Effective procurement involves benefits at all three levels.

National level

Benefits obtained at the national level include the following:

- Helps policymakers to understand the link between policy objectives and how the purchasing policy affects the achievement of procurement
- Makes it possible for the authorities to improve decision-making and set long-term goals for the development of regulations and framework for public procurement
- Provides authorities with stronger incentives to improve procurement systems, prioritize reforms for improvement, monitor progress, and compare progress with targets
- Obtains valuable information that can be used for assessing the budgeting of public expenditure

Contracting authority (Macro) Level

Benefits obtained at macro-level contracting include the following:

- Provides information that can determine the extent of large projects and the overall effectiveness of procurements
- Identifies strengths and weaknesses in procedures for procurement, monitors trends over time, and provides a basis for prioritizing improvements in the right areas
- Ensures that improvement of contracts should be an integral part of the budget processes, management strategies, and employee development
-

Contract management (Micro) level

Benefits obtained at micro-level contracting include the following:

- Provides incentives for better compliance with the contract requirements contracts
- Considers whether a contract is effective and provides value for money
- Obtains an overview of the degree of effective planning and implementation of each contract; for example, in terms of specifications with technical specifications, selection of contract types, the choice of the procurement process, selection of eligibility standards, and the evaluation of the offers
- Provides good arguments and incentives for change and improvement of the entire procurement process
- Uses benchmarking in performance measurement so that the companies can assess their own performance against other comparable purchases of comparable goods and services (SIGMA, 2011, 1–4)

Sigma also pointed out that it could be challenging to design and follow up a goal and performance management system where performance measurement is effective. It describes some common challenges for performance measurement systems at the national level, for employers, and for the purchasers who design contracts:

- Consistent goals. Changes in targets for acquisitions may impose restrictions on maximizing economic benefits derived from acquisitions.
- Correct statistical information. Results measurement and management requires relevant, useful data of good quality.

- Definition and measurement of efficiency. Efficiency can be measured in different ways, and the term should be defined clearly in a way that is relevant to its context.
- A culture that focuses on performance measurement. It is important to pay attention to how regulatory and institutional mechanisms underpin performance measurement.
- Support and guidance. Guidance and support from business and management from central government will be essential for good performance measurement. It may, therefore, be appropriate for professional support within the organization, for the system design, for performance measurement at the national level, and for the national information campaigns about procurement.
- Available information. Information on procurements should be made available to businesses for facilitating comparing itself with other businesses and conducting benchmarking. The information can be presented annually in public reports that describe the particular strengths and weaknesses of the procedures for public procurement and recommend measures to improve the system.

Nationally, public procurement is measured by evaluations, investigations, and reviews. For principals, it would be an advantage to have good methods to measure performance when buying goods and services. Potential practices could be setting performance targets and comparing the effectiveness when similar goods and services are being purchased in different businesses. Such knowledge can be a valuable input when the authorities calculate budget savings. The measurement of each contract may involve the management of deliveries, nurturing relationships, and management contracts (Sigma 2011). My impression is that the challenges specified in Sigma (2011) also apply to purchases in Norway. Previous literature shows that purchasers within the public sector have a need for more and better information about their purchases; therefore, they experience the challenges referred to in Sigma as relevant (SIGMA, 2011, 4–6).

Ideally, one should seek to measure the effects purchases have had on the entire objectives behind each purchase. If we use purchasing of face creams as an example, it should ideally be evaluated in the light of what the face cream has cost and what effect the face cream has had on patient care and the patients' health situation. One should also compare one cheap face cream with an expensive one. If the cheap face cream gives higher infection than the expensive one and thus has a greater degree of morbidity for patients, then we need to have

an economic evaluation of the cost of this morbidity. Then, it may be efficient to use resources to buy the expensive facemasks.

In reality, often the relationship between the purchasing individual and the achievement of the business purpose is so indirect that it makes no sense to measure the effective use of resources in this way. Then, it is probably more appropriate and considerably easier to measure the effective use of resources in the cost of an input factor in a given period or the cost of a given amount of input factor. If a business from one year to another reduces the cost of printer ink, it may be because the cost per unit of printer ink is reduced or because there is a new type of ink that has better quality and uses less ink per printed page. Both these cases imply that the purchasing department has done a good job ensuring the goal of efficient use of resources when it comes to printer ink. However, it can also be considered that the reduction in expenses simply comes from the fact that they print out less pages than before. Therefore, we see that neither one of these measurements on this simple level has 100% accuracy. We could measure the average price per printer ink unit and see how this price changes from one year to the next; however, then the quality changes would not be captured. The ideal goal of the efficient use of resources within this particular category will probably be the total cost of printer ink divided by the number of printed pages. If this ratio is reduced from one period to another, it can hardly indicate anything other than increased efficiency in resources used on the site. It would be appropriate to establish targets that are not perfect, but are at a level that allows them to provide significant indications of efficiency developments while being easy to implement. These are comparable across businesses using readily available and good data. In my view, it is possible to establish such measures. These measures will largely be based on available account figures.

2.4.2 Measuring suggestions for the effective use of resources

Oslo Economics have proposed seven specific units of data that are designed for the efficient use of resources by government institutions. Some municipalities have already good access to several of these data sets, while others do not have good access (at least not in electronic, automated form). The seven factors are as follows:

1. Cost per account compared to last year's budget. (Are there any categories where costs seem to increase much? What is the reason for this? Can the purchasing department take steps to change the picture?)
2. Cost per employee per account. (Are there any categories where our business seems to have too high costs compared to other businesses?)
3. Cost related to purchasing activities. (How effective is the purchasing department compared with other departments?)
4. Delivery and competition register. (What activities are on schedule next period? How many competitions will be implemented this year? Are vendors followed up as they should, and are there strict agreements?)
5. General overview of vendors with agreement coverage. (Is it easy for providers to have relatively high turnover but low agreement coverage? Can we then assume we need new agreements? Is the change of the main supplier of individual categories over time, unless it is perhaps time for a competition?)
6. Agreement share per account. (Is there a category where agreement coverage should have been higher? How is the trend over time? Is the loyalty of existing agreements good? Have other businesses greater agreement coverage than us on some categories?)
7. Price per item number. (Are all product bought for the same price? Have prices of individual articles risen sharply over time? Do other government agencies have better prices than us?)

(Oslo Economics, 2013)

Higher-level controller is typically organized by the CPO and in meetings between the purchasing and company manager. At this meeting, they discuss the overall goals of the efficient use of resources and the achievement of objectives for these goals. Some of these targets and associated achievement may also be relevant for the business manager to use in the management dialogue with the ministry.

Micromanagement takes place internally within the purchasing organization; it is meant to get the best possible workflow with the optimal utilization of available resources. Here, we are talking about tools that make the whole purchasing organization able to conduct category management and make plans for new areas that may be relevant for competition. Oslo Economics enumerated the relevant contents of each of the seven data sets.

Cost per account compared with last year and the budget. If a company's cost of a financial account has risen significantly from the same period the year before, this may be an indication of inefficient use of resources. If the cost, despite the increase from last year is still within the budget, it would be likely that it is making changes to the way of working or delivery volumes that are causing the increase in costs. Also, a cost increase that is a budget overrun may be due to underlying purposes that are beyond the purchasing department's control (such as increased exogenous market). However, all these cost increases will at least be a good starting point to ask for a detailed account of those responsible for the area.

Cost per employee per account (for individual accounts). Certain types of costs, such as the cost of office space, will largely correlate with the number of employees in businesses. It will thus be interesting to compare the cost of office space (rent, electricity, janitorial services, etc.) per employee across state agencies. Those businesses that have a high cost per employee in this area probably have a reason to consider whether resource utilization could have been more effective. This may also apply for cost types, such as supplies, canteen, furniture/fixtures, and courses/conferences. It may also apply to a certain extent to cost types such as ICT (especially for businesses that do not have a large degree of self-developed legacy system serving large populations) and travel/transport (especially for businesses that do not largely impose international activity).

Agreement share per account and overall. It is common to assume that the use of resources by purchasing is more efficient when one goes over from making individual purchases to publicly available rates to enter into special agreements with specific products at discounted prices. This is not a necessary connection because transaction costs of sourcing and contract follow-up may exceed the savings resulting from the price reduction. However, monitoring a target figure will tell us how much of the purchases were made through its agreements. This data may be interesting per account and also as a proportion of the total expenditure per labor costs. Here, we can follow the measure over time for a business to see if the agreement percentage is increasing, and then we can compare the value between companies.

Cost related to purchasing activities. Work regarding purchasing may itself be more or less effective. Each procurement organization should evaluate its own effectiveness. Comparing the cost associated with purchasing activities across businesses can do this. A good key figure here may be the cost related to purchasing activities as a proportion of the total turnover related to agreements. The purchase costs should include labor costs, any consultant costs, and any ICT costs of procurement systems.

Overview of vendors with agreement coverage. An additional tool to identify areas where there probably is potential for more efficient use of resources is a report showing all suppliers to a business, sorted from largest to smallest (by revenue) and the specified share agreement covering the last period. Individual enterprises might want to engage in dialogue with suppliers with high turnover and low contract coverage; they might want to enter into agreements that provide more efficient use of resources. For the state overall, such an overview at the state level will help capture suppliers that may not be very large for individual companies, but are major suppliers to the state overall. Then, it might be appropriate to enter into a common state agreement with this supplier.

Price per article number. For purchasing, the department's efforts to identify new areas where it is possible to rationalize the use of resources through the signing of new agreements will be very advantageous if there is easy access to all historic transactions at the article level. Then, you can determine whether different parts of the business are paying different prices for the same item, and they can reveal the prices of individual articles, which have risen disproportionately over time. If we have access to other

transactions of government institutions at this level of detail, we can see if others have achieved lower rates.

Supplier agreement and competitive registry. In order to get good control of processes in the purchasing department, it is important to have easy access to all existing agreements, make good plans for upcoming competitions, and have a good index of all suppliers who at some point have had a relationship with the business. With a sensible electronic system, all these data can be gathered in one place. It provides opportunities for functions such as calendar, contacts data repository, and supplier monitoring registry, and appointment records. Overall data with associated functionality may have limited use for small businesses with very few agreements. For larger businesses, such a system will ensure predictability and order and enable the effective use of resources within the organization (Oslo Economic, 2013).

2.4.3 Guide for measuring savings and benefits

In cooperation with the procurement development technical advisory group and a specialist advisor, (New Zealand Government, 2011) has provided a guide for measuring procurement savings and benefits. The guide is a part of a government initiative to help suppliers in the public sector to better engage and support good procurement practices. Together, they developed a five-step process that is suited to measure the savings and benefits of tactical procurement activities at lower expenditure and lower risk. This process is a response to the needs of all government agencies. By using this process, they will be able to collectively quantify and track their contracts, financial savings, and other benefits.

When measuring the saving and benefits of a procurement activity, it is important to separate their sources and their impact. The savings and benefits that result from a procurement activity are usually the result of an improved deal, efficiency improvement, or a combination of the two. An important fact that managers should consider is to be careful not to claim saving/benefits that do not have any impact and relationship with their procurement activities. An example given by the New Zealand Government states the following:

> "A reduction in travel expenditure for example could derive entirely from a video-conferencing procurement activity, or be partly the result of a redistribution of staffing across offices, which happened at about the same time, provide an example of this. In the latter case, only the savings/benefits from the video-conferencing would count. "

The impact of savings and benefits are divided in two:

1. Budgetary benefits come from factors, such as price reduction, or other factors that release cash or budget for reallocation.
2. Non-budgetary benefits are benefits that are non-cashable, such as cost avoidance.

It is important to differentiate between these two and how they have been derived. Some may be the result of good procurement practices while others may occur because of change in business practices that the new product has given rise to. Measuring process is illustrated in figure 5 below:

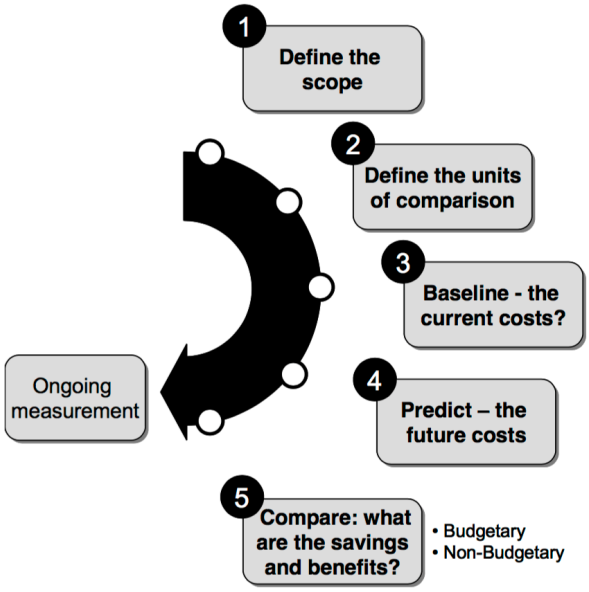

Figure 5: Copyright 2011 by: New Zealand Government https://www.business.govt.nz/procurement/pdflibrary/agencies/Guidetomeasuringprocurementsavings.pdf

Before using this measuring process, it is important to map and determine if the saving and benefits are non-budgetary or budgetary.

Step 1. Define the scope

In this step, the organization needs to work on defining their procurement activity and the related savings and benefits that need to be measured. It is important to gather all the subcategories that may be connected to the savings and benefits and divide them into "baskets" of related items. Further, cost components that could be influenced by the product/service selection needs to be included. If other services are involved, it is necessary to ensure that their cost does not offset any agreed cost reduction. Managers conducting this process need to be careful with "leakage," which is defined, as the spending that should be connected to the contract scope; instead, it can be referred to as a "specified purchase" and therefore discounted from the scope. The consequence of this may lead to lower potential savings because the aggregated contract was not used.

Step 2. Define the comparison units

At this stage, the organization needs to calculate the savings and benefits of the procurement activity and define techniques for comparing the current predicted costs. Better and clearer definition of these costs lead to a better baseline for comparison.

Step 3. Baseline of the current cost

This stage is considered one of the most important because the outcome will have a major influence on the total process result. By using the comparison from Step 2 in figure 5, the managers can quantify the current situation. For this step, it is crucial to remember to divide the capital and operating costs when evaluating the baseline spend. It is also crucial to start collecting information about the non-budgetary benefits that will be discussed in the last step of the process.

The New Zealand government provides an example of base lining the current cost:

> "The agencies' call center staff purchases totaled $252,450 in the previous financial year. The hourly rate ranged from $25 to $40, with an average of $33 per hour. The current average training time is half a day per temp. Training is done by staff members, which creates a service hole that doesn't get filled until half-way through the day."

It is vital not to forget all the main expenses associated with the product/service that is sourced. Factors beyond the preliminary value of purchase will consist of related services, transport, and disposal expenses. If it is appropriate, a detailed evaluation can be undertaken of the entire cost of ownership.

Step 4. Predict the future cost

At this stage, data collected from Step 3 is used to determine studied spending's under the proposed procurement agreement. At this step, it is important to consider any changes that may be applied under the new agreement. Some relevant factors are stated as follows:

- New categories or components
- Lower or higher level of service
- Different consumption levels, any changes in consumption should not be considered in the savings
- Different products and services

Further, it is important to keep working by detecting the non-budgetary benefits applied in Step 5 and also considering the differences between the capital and operational costs.

If appropriate, managers may adjust for inflation. The New Zealand Government states the following:

> "If a contractual term is longer than a year, you could use CPI or another relevant index adjustment to calculate the out-years, offset by any inflationary price increases agreed during the contract's term. If the contract simply specifies adjustments aligned to CPI, the inflationary distortion is zero."

Cost only needs to be inflated if the cost of a product or service is based on the previous year's purchase. If it is based on the current year, there is no need for adjustments. However, it is important to note that it might be necessary to inflate costs in future years if prices have not been indexed and fluctuations are likely.

Step 5. Compare savings and other benefits

At this last stage, the managers calculate the predicted savings by considering the before and after differences. This is followed by an evaluation of all other benefits of the procurement activity. A simple way to calculate the procurement activity is given below:

Current baseline (*volume x unit cost*) – predicted spend following procurement (*volume x unit cost*) = Realized savings.

(New Zealand Government 2010**)**

CHAPTER 3

RESEARCH METHODOLOGY

3. INTRODUCTION

This chapter describes the research design and methodology used in this study. We will discuss the design, target audience, data collection instruments, data collection procedures, and data analysis procedures. To connect efficient public procurement measuring with good tools that give the necessary support, the following methodology and hypothesis was used.

3.1 APPROACH DESIGN

This thesis focused on using both the explorative and descriptive designs in order to understand issues regarding procurement measuring within Norwegian municipalities. The study design involves a description of how the whole analysis process will be set up to solve the questions related to the thesis. Explorative design will be presented by conducting individual interviews, which are appropriate when the individual's personal experience is of interest. This means that open questions were given so that the respondents could freely express their opinions regarding the topic.

A descriptive design was created through surveys with standardized communication between interviewers and respondents. Every respondent was asked the same question in the given order. The results from the interviews were used for further discussion and to form a conclusion of this thesis. Answers from the surveys will be tested in SPSS to define the significance level of three hypotheses (Gripsrud, Olsson, & Silkoset 2010, 38).

3.3 QUANTITATIVE AND QUALITATIVE RESEARCH

Quantitative research methods are characterized by a collection of information, which can be analyzed numerically; its results are typically presented using statistics, tables, and graphs. Qualitative research is by definition exploratory. It is used when we do not know what to expect, how to define the issues, or lack an understanding of why and how affected populations are impacted by an emergency. Qualitative data like quantitative data is based on empirical investigation and evidence. However, qualitative research explores information from the perspective of both groups and individuals and generates case studies and summaries rather than create lists of numerical data. In this thesis, I used interviews to define the main problem areas in Norwegian municipality procurement and further used this information to adjust hypothesis and questions for surveys. The answers from the surveys are tested in a linear regression analysis done in SPSS (ACAPS, 2012).

3.3.1 Interviews

According to (Toft Mogstad,n.d) an in-depth interview is a freer conversation when following specific themes. The choice between structured interviews or in-depth interviews depends on the topics you want to record and the type of information you want. The author Live Marie further points out that in-depth interviews are time and resource consuming. It takes a long time to implement them and the information obtained must be interpreted and processed. It also requires trained interviewers to ensure that interviews provide valid answers.

However, it is possible to obtain valuable information using this method. For example, we can ask about attitudes and opinions and get specific answers. In addition, during in-depth interviews, like other personal interviews, the questioner can interpret the respondent's body language and other non-verbal communication
(Toft Mogstad.n.d.)

3.3.2 Questionnaire surveys

Questionnaire survey is used to measure the value of the variables that can be derived by analyzing the purpose and survey questions. What matters is that through the use of survey, we get reliability in conjunction with measuring and reviewing the main sources of error we face. The survey forms will be completed and returned online by respondents. Using surveys is an inexpensive method to obtain larger data volumes at minimal costs. Coupled with the usability of technologies to automatically compute the survey outcome, it will be easier to analyse and compile reports on public procurement processes. The developed survey is an instrument to collect information that enables communication between the interviewer and respondents being standardized. All respondents are asked the same questions in the same order. This method is used to cover the number of respondents that were not included in the interview. Because the survey is standardized, it makes it easier to compare respondents' answers. The service was made in Questback and sent out to respondents on e-mail (Gripsrud, Olson, & Silkoset 2010, 94).

3.3.3 Data sample size

Individual interviews

I visited five municipalities where I spoke to five different procurement managers. The selection of municipalities for interview was based on their size and budgetary allocations. To get a comprehensive result of the interview, I chose to visit municipalities that have significant differences in size and economy. In this way, I was able to analyze the working environment and different challenges considering procurement in the public sector.

Surveys

To answer the proposed problem statement of this thesis, I had to include respondents who had reliable knowledge and required working experience with public procurement. My respondent group consisted of staff members from the Norwegian municipality procurement sector. All of them purchased goods and services on behalf of the countries' municipalities on a day-to-day basis.

According to (Store Norske leksikon, 2016), there are 428 municipalities in Norway. In recent years, the Norwegian state has made changes and combined many purchasing units. As a result of this, many small municipalities today do not conduct purchasing and are therefore not considered relevant respondents. Because of limited access to data, I was not able to map out who performs and who does not perform purchasing functions. However, since the largest municipalities are generally those who perform purchasing functions, I concentrated on the municipalities that have more than 15,000 residents. Many of the municipalities with less than 15,000 people have their purchasing units combined with other larger sectors.

Today, there are 80 municipalities in Norway that have more than 15,000 residents and those are my target groups. I contacted managers and staff members within the procurement department who answered their surveys through e-mail. My respondent rate was 49, which is 61.25%.

3.3.4 Designing interview questions

The main objective behind the interview was to gain some knowledge about procurement in the Norwegian public sector; my focus was on measuring purchases. This information will be used in the discussion part of the thesis. The interview results also gave interesting inputs when developing the survey questions by identifying the key challenges faced by Norway municipalities. For constructing and conducting the interview, I used (Harvard, n.d.) PowerPoint presentation. The main points of this are given in figure 6:

Questions of a good interviewer	Question design
1. **Knowledgeable:** is thoroughly familiar with the focus of the interview; pilot interviews of the kind used in survey interviewing can be useful here. 2. **Structuring**: gives purpose to the interview; rounds it off; asks whether interviewee has questions. 3. **Clear:** asks simple, easy, short questions; no jargon. 4. **Gentle**: lets people finish; gives them time to think; tolerates pauses. 5. **Sensitive:** listens attentively to what is said and how it is said; is empathetic in dealing with the interviewee. 6. **Open:** responds to what is important to interviewees and is flexible. 7. **Steering**: knows what he/she wants to find out. 8. **Critical:** is prepared to challenge what is said, for example, dealing with inconsistencies in interviewees' replies. 9. **Remembering**: relates what is said to what has previously been said. 10. **Interpreting:** clarifies and extends meanings of interviewees' statements, but without imposing meaning on them. 11. **Ethically sensitive:** is sensitive to the ethical dimension of interviewing, ensuring the interviewee appreciates what the research is about, its purposes, and that his or her answers will be treated confidentially.	1. **Direct questions:** "Do you find it easy to keep smiling when serving customers?"; "Are you happy with the way you and your husband decide how money should be spent?" Such questions are perhaps best left until towards the end of the interview, in order not to influence the direction of the interview too much. 2. **Indirect questions**: "What do most people round here think of the ways that management treats its staff?"; perhaps follow this up by "Is that the way you feel too?". This will give the individual's own views. 3. **Structuring questions**: "I would now like to move on to a different topic." 4. **Specific questions**: "What did you do then?"; "How did X react to what you said?" 5. **Interpreting questions**: "Do you mean that your leadership role has had to change from one of encouraging others to a more direct one?"; "Is it fair to say that what you are suggesting is that you don't mind being friendly towards customers most of the time, but when they are unpleasant or demanding you find it more difficult?

Figure 6: Interview questions

3.3.5 Designing surveys questions

When making theses interview questions, response error was a central consideration. According to (Gripsrud, Henning Olsson & Silkoset 2010, 115-121) there are three main considerations to reflect on when designing surveys. Authors suggested that first of all we must ensure that we are providing questions that the respondent can and will answer. Second, they suggested varying the format of questions to motivate respondents. Finally, they proposed increasing clarity to minimize response errors. For ensuring that these three considerations are included, the following outline was used:

1) **Definition of goals and objectives**. The main purpose of the survey was to identify the current situation and status of measuring performance in public procurement in Norwegian municipalities. The questions were based on the answers collected in the interviews and research objectives.
2) **Design of the questionnaires**. My first consideration was to simplify cognitive weight and use short, easily understandable questions. That is the reason I used only 13 questions. I have also varied the questions in order to make it more interesting.
3) **Testing the questions**. I tested the questions in order to identify any unclear writing and poorly designed questions and options by obtaining e-mail feedback from my former postgraduate students and managers.

Designs for the questionnaires were based on ordinal and ratio data**. Ordinal** scales provide good information about the *order* of choices, such as in a customer satisfaction survey. **Ratio** scales give us the *ability to calculate ratios* since a "true zero" can be defined. I sent 80 emails to different procurement sectors of municipalities to participate in the surveys. I wrote an introduction on the first page of the survey. The introduction described the problem statement behind the thesis and the objectives behind the survey. At the end of the definition, the answers are given as options. It was written in such a way that question one comes on a scale from 1-5, where 1 is the lowest and 5 is the highest value. Further, the rest of the questions are divided into "small scale, some scale, and large scale" alternatives. Small scale was defined as the lowest value that shows little or no use of the questioned activity. Some scale shows the middle value where respondents are familiar with the activity but could/should use it more. Large scale is the highest value where

respondents are quite familiar with using the mentioned activity and consider it an essential part of their working instructions.
Invitations were send to their personal email ids that I collected through telephonic conversations with each and every one of the respondents. Another reminder was sent out to those who had not responded within a week. The response rate was 61.25%. This will be used as a quantitative indicator for linear regression analysis in SPSS.

3.3.6 Analysis of research tools

The tools selected for this study were questionnaires, interviews, and case studies. The selection was based on "what combination could give the most information and data." However, selecting all three tools was not easy because public municipalities had difficulty providing information because of confidentiality issues. Therefore, this thesis presents information collected from 49 survey respondents and five interviews. Collecting the right amount of information was an issue because of the limited time frame and difficulties in finding voluntary respondents and interview subjects.

The main reason for choosing an individual interview is because the method allows explanations for complex questions. Interviews are generally longer, which in this case is both positive and challenging; however, this gave me the opportunity to adjust the questions and obtain a more comprehensive answer. Open questions are more flexible because the respondents do not write down anything. During the interviews, I could pick up non-verbal clues that indicated what was relevant to the interviewees and how they responded to different questions. In this way, I could control the context and ensure that we do not move outside the objective frame. There were, however, some challenges related to this method that I had to consider. First of all, interviewing is a time-consuming method. At the same time, it is important to understand the standing of the interviewer role and that it can affect the reliability of a response.

The interview covered only five municipalities; therefore, I used the questionnaire survey mainly to cover a larger geographical area in a short while. Surveys also cover the disadvantages of the interview method, such as errors caused by the characteristics of the interviewer and the variability in interviewers' skills. Public procurement is quite a sensitive topic; therefore, the survey provides greater anonymity for the respondent. However, it is important to consider the disadvantages, such as a lack of control on who is

filling out the form and how they are filling out the questions. The response rate can often be too low, and it can be challenging to know the characteristics of those who have not filled in the survey. My biggest challenges did not know how their non-response would affect the findings.

CHAPTER 4

SUVEYS RESULTS

4. INTRODUCTION

Information was collected from 49 managers and staff members working in the public procurement sector. Their information and e-mail ids were given to me during a phone conversation; therefore, I was able to ensure that only qualified respondents received the survey. My interview and literature result showed that standardized processes, competence, and the use of e-procurement are central tools to perform efficient measuring. Therefore, they also have an influential role on the design of the survey questions. The results will be presented using each of the three tools mentioned above to provide the reader a clear structure and perspective. Graphs from Questback will be used to describe the response rate.

4.1 STANDARDIZED PROCESSES

In the surveys, question numbers 2, 3, and 6 were designed to gain more knowledge about the public sector standardized processes. The definition of how standardized processes influence measuring is described in the literature review section of this thesis. These questions will throw light on how much Norwegian municipalities use these significant elements enabling procurement measuring.

Question 2. Does the municipality analyze its supplier market?

Question 2 is quite central for investigating how much knowledge the municipalities have about their suppliers. DIFI points out that during procurement and design of a procurement process and KPIs, municipalities should consider using the Kraljic Matrix or other relevant theoretical approaches to gain knowledge about their suppliers. Knowledge about the supplier and the supplier's market is central when designing result-oriented KPIs. Figure 7 illustrates that none of the municipalities participating in the surveys analyzed their suppliers on large scale alternatives; 58,3% analyzed them on some scale alternatives; and 41,7% analyzed them in small scale alternatives.

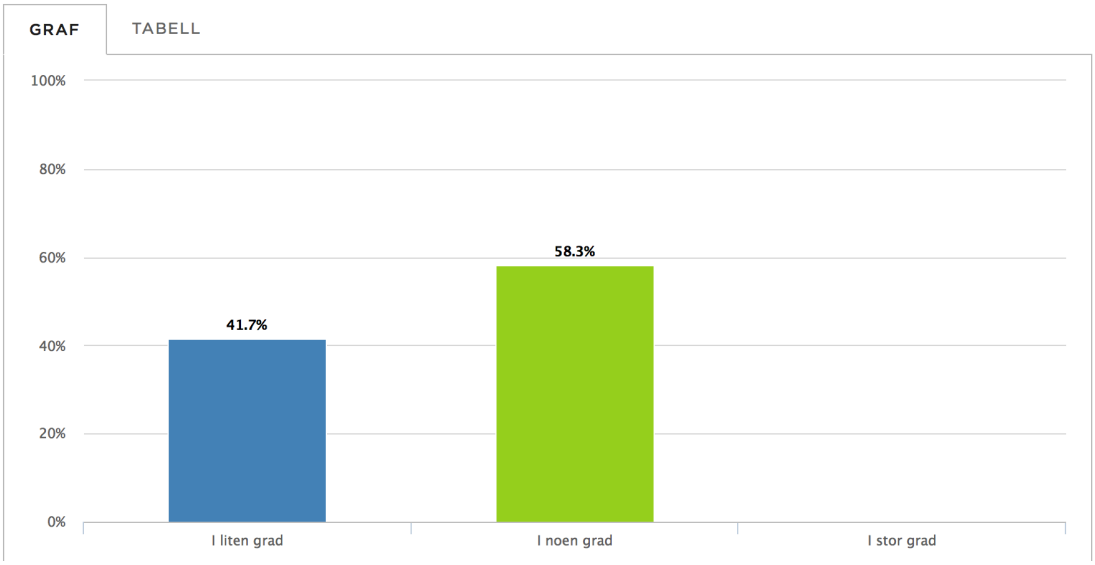

Figure 7 Copyrights by Questback

Question 3. Does the municipality have any purchasing strategies?

Question 3 was developed to investigate how much each municipality focuses on establishing purchasing strategies. Such strategies are quite significant for accomplishing an efficient purchasing process, and they may contribute to more efficient use of resources. Figure 8 illustrates that 33,3% of the respondents practiced it on a large scale; 45.8% practiced it in some scale; and 20.8% practiced it in small scale.

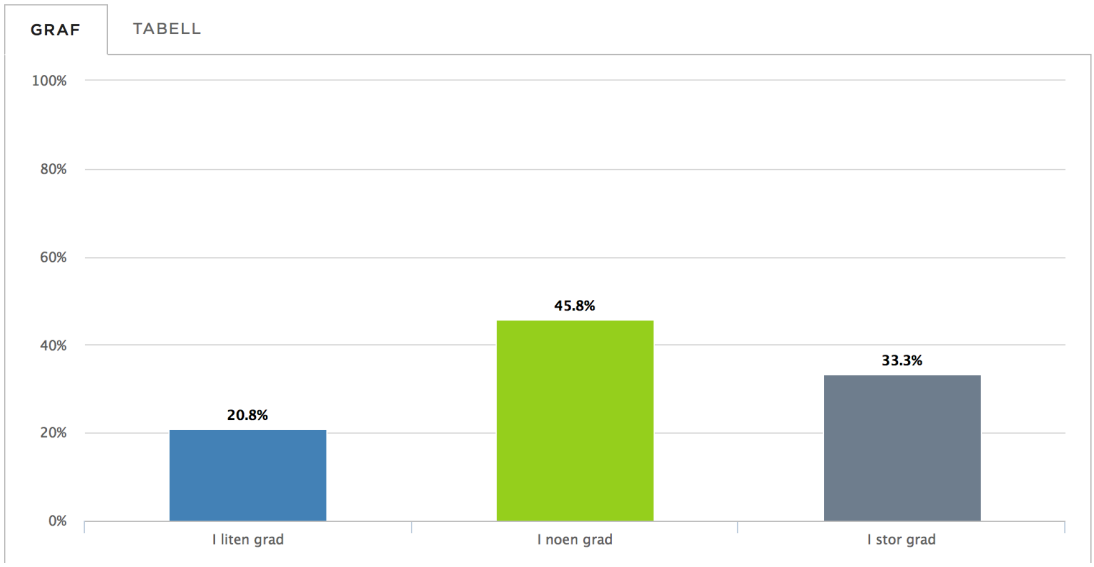

Figure 8 Copyrights by Questback

Question 6. Does the municipality have any established KPIs for result-oriented measuring?

Establishing KPIs is intended to work as a support/guidance for following up and measuring the results of procurements and supplies. To determine if a procurement process is efficient and if municipalities are measuring-oriented, we need to establish goals and KPIs behind each purchase. Figure 8 illustrates that 12.5% respondents established KPIs on a large scale; 45.8% established them in some scale; and 41.7% only established them in small scale.

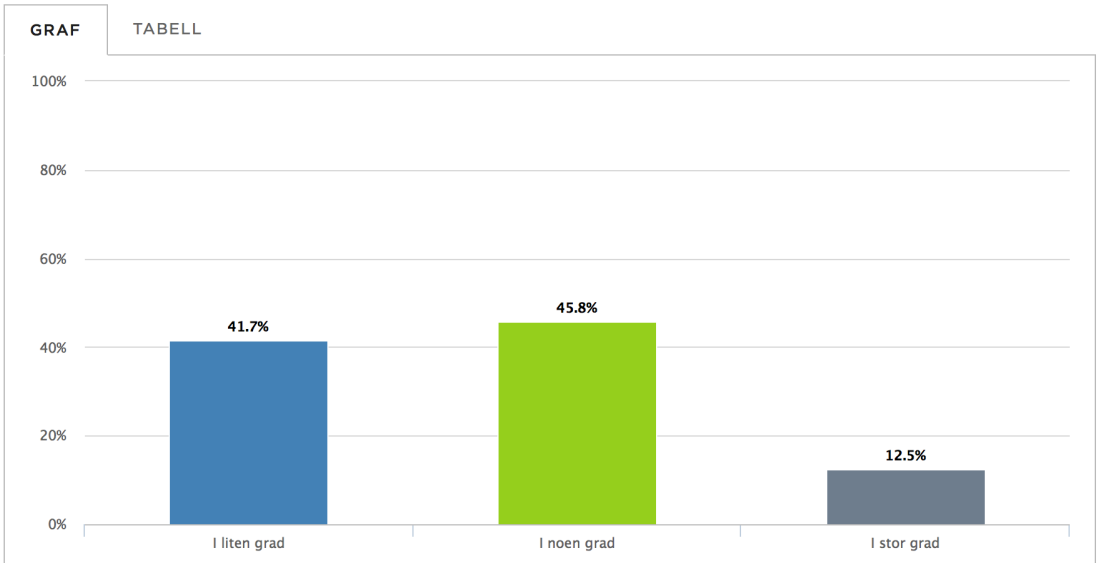

Figure 9 Copyrights by Questback

4.2 COMPETENCE

A lack of professionalism and the use of expertise in procurement processes contribute to a variety of losses. Menon pointed out the importance of higher competence in the public sector and estimated that the state and municipalities can save about 10–15%, corresponding to 20–10 billion NOK annually by professionalizing the procurement process. The question regarding competency is Question 4. For ensure that municipalities practice measuring more frequently, staff needs to have the required competence.

Question 4. Do the municipalities invest in higher competencies?

Because of the significant role competencies play in public procurement, I have chosen to investigate how much each of the respondents actually invests. Figure 10 illustrates that 30.6% invest on a large scale; 59.2% invest in some scale; and 10.2% invest in small scale.

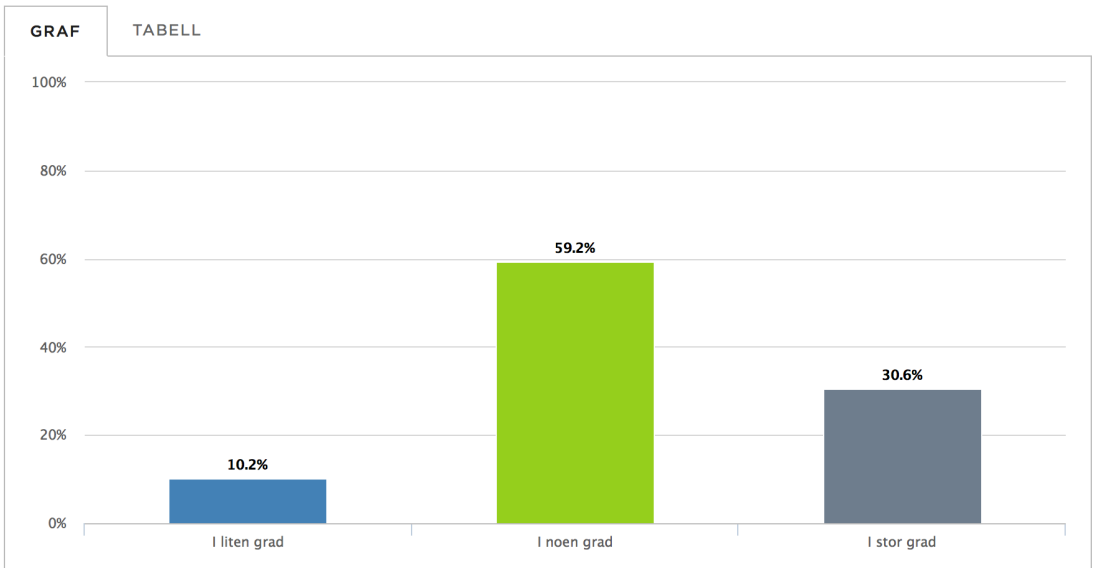

Figure 10 Copyrights by Questback

4.3 E-PROCUREMENT

Particularly, e-procurement has emerged as a vital part of the economy, and its benefits have been found to guarantee efficient reductions in cost and the time taken to conduct a public procurement process. Using e-procurement is a transparent and convenient way to guarantee a competitive tendering process.

Question 9. Does the municipality perform benchmarking?

Using e-procurement for purchasing could enable more measuring and comparing possibilities by providing more data during the purchasing process. An efficient way to measure results is by comparing them to a standard; therefore, it is essential to focus on how much Norwegian municipalities use benchmarking. Figure 11 illustrates that the respondents perform benchmarking equally at 33.3% in large, some, and small scales.

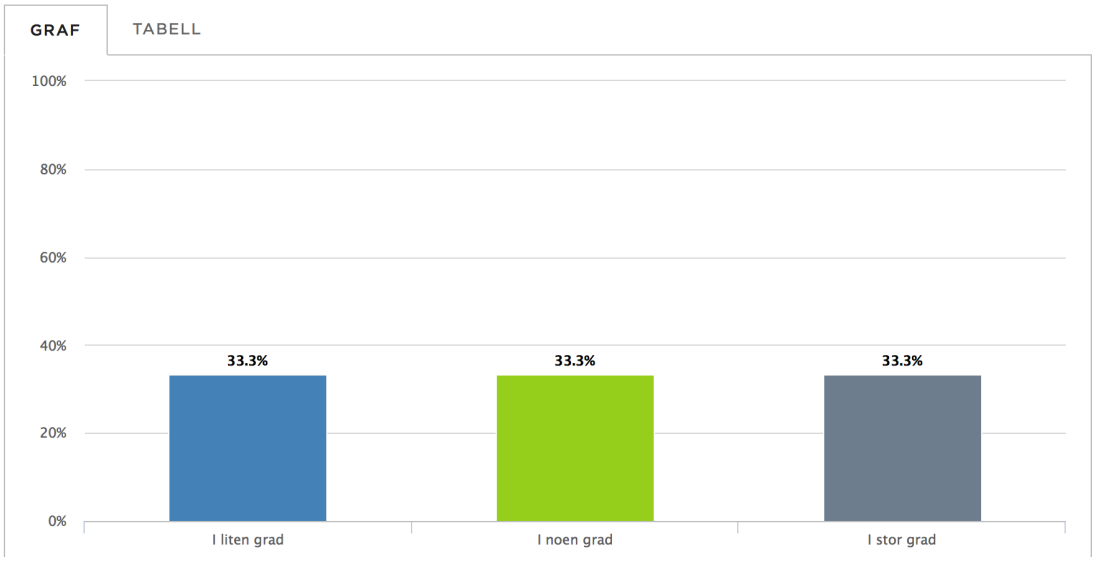

Figure 11 Copyrights by Questback

Question 10. Are manual purchasing processes practiced?

Svidronova and Mikus (2015) showed that IT usability has played an influential role in streamlining the performance of the public procurement sector. Moreover, coupled with the reforms of the government and the public administration sector, most of the innovations in public procurement are driven by ICT. Automated purchasing by using e-procurement has been a significant tool for data collection, cost savings, and measuring. Implementation of this tool in the Norwegian municipalities varies quite a lot; therefore, it is interesting to investigate how many municipalities still practice manual purchasing

processes. The graph shows that 12.5% use it in small scale; 52.3% use it in some scale; while 34.4% use it in large scale.

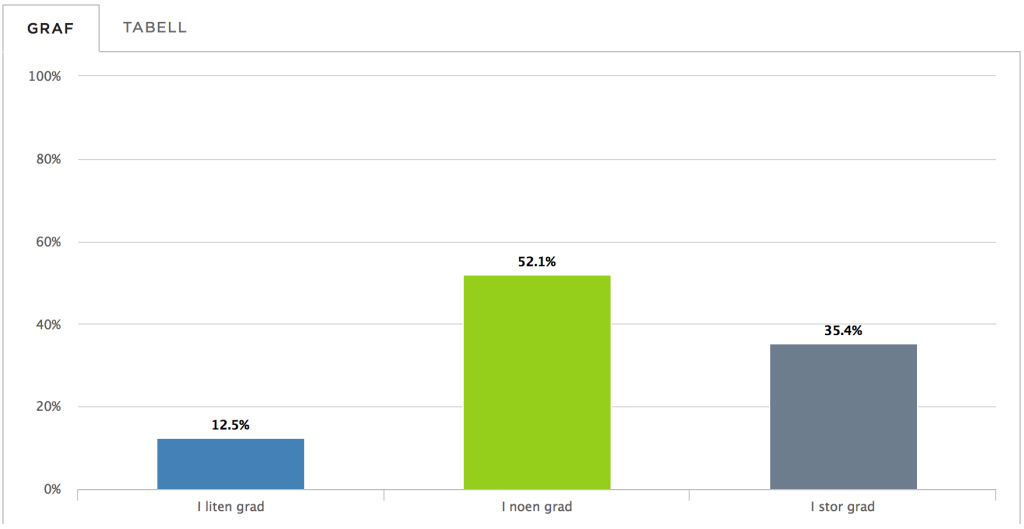

Figure 12 Copyrights by Questback

Question 11. In what scale does the municipality use e-procurement for purchasing?

In the literature review and during the interviews, it was mentioned that e-procurement has a noteworthy role for conducting efficient public procurement measuring. The implementation phase of this tool requires a lot of time; therefore, we investigated where the different municipalities were in their implementation stage. Figure 13 shows that 24.5% of the municipalities participating in the surveys use it in large scale for purchasing; 51% use it in some scale; while 24.5% use it only in small scale.

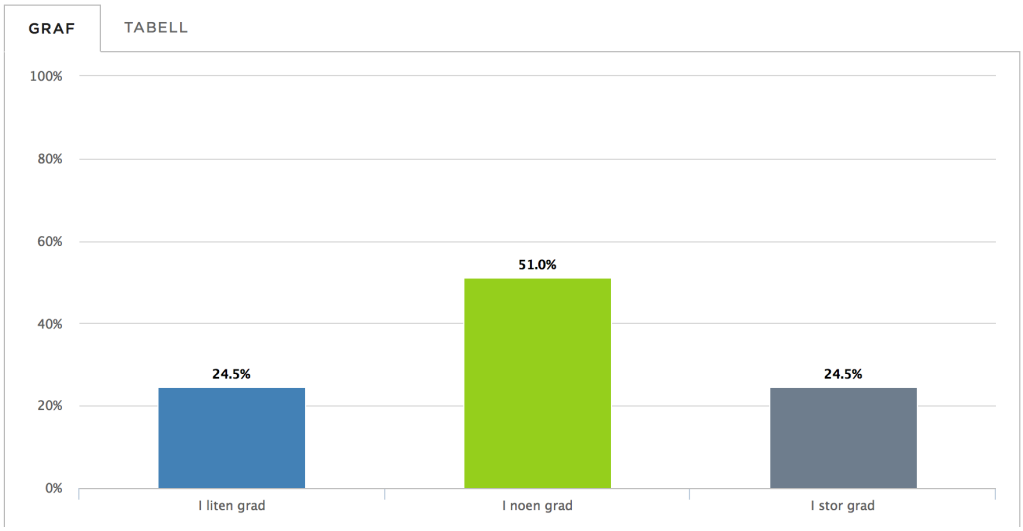

Figure 13 Copyrights by Questback

Question 12. Does the municipality need more management data?

Efficient measuring of public procurement is quite dependent on data availability; therefore, it is interesting to see what personnel of the public procurement sector consider this matter and whether they have need for more. These answers can show whether the data collection tools are used efficiently and whether there is a large difference in data availability from one municipality to another. Figure 14 shows that 45.8% of the municipalities need more data in the large scale; 50% feel that they need it in some scale; and only 4.2% feel that they need additional data in small scale.

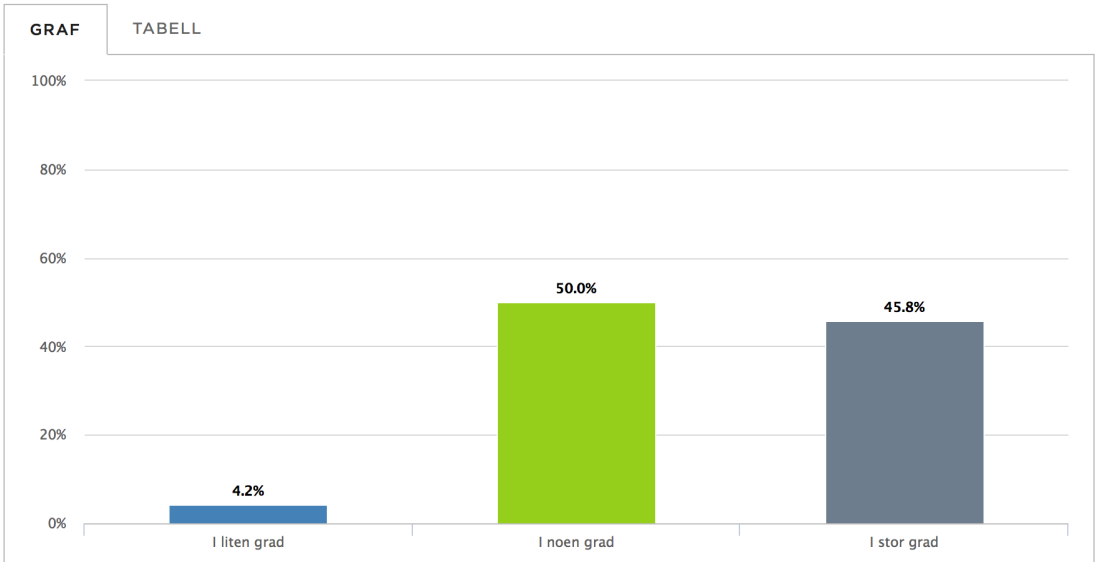

Figure 14 Copyrights by Questback

Question 13

To further investigate results from Question 12, I asked an additional question to identify the availability of specific measuring data. The question investigates municipality's data availability in electronic form available within the organization and in standardized form within the organization and standardized within the state. The results show that most municipalities have data available electronically within the organization, a small number of them have it standardized; none of the municipalities has standardized data available for the state.

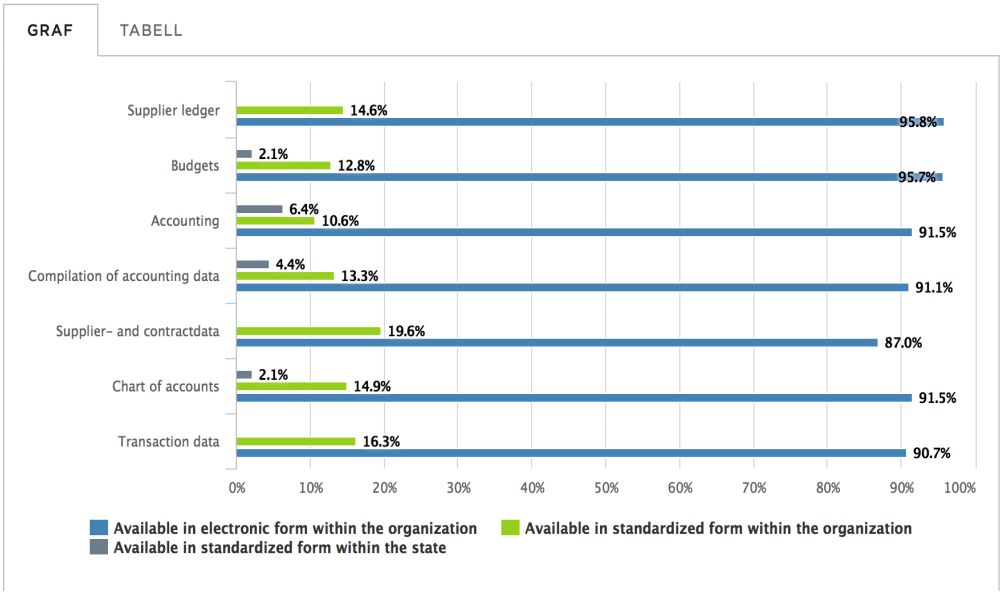

Figure 15 Copyrights by Questback

4.5 DEPENDANT VARIABLE

Dependent variables change if there are any changes in the independent variables expressed as (Standardized processes, Competence and E-procurement). The hypotheses of this paper are based on how changes in the mentioned independent variables effect measuring the dependent variable.

In this thesis, the dependent variable forms the surveys. It is defined by the result in Question 1, which outlines how much municipalities measure performance. Question 1 included two answers scaled from 1-5. The two alternatives are the efficient use of resources and quality. Municipalities are to follow the laws for the efficient use of resources; however, it is important to ensure that quality does not suffer because low-price purchasing can affect the product quality.

Question 1. On what scale does the municipality measure performance?

The results show that 4.4% municipalities prioritize the efficient use of resources, while 8.9% prioritize quality in scale 5. Quality has a significantly higher score on the top scales while the lower values are higher in the use of resources part of the graph.

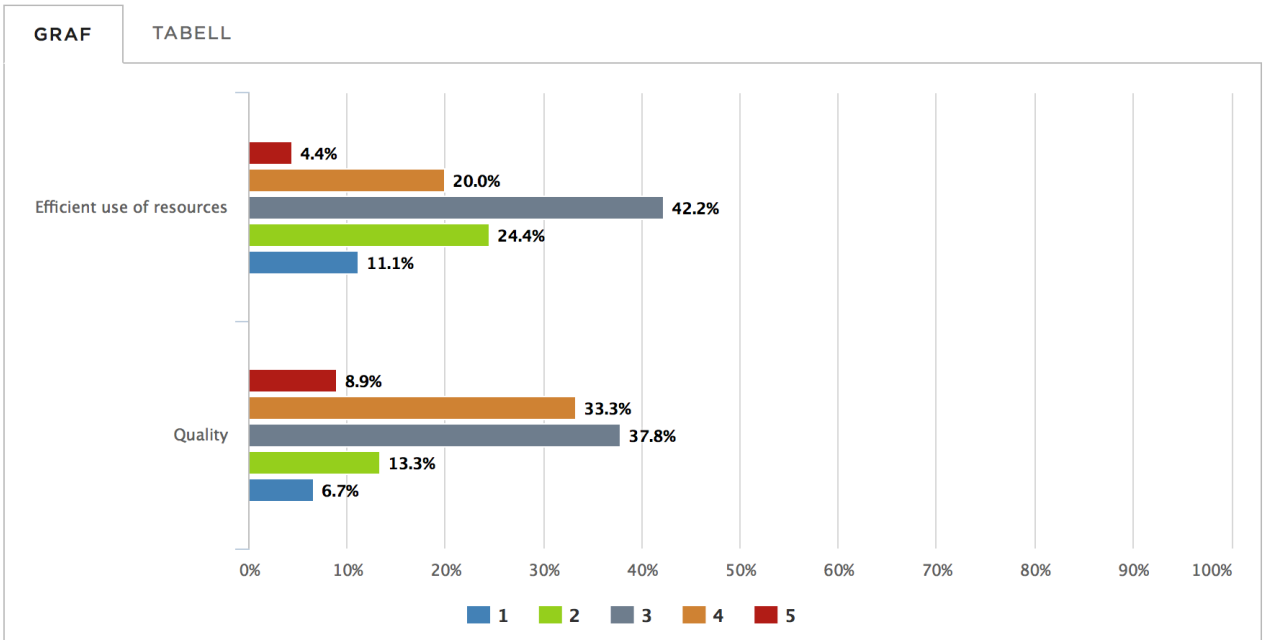

Figure 16 Copyrights by questback

Chapter 5

REGRESSION ANALYSIS (SPSS)

5. INTRODUCTION

Regression is a complex statistical technique that is used for predicting the value of the dependent variable, which in this case is referred to as (measuring). The result will be presented in a following way:

Step 1 – Descriptive statistics

Step 2 – Correlation

Step 3 – Model Summary

Step 4 – ANOVA

Step 5 – Coefficients

Step 6 – Normality

Step 7 – Summary

5.1 DESCRIPTIVE STATISTICS

According to (Arntzen 2014, 8) Descriptive statistics in SPSS is a tool used to describe, characterize, and summarize the sample that is being studied. The result determines whether the data sample has a normal distribution. This thesis presents a descriptive statistical model showing the N value, mean, and standard deviation of the dataset collected. The N value describes the number of respondents and shows how many persons answered all question while taking the surveys. The mean represents the average value in each of the variables. It describes the value on the answering scale that the respondents most commonly answered. The standard deviation describes how much variation exists from the sampled mean.

	Mean	Std. Deviation	N
Measuring	2,9286	,94097	49
Standardized	1,7891	,59587	49
Competence	2,2041	,61168	49
E-procurement	2,1684	,64426	49
Measuring parameter	1,5510	,57956	49

Table 1: Descriptive Statistics

The first thing we need to look at is the N value, which shows the same number of respondents in each variable group. Then, we investigate the variability.

Standard deviation is the most frequently used variability, which represents the average distance scored from the mean. The sum of all deviations from the mean is equal to zero. According to the survey, the mean shows the average value of respondents within measurement based on a scale from 1–5, while the rest of the variables are based on a scale from 1–3. Standard deviation showing all values as zero indicates that the mean values are accurate, and there are no extreme values. The highest standard deviation is the 0.94097 and the lowest one is 0.57958. This means that the answers of the dependent variable (measuring) are most distance from the average mean. The controlling variable (measuring parameters) is the one with the least distance answers. However, both show the value zero, which makes them both significant.

5.2 CORRELATION

After studying the descriptive statistics, I analyze the correlation. The results based on the dataset are shown in table 2; they are created from the descriptive statistics. Correlation will measure in what scale these variables are related.

1 Measuring	1,000	,920	,858	,935	,819
2 Standardized		1,000	,806	,936	,866
3 Competence			1,000	,889	,675
4 E-procurement				1,000	,820
5 measuring parameter					1,000

Table 2: Correlations

The correlation value can be presented from one to zero, where the higher values show a high correlation. The values can be both positive and negative, which defines a positive or negative correlation. The model shows that correlation is quite positive amongst all of the variables.

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Standardized	Competence	Eprocurement	measringparameter
1	1	4,885	1,000	,00	,00	,00	,00	,00
	2	,072	8,222	,65	,01	,00	,00	,08
	3	,029	13,000	,28	,00	,18	,02	,42
	4	,010	21,742	,07	,42	,43	,02	,49
	5	,004	35,520	,00	,57	,39	,96	,00

a. Dependent Variable: Measuring

Table 3: Collinearity Diagnostics

Further, the table above shows that the eigenvalues for four out of five variables is close to zero, indicating that the predictors are highly inter-correlated, and that small changes in the data values may lead to large changes in the estimates of the coefficients.

5.3 MODEL SUMMARY

(Arntzen 2014, 129-133) points out the important factors to study in the model summary is the value R-squared, which is the R-value expressed as a square. Another interesting way of calculating the R-square value is by dividing the Regression sum of squares by the Residual sum of squares as shown in ANOVA. The R-square value is obtained by dividing the Estimate-mean by the Actual-mean. Further, we investigate the standard error of the estimate, which is calculated based on the ANOVA root square of the residual mean square.

The R-square value represents the amount of variation in the outcome that can be explained by the independent variables in the model. The R-square value of the model table 4 shows a value of 0,899, which can be defined as both positive and negative. The positive reaction shows that 89,9% of the variation in my outcome is accounted for by my independent variables, which is quite a high value. The negative fact about R-square is that it can only stay the same or increase if you put in more data. A high R-square could imply that too much irrelevant data has been used, which could result in more inefficiency. This means that the irrelevant data could give a higher R-square, but at the same time, it could make the model insignificant.

Adjusted R-square can help us study how valid the R-square is by comparing the differences in values between them. An adjusted R-square also measures the same measure that R-square measures on a scale from zero to one, but an adjusted R-square penalizes for the inclusion of irrelevant data. If you use irrelevant data, the adjusted R-square will fall, while R-square will rise or stay the same. A rule of thumb is that if the difference between the R-square and the adjusted R-square is greater than 2–3%, it suggests that irrelevant data has been included. In this case, the adjusted R-square shows a value of 0,890 giving a 0,9% difference, which indicates that a significant number of irrelevant data has not been included.

The last important value in this model summary is the standard error of the estimated values. This value measures the distance between the actual values and the estimated values in the regression. The table shows that 0,31195 of the observed values differ from the values on the regression line.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,948[a]	,899	,890	,31195	,899	98,182	4	44	,000

a. Predictors: (Constant), measringparameter, Competence, Standardized, Eprocurement

b. Dependent Variable: Measuring

Table 4: Model Summaries

5.4 ANOVA

The results of the ANOVA are shown in table 5. According to (Arntzen 2014, 129-133) ANOVA determines the linear relationship among the variables in the regression by examining the analysis of variance. The table is defined by columns named the Sum of Squares (sometimes referred to as SS), df (degrees of freedom), Mean Square (sometimes referred to as MS), F (for F-ratio), and Sig. (for significance). The other values are mainly used for computational purposes.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38,218	4	9,555	98,182	,000[b]
	Residual	4,282	44	,097		
	Total	42,500	48			

a. Dependent Variable: Measuring

b. Predictors: (Constant), measringparameter, Competence, Standardized, Eprocurement

Table 5: ANOVA

The "Sig." column is the value of the significance level of ANOVA. To achieve significant results, the number needs to be less than the critical value of alpha, which is set to 0,05. My ANOVA table shows a Sig. value of, 000, which is statistically significant. An important fact to remember is that the significance value is not zero, but some small number too small to be presented by the SPSS output.

2.0 5.5 COEFFICIENTS

The coefficients table is one of the central tables to study; according to (Arntzen 2014, 121-126) it determines the value of the constant. Analyzing the results in the B Colum, T Colum, and Sig. Colum together gives the resultant summary of the regression table. Column B gives the value of the regression coefficients and the constant, which are the expected values of the dependent variable (measuring) when the values of the independent variables are equal to zero. The T table shows the statistical significance of the variables. As a general rule, the T value needs to be 2 or higher in order to prove the statistical significance. The last column (Sig.) gives the p-values for my prediction; I conclude that the B coefficient is significant if the p-value is smaller than 0,05.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-,091	,170		-,535	,595	-,433	,251					
	Standardized	,521	,246	,330	2,118	,040	,025	1,016	,920	,304	,101	,094	10,585
	Competence	,294	,165	,191	1,787	,081	-,038	,626	,858	,260	,085	,200	5,003
	Eprocurement	,560	,261	,384	2,144	,038	,034	1,087	,935	,308	,103	,072	13,984
	measringparameter	,145	,158	,089	,918	,364	-,173	,462	,819	,137	,044	,243	4,115

a. Dependent Variable: Measuring

Figure 6: Coefficients

As described above, B coefficients tell us how many units of measuring performance increases for a single unit increase in standardized, competence, and e-procurement predictors. An example is a 1-point increase in the measuring variable, which corresponds to 0,56 points increase in the e-procurement. Based on the scores of my predictors, I can calculate measuring performance as -0,091 + (0,521 Standardized) + (0,294 Competence) + (0,560 E-procurement). One important concern to reflect on when studying the B coefficients is that all the values are positive. Negative values can indicate problems known as multicollinearity. The only negative value in the B coefficients is the (constant); this should be of no concern because it simply means that the expected value on your dependent variable will be less than 0 when all independent/predictor variables are set to 0.

The next column that will be analyzed is the Sig. Column, which shows the p-value of the predictors. This column needs to show all of the values below 0,05 in order to conclude them as statistically significant. The result from the Sig. table show that both (standardized) and (E-procurement) have values below 0,05; however, (competence) shows a value of 0,081, which indicates that “competence” cannot be concluded to be statistically significant. We can also use the T column to further investigate the statistical significance of variables. The values in the T column also show that both (Standardized) and (E-procurement) have significant values above 2, while (competence) has the insignificant value 1,787.

5.6 NORMAILTY

The histogram plot, which is a check on the normality, should ideally appear normal. Normality is illustrated in Figure 17. As observed, the above histogram is a well-fitted normal distribution.

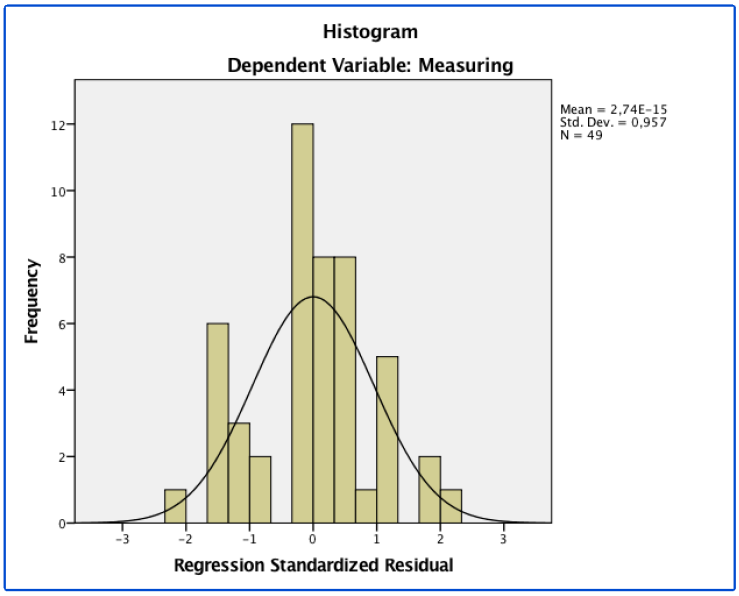

Figure 17: Normality

Similarly, another check on normality is Figure 18 normal P-P plot of regression-standardized residual; the plotted points should follow the straight line. As observed, there are no serious departures, keeping us with the assumption of normality.

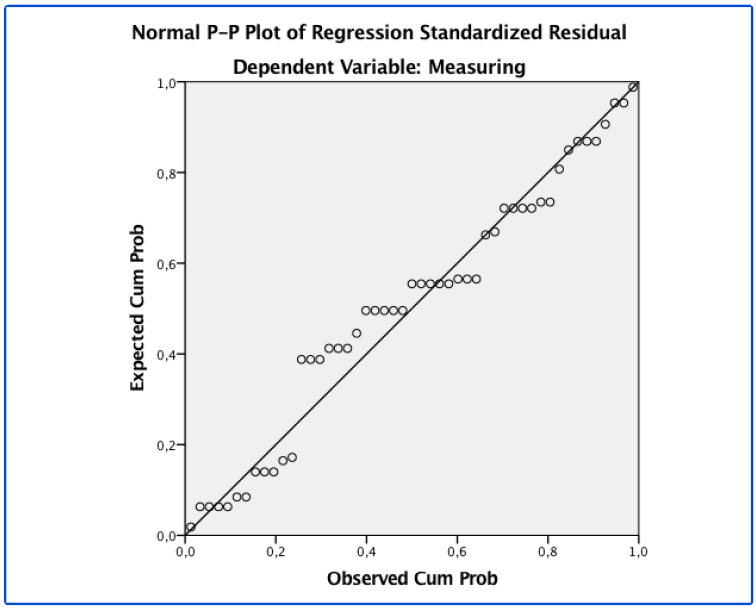

Figure 18: P-plot

5.7 SUMMARY

The descriptive statistical figure 16 shows that the N-value of respondents is 49, which indicates that all respondents answering the surveys completed it successfully. The result showing the highest standard deviation is the 0,94097 and the lowest one is 0,57958. This means that the answers from the dependent variable (measuring) are most distance from the average mean. The controlling variable (measuring parameters) is the one with the least distance answers. However, both show the value zero, which makes them both significant.

After studying the descriptive statistics, I further analyze table 2 correlation. The correlation value can be presented from one to zero, where the higher values show a higher correlation. The values can be both positive or negative corresponding to a positive or negative correlation. The model shows that the correlation is quite positive between all of the variables.

The R-square of the model in table 4 shows the value of 0,899, which can be defined as both positive and negative. The positive reaction shows that 89,9% of the variation in my outcome is accounted for by my independent variables. If the difference between the R-square and the adjusted R-square is greater than 2-3%, it suggests that irrelevant data has been included. In this case, the adjusted R-square shows a value of 0,890 giving a 0,9% difference. This indicates that a significant number of irrelevant data has not been included. My ANOVA figure 20 shows a Sig. value of, 000, which presents a statistical significance. The important fact to remember is that the significance value is not zero.

Finally, I have included the coefficients table 6, which shows that the only value negative in the B coefficients is the (constant). This should be of no concern because it only means that the expected value on your dependent variable will be less than 0 when all independent/predictor variables are set to 0.
The result from the Sig. table shows that both (Standardized) and (E-procurement) have values below 0,05; however, (competence) shows a value of 0,081, which indicates that (competence) cannot be concluded to be statistically significant.

The values in the table 6 T column also show that both (Standardized) and (E-procurement) have significant values above 2, while (competence) has an insignificant value of 1,787. The structure of my analysis are presented as follows:

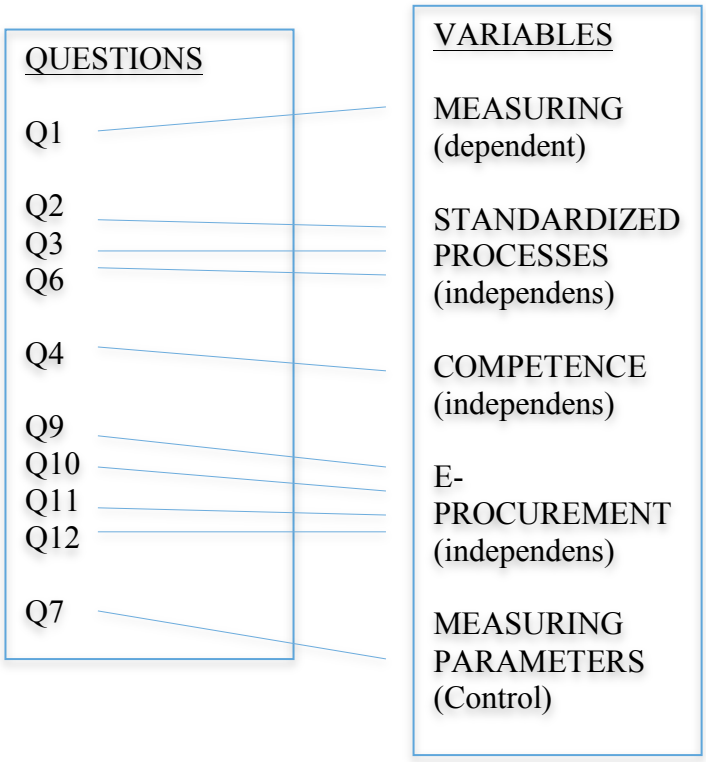

Figure 22 SPSS Components

H1: Standardized processes give better procurement measuring
H2: Higher investment in competence gives better procurement measuring
H3: Use of E-procurement gives better procurement measuring

H2 show a significance value of 0,081, which indicates that H2 cannot be statistically significant. The values in the T Colum also show that both H1 and H3 have significant values above 2, while H2 has the insignificant value of 1,787.

CHAPTER 6

LIMITATION & DISCUSSION

6.1 LIMITATIONS OF THE STUDY

The first limitation of this study is the small sample size. Secondly, it was quite challenging to find participants who were interested in being interviewed and who were ready to answer the survey questions or provide any internal data that could make this thesis representable. Perhaps, spending some more time on data collection would have provided more realistic findings. The specific limitations of this study are given below.

6.1.1 Literature

There is a limited amount of literature on public procurement measuring in Norway, that's the reason for the small number of references discussed in this thesis. I had to read related subjects and identify what could be used as relevant theory for solving the problem statement. The theoretical papers used were mostly based on studies by government organizations. Their theories are well explained but only very few of them have significant proof of implementation. Norway was also undergoing some changes in public procurement measuring while this thesis was underway; therefore, there might be some strategy changes that have not been accounted for.

Literature was used to identify the main tools needed for measuring efficient public procurement. The author of this paper is the only one evaluating the literature used to define efficient procurement measuring; therefore, it is essential to estimate that there is a possibility that other relevant factors not mentioned in this study may be of significance. Using a limited amount of reliable data regarding suggestions for measuring of public procurement could be a limitation; this is because some of the literature may not have evidence of being practiced by any organization in the public sector. Sources such as (Oslo Economics, 2013) and (New Zealand government, 2011) are examples of interesting suggestion without any history of implementations.

6.1.2 Interview

Firstly, the limitations of the interview questions could have followed from limitations in literature because the designed questions were based on the challenges identified in literature. The interview method has numerous limitations, especially because the interviewer had little or no previous experience with such activity. At times, clear focus on the thesis objective could have being lost as the interviewee ended up rambling about irrelevant information. Some additional limitations that may occur during the interview are

unstructured dialogue, which can disrupt the natural flow of the interview. After conducting the interviews, I rewrote all the relevant answers and used them in the study. This activity could have reduced reliability because the interviewer could have the wrong perception of what was explained. Finally, the limitations of the questions asked needed to be considered; unclear questions, closed questions, and irrelevant questions are significant for the outcome of this method.

6.1.3 Surveys

The amount of data collected could be considered a problem. Norway has 428 municipalities; out of these only 80 with at least 15000 residents were considered a relevant target group. The response rate of 80 surveyed was 61,25%, which gave 49 respondents. Data that is collected through surveys often tend to lack details of the subject that is being researched. The result relies much on the respondent's honesty because it is difficult for the researcher to evaluate the precision of the response. The question designed for the surveys were based on the information collected from the interviews; therefore, it could also be affected by the limitations mentioned in the interview.

6.1.4 SPSS

Firstly, I depended on the results collected for the surveys; therefore, it was essential to estimate the limitations following the survey questions could also affect the outcome of the SPSS regression result. The values of the SPSS result were discussed in the previous chapter; therefore, the limitations will be discussed through components giving the result.

Regression analysis is built on three independent variables, one dependent variable, and one controlling variable. Standardized process results are defined by question 2, 3, and 6. Competence is defined by answers in question 4, while e-procurement is defined by questions 9, 10, 11, and 12. The limitation could be related to a small number of components, especially in the independent variable (competence,) resulting from the regression analysis, which also shows that this is the one variable not considered statistically significant. More relevant questions would give more components behind each variable; in this way, the result from the SPSS regression could be more reliable and representative. This study was based on a limited time period, limited data access, and narrow literature; therefore, there is a chance of finding confounding variables. Such

variables can affect the relation between the dependent and independent variable that result in false correlations and incorrect rejection of hypothesis.

6.1.5 Hypothesis

The hypothesis where created on behalf of the result forms the interviews and literature. The limitations connected to the specifications of the hypothesis are depended on the intention to preform public measuring. Without this intention, the managers may have well developed process, high competence and efficient e-procurement but still not preform any measuring. The measuring suggestion mentioned in the literature may be necessary, in order to guaranty the intention for measuring.

6.2. DISCUSSION

6.2.1 Standardized management data

To practice efficient measuring and to use the seven-dataset points provided by Oslo economics, we need to consider better access to data within the public sector. In this part of the thesis, I will discuss methods for optimizing availability and the use of data.
Information provided by the surveys and interviews show that full procurement information was not available, and the managers' responses indicate that there is a significant need for more data to perform the required procurement measurements. With available information on procurement results, organizations can turn to each other and compare (benchmark) their purchase results with other relevant organizations. More access to information can also give more opportunities to perform analysis not only for the individual public organizations but also for the total purchases within the state. The goal is to make data more standardized in the electronic form; this will give data more reach so that it can be used in multiple state agencies without any customization. Further, it will ensure the possibility of comparing data across the state and potentially reduce the time spent in data collection, which gives more time for analyzing, understanding, and managing data. Data access also improves coordination between state actors who may have same interests related to statistics and management data. Some measures may also be intended to make it easier to implement other measures and to avoid duplication.

Data collected by the surveys showed that 45,8% felt a great need for more data, while 50% said that they have access to some data but need more. These numbers indicate that the public sector does not have guidelines that point them in the right direction towards required data availability. These facts show that both organizations and state agencies may have difficulty in analyzing data in order to manage important analyses that are significant for procurement measuring.

Some of the primary challenges for managing public procurement today are the lack of reliable accounting data that improve the state's overall performance image and make comparisons across government agencies. This creates an insignificant record that is not practical for identifying potential trends within categories of goods and services. It further helps in the process of identifying any opportunities to prevent overspending. Lack of data

access also prevents many possibilities to make a significant hypothesis connected to the procurement challenges and to find the potential for increased efficiency.

Results from the interviews of The Ministry of Finance and DFØ (direktoratet for økonomistyring), 2014, made an important contribution in standardizing the chart for accountants. Government institutions have been obligated to use the standardized form since 1st January 2014, but there are still a lot of transactions that are not done by this standard because of lack in implementation. Standardization is an important factor that contributes to more detailed accounting for all government enterprises. This gives government institutions access to compare costs across government agencies and provide significant increase in quality control, which gives great possibilities for managing public procurement. However, answers from the surveys show that municipalities in Norway practice benchmarking; 33,3% are equally divided by small scale, some scale, and large scale. As of today, many municipalities make these reports themselves using DFØ systems or a spreadsheet with simple updating. This implies that the municipalities have a lot of the same needs but they work independently in ensuring the efficient use of recourses. I consider it ineffective for everyone developing their own report, and this will bring them further away from the standardization goal and all benefits that come with it. In implementing common processes for reporting through DFØs, organizations can choose which activities are most relevant to compare with.

Remarkable actions have been taken while this thesis was underway. On 20.04.2016, DIFI announced a new Internet platform providing key figures and statistics on how much state agencies spend on purchasing goods and services. In addition to DIFI's own figures and surveys, data comes from various other sources, such as National Accounts, the State Central Register, SSB, and Administration Database operated by the Norwegian center for research data (NSD). Each state enterprise can extract its procurement statistics and compare them with others. This ability facilitates a higher degree of management and control of procurement costs. It could contribute to more efficient resource utilization. This platform is a significant contribution that gives more standardized data available for all and contributes to easier and more frequent benchmarking and measuring.

6.2.2 Competence

Menon discusses the importance of higher competence in public sector, and they estimated that the state and municipalities could at least save about 10–15%, corresponding to 20–10 billion NOK annually in professionalizing the procurement process. This is documented through interviews with actors who have professionalized purchasing processes, interviews with experts in the field, and an extensive amount of literature. However, it is quite complex to estimate savings caused by expertise because it is complicated to identify how higher competence directly influences public procurement. The state budget of 2016 pointed out some factors that related to Menon's point on how to professionalize their business; combining this literature with the information collected in my interviews shows some significant points on this issue. University in Oslo (UIO) has recognized the importance of public procurement and therefore offers a new master's program concerning public procurement. The objective of this master's program is to obtain more public professional staff member in the public sector; this can contribute to professionalizing public procurement and providing the required knowledge.

Information collected from the interviews show that multiple municipalities have seen positive results that come from updating the internal competence. Some examples are professionalization of e-procurement, which has provided significant savings regarding shorter purchasing time and manual standardized processes. Others have hired more people to handle the issues connected to public procurement; this has given them the opportunity to better control all purchasing activities across the entire municipality sectors. By having additional personnel, they also have the possibility of sending staff away on courses and conferences; this was not possible before because of limited resources. One positive effect that all the respondents referred to is better management of providers and contracts; this results in more contract-based purchasing and better control over the pricing behavior of providers. However, all the respondents had problems defining how higher competencies have contributed to professionalizing the purchasing unit as a whole. While all of them confirmed that higher competence has produced savings regarding purchasing, few could actually connect the positive effects to reports and direct numbers. This could indicate that municipalities have poor implementation process with few or no goals set. As long as they do not establish any measuring parameters regarding the effect that higher competencies give, the result will only be general and nothing specific.

It is important to underline that higher competency is not a lone factor when it comes to savings and professionalizing purchasing process. It works together and depends on other measures to reach a positive result. Rapport by Menon pointed out that better organization and improved management support is required along with higher skills. It is also essential to estimate that a higher use of procurement network, centralizing the purchasing function, increasing management support, and other measures can help to increase efficiency in public procurement measuring without necessarily updating competencies. Putting together some small municipalities and connecting them into one purchasing network does not necessarily come from changes made within the internal competence. However, one thing that I certainly can confirm is that lack of competence leads to purchases that do not create optimal value for users, which contributes to ineffective spending of the taxpayer's money.

Some measuring parameters that could be practiced to investigate the result of competence investments are the cost of having an employee compared with the result and savings brought in by this employee. Some municipalities in Norway have suggested this strategy, but it is too early in the employment period to investigate these numbers. There are some significant limitations to such measuring. The efficiency of employees within procurement shall not only be measured based on costs and savings. If public procurement only focuses on purchasing cheap products, the quality of healthcare and other public sectors would be negatively affected. It is also essential to follow KPIs in order to obtain a better image of where there is a need for more resources. In this way, the municipalities can make sure that they hire the correct candidate in the right sector that is directly related to the problem area. Another significant approach may be to follow Menon's suggestions and investigate if the result is as good as the paper suggests. I think that we should invest in tools that enable more efficient public procurement and measuring; tools that are defined under standardized processes could be a relevant suggestion. Without the correct competence, managers will not be able to perform efficient purchases, KPI development, and automated purchasing using e-procurement or other relevant tools.

6.2.3 E-procurement

E-procurement has emerged as a vital part of the economy, and its benefits have been found to guarantee efficient reductions in cost and in the time taken to conduct a public procurement process. Birgitte Baglo from the municipality in Stavanger pointed out that e-procurement in Dagsavisen is significant and has helped them reach savings up to 20 million NOK in a three-year period (Sæbø, 2002).

Many municipalities that I have spoken to also point out that e-procurement has been a significant tool in reaching cost savings, standardizing purchasing processes, and reducing time-consuming procurements. Surveys conducted pointed out that the use of e-procurement is quite known for Norwegian municipalities; 24,5% of the respondents pointed out that they use it on large scale, while only 51% use it in some scale; and 24,5% use it in small scales. One of the most important benefits of using e-procurement is the detailed data that comes on a transactional level in a standardized form. This data gives managers more access to identifying measuring parameters and to further use that knowledge to reach savings and benefits. More access to data in standardized forms will give managers the opportunity to study the price of a single article and see if it varies over time and between departments or businesses. Besides more data, e-procurement has also standardized many purchasing processes and given a better overview of the products that are being purchased. In this way, instead of buying many different products that give the same result, municipalities buy one product, which gives better price per item and large company benefits.

Some respondents point out that this form of access to data can be reached without having to use e-procurement. Before the implementation, businesses depended on their providers to deliver transaction reports every quarter. Manual processes, such as this can be quite time consuming, and they also put the municipality in a situation where they depend on their providers to follow the agreement and actually provide them these reports. Previous experience has shown that many municipalities had problems with their providers performing this necessary task. Today e-procurement makes this process automated, and it is highly recommended. Even though many municipalities use e-procurement, there are still many managers that base their research on manual processes. Figure 12 pointed out that 35,4% still use manual processes on a large scale, which tells us that the full potential

of e-procurement has not yet been used. However, some purchasing activities are too large and should be done manually as a project. Such activities are necessary for specific investments. From the interview responses, it seems that there is a lack of resources required to use the full potential. Some also believed that the e-procurement process was not implemented properly.

There are multiple advantages for e-procurement; however, there are still a significant number of municipalities that are not using it to its full potential. Anskaffelser.no pointed out that the state offers all public agencies the use of the "e-procurement platform" but numbers from 2012 point out that only around 6 billion NOK of purchases went through the e-procurement platform, which is approximately 1,5% of all public procurement. Today, we can estimate that the numbers are higher because a large part of the public sector uses e-procurement, but still there is a large potential for more efficiency in this area that needs to be recognized.

E-procurement is an important tool but it is at the same time quite challenging to implement. The state should make the process easier for agencies by establishing stipulated guidelines that need to be followed by all. I previously suggested a standardized solution for e-procurement, but it is safe to say that investments following such solutions are extremely high. However, guidelines should be available showing a pathway for efficient implementation and use of e-procurement. In this way, municipalities with limited resources will have a guideline to follow instead of having to do everything themselves. Based on the information about this matter collected from interviews, the state has revised some strategies but they do not offer specific tools and guidelines. Assistance is necessary and could give municipalities more efficient procedures to follow, which could result in more use of e-procurement followed by more benefit realizations through measuring. The literature regarding e-procurement for this study describes an efficient outline to measure the internal development of e-procurement. Such an outline could be used in Norway also to define the level of e-procurements: efficiency, effectiveness, dematerialization, transparency, and competitiveness.

By performing these suggested measurements, municipalities should get a better understanding of the benefits given by their e-procurement solution. The limitations related to these measuring indicators are dependent on benchmarking for mapping what

defines good results. If only one municipality performs these measurements without discussing them with others, they will have problems defining what is actually a good result.

6.2.4 Recourses

Available resources are a central part of the study and are quite related to the issues concerning procurement measuring. The interviews and surveys have shown that there is a significant difference between results and how municipalities perform procurement. Activities, such as established purchasing strategies, measuring parameters, and KPIs have quite different answers. This means that the some municipalities practice them on a large scale while a significant number do not practice or only practice them in some scale. The use of e-procurement also varies on a large scale, where most of the respondents are using it in some scale for performing purchases. During the interviews, I asked for a specific answer regarding this issue and all of the respondents pointed out the limitation of resources.

Performing necessary tasks to achieve efficient procurement processes followed by measuring is dependent on having required resources. Some of the respondents representing the smaller municipalities have pointed out that they have only two staff members controlling procurement. After describing their day-to-day tasks, it was clear that they needed more resources in the form of highly educated personnel. DIFI provides quite clear guidelines for performing the necessary tasks that are expected for public procurement but many municipalities in the country simply cannot deliver up to these expectations because of limited recourses. Some municipalities also pointed out that sending staff to important seminars and conferences is an issue because they are needed elsewhere. It is of vital importance to recognize these issues. Referring to results from surveys and interviews indicate that Norwegian municipalities are operating on quite different levels.

CHAPTER 7

CONCUSION & RECOMMENDATION

7. Conclusion and recommendations

In this final chapter I would like to present the findings and recommendations, in addition I´m hoping this thesis will provide interested researchers direction towards further exploring public procurement measuring. The mentioned pages highlight how Norway can implement a reliable measuring system to streamline its investments and procurement. Identifying suggestion for measuring and detecting the tool that able measuring are the primary concerns of this thesis.

7.1 Conclusion

Public procurement forms a pertinent part of the government's ability to deliver on its services. Nonetheless, lack of a typical measurement to ensure that the process is done in a transparent manner inhibits governments from receiving the value of the costs they incur to provide services to their public. Nonetheless, the development of a reliable framework and policy by the European Union enables OECD countries to come up with a standardized system to guide the selecting officials determine the qualifying firms to translate the functions of the government. The Norwegian municipalities already have the some guidelines and tools; the biggest issue is having the required intention and recourses to use what is already provided. With this thesis I was trying to ensure that specific details of all the stakeholders in procurement are considered, and give a better chance to come up with an elaborate method to guide its measuring process for public procurement. This study concludes that:

Standardized processes able procurement measuring by giving:

- Clear procurement process that documents each step.
- KPI´s providing commitment and goals to each purchase.
- Software solution mapping each activity allowing statistical evaluation.

Higher competence able procurement measuring by giving:

- Staff the necessary coursing/education in order to preform required measuring activity.
- Better agreements and deal providing better measuring results.
- Better order and delivery evaluation giving better measuring results.

Use of E-procurement able measuring by giving:

- Automated purchasing processes
- Better access to data
- Organization, transmit, store and act on information digitally

These measuring enabling tools are quite dependent on the organizations intention to preform measuring. Support for improvement in governance and management (Sigma) is an initiative of the EU and OECD, which provides support and guidance on governance. Sigma discusses challenges in performance measurement and how governments and purchasers can measure the effectiveness of procurement. Study further points out that effective public procurement can be discussed on 3 different levels; at national level, the principal level and at contract level. Since the municipalities are obliged to follow law regulations assuring efficient use of recourses, it would be essential to have some measuring parameter that confirms their performance; therefore it its relevant to consider (Oslo economics 2013) seven measuring points for better control of their investments. Evaluation process of result is considered quite important and related to these measuring processes, the New Zealand Government provides a five-step process for measuring saving and benefits.

Linear regression analysis done in SPSS tests the significance level of thesis hypothesizes, and shows how standardized processes, competence and e-procurement correlate to the dependent variable (measuring). Table 1 Descriptive statistics show the highest standard deviation is the 0.94097 and the lowest one is 0,57958. This means that the answers from the dependent variable (measuring) are most distance form the average mean. The controlling variable (measuring parameters) is the one with the least distance answers. However, both are showing value zero which makes them both significant

Model summary in Table 4 shows that 89,9% of the variation in my outcome is accounted for by my independent variables. The difference between the R-square and the adjusted R-square is 0,9%, which indicated that significant number of irrelevant data has not been included. Table 6 further explain that the result from the (sig.) Colum shows that both (standardized) and (E-procurement) has values below 0,05; however (competence) show a value of 0,081. The values in the T Colum also show that both (Standardized) and (E-

procurement) have significant values above 2, while (competence) has insignificant value showing 1,787. The SPSS result indicate following hypothesis rejection:

- ✓ **H1**: Standardized processes give better procurement measuring
  H0: Standardized processes do not give better procurement measuring

  H2: Higher competence gives better procurement measuring
- ✓ **H0**: Higher competence does not give better procurement measuring

- ✓ **H3**: Use of E-procurement gives better procurement measuring.
  H0: Use of E-procurement does not give better procurement measuring

The thesis concludes that SPSS confirms statistical significance of H1 and H3. H2 show a significance value of 0,081, which indicates that H2 cannot be concluded as statistically significant. The values in the T Colum also show that both H1 and H3 have significant values above 2, while H2 has insignificant value showing 1,787.

7.2 Recommendations

Based on the findings it's apparent that some large municipalities have come significantly further in implementing tools concerning measuring. Result form the surveys and interviews indicate that there is a grate variety in professionalization between municipalities in the country. The biggest reason for this is the differences in recourse availability, giving some municipalities all the necessary recourses, while other smaller once are struggling keeping up. This section will provide relevant recommendations in order to reduce the level of variety identified. Following recommendations are presented:

- The state needs to first of all recognize the differences in recourse availability before expecting better and more efficient public purchasing. In order to reach the factors that where mentions by (Nasjonalbudsjettet 2016) they have to make sure the municipalities have the required knowledge and staff to preform the required deliverables.

- Based on the interviews it was clear that even the largest municipalities didn't consider all seven measuring parameters that where suggested by (Oslo Economics 2013) or saving and benefit measuring discussed by (New Zealand Government 2011). The consequences are; not optimal use of the tools implemented due to lack

of initiative. However, the importance of measuring has recently been confirmed to be significant, and many municipalities are already in the early stages towards developing an efficient measuring process.

- E-procurement has been introduced long time ago in Norway, but still today there are many municipalities preforming unnecessary manual purchasing and other time consuming task that could have been automated. These challenges are related to the difficulties in the implementation process. Many municipalities are left to preform implementation individually; this takes longer time and often results in less efficient results. Collaboration should be considered, or even further merging of purchasing sectors. In this way there would be more assistance to those whom need it, and less sectors needing the implementation. Norway has 428 municipalities divided by 5,2 million residents, this results in many small municipalities needing great assistance in order to preform professionally.

- (Menon 2012) has stated some interesting points regarding the lack of competence in the public sector. According to their studies the country could have significant amount of additional saving each year by professionalizing the public sector through higher competence. In order for this to work additional organizations need to be included, where the country develops collaboration with universities that offer more public procurement related educational plans and offers. Internally within the municipalities there needs to be offered higher education in form of seminars of conferences, where all have enough recourses so they can attend such gatherings. It may also be relevant to consider outsourcing services that may provide required assistance, or even educate staff members. As mentioned before the country is already discussing the possibility of master programs related to public procurement of Norway, this means that importance of higher competence is identified.

- The answers form the surveys show that a significant amount of respondents use measuring related tool such as KPI´s or other measuring oriented parameters in small scale. Municipalities need to recognize the significance of a structured procurement process that is result oriented. This is high related to measuring performance, and quite necessary for professionalizing public procurement.

7.3 Looking ahead

In Norway, sustainable procurement measuring is still in the starting process but the importance of the benefits and savings it brings has been recognized. In order to further implement the idea of performance measuring the state and every individual municipality needs to take interest and initiative. University of Oslo´s idea for establishing a master program for public procurement can significantly contribute to awake the needed initiative and interest, by educating future student and provide them with the required knowledge to further study and professionalize the Norwegian public sector.

Taking on this problem statement has been quite challenging, but at the same time motivating because of the significant contribution the result could give. Short timeline, small number of relevant literature and substantial limited amount data where the main problem areas that made this study process difficult. In the future it's important to recognize these challenges, representative results of studies are quite dependent on them. There is a limited amount of past research concerning public procurement measuring in Norway, and the research is quite dependent on involving the public sector in the process. What I hope to see in the future is more collaboration between researchers and the public sector, where the objective of their studies is to professionalize public procurement. The outcome of such collaboration could give important saving, benefits and better general living for the population of Norway.

End of study.

References

ACAPS, BETTER ASSESSMENTS BETTER AID. (2012, May 01). Qualitative and Quantitative Research Techniques for Humanitarian Needs Assessment. Retrieved from http://www.acaps.org/sites/acaps/files/resources/files/qualitative_and_quantitative_research_techniques_for_humanitarian_needs_assessment-an_introductory_brief_may_2012.pdf

Delrapport B OSLO ECONOMICS. (2013). *Bedre styring av offentlige anskaffelser*. Retrieved from http://www.anskaffelser.no/sites/anskaffelser/files/del_b_bedre_styring_av_offentlige_anskaffelser.pdf

Det kongelige finansdepartement, MELDINGTILSTORTINGET. (2016). *Nasjonalbudsjettet 2016* (Meld. St. 1). Retrieved from http://www.statsbudsjettet.no/upload/Statsbudsjett_2016/dokumenter/pdf/stmeld.pdf

DIFI, ANSKAFFELSER.NO (2015, September 24). Måling og oppfølging av en anskaffelse. Retrieved from http://www.anskaffelser.no/verktoy/maling-og-oppfolging-av-en-anskaffelse/verktøy_for_måling_og_oppfølging.xlsx

DIFI, ANSKAFFELSER. NO. (2015, September 28). Electronic Procurement Platform. Retrieved from https://www.anskaffelser.no/e-procurement/about-e-procurement/electronic-procurement-platform

Svidronova, Maria Murray, and Tomas Mikus. "E-Procurement As The Ict Innovation In The Public Services Management: Case Of Slovakia." *Journal Of Public Procurement* 15.3 (2015): 317-340.

Fjose, Lunde, Mellbye, SVEINUNG. TORSTEIN. CHRISTIAN. (2012). *Verdien av styrket kompetanse i offentlige inkjøpsprosseser* (Menon Business economics). Retrieved from http://www.menon.no/wp-content/uploads/23verdien-av-styrket-kompetanse-i-offentlige-innkjop-2.pdf

Gardenal, D'Angelo, Manzo, FRANCESC. OVALERIO. ANDREA. (n.d.). *A MODEL TO MEASURE E-PROCUREMENT IMPACTS ON ORGANIZATIONAL PERFORMANCE*. Retrieved from http://www.ippa.org/IPPC5/Proceedings/Part2/PAPER2-13.pdf

Gripsrud, Henning Olsson, Silkoset, GEIR. UL.F. RAGNHILD. (2010). *METODE OG DATAANALYSE*. Høyskoleforslaget, Norway: 2. Utgave.

Harvard, UNIVERSITY. (n.d.). Strategies for Qualitative Interviews. Retrieved from http://sociology.fas.harvard.edu/files/sociology/files/interview_strategies.pdf?m=1361986682

National Assosiation of State Procurement Officials, NASPO. (2013). *ERP and E-procurements systems*. Retrieved from http://www.naspo.org/dnn/portals/16/documents/NASPOERPandeProcurementSystems6313.pdf

New Zealand government, NEW. ZEALAND. GOVERNMENT. (2011). *Guide to measuring procurement savings & benefits*. Retrieved from https://www.business.govt.nz/procurement/pdf-library/agencies/Guidetomeasuringprocurementsavings.pdf

SIGMA, OECD. EU. (2011). *Performance Measurement*. Retrieved from http://www.oecd-ilibrary.org/docserver/download/5js4vmnq2gbt.pdf?expires=1463780709&id=id&accname=guest&checksum=D360E5F23C82D377CB3C13D8A0950BF4

Store Norske Leksikon, (2016, April 06). Kommune. Retrieved from https://snl.no/kommune

Sæbø, BJØRG. G. (2002, June 08). Sparer 20 mill. på e-handel. Retrieved from http://www.dagsavisen.no/stavanger/sparer-20-mill-pa-e-handel-1.504909

The Scottish Government, EDINBURGH. (2008). *Best Practice Indicators for Public Procurement in Scotland*. Retrieved from www.gov.scot/Resource/Doc/225005/0060882.pdf - søkeresultater fra Yahoo

Toft Mogstad, L.IVE. MARIE. (n.d.). Personlig intervju. Retrieved from http://ndla.no/nb/node/103449

Appendix A: Interview questions

The questions written below are guidelines for the interviews conducted at 5 municipaleties. This guideline where designed to control the structure of the interview process and to make sure i answer aspects that i wanted to adress. Its important to remember that there where several other aspects mentioned during the interviews.

Questions

1. What tools are most central for allowing measuring?
2. What is most important to measure when it comes to public procurement?
   Process goals?
   Economical goals?
   Innovation?
   Legal obligations?
3. Why is it important for you to follow up on these measures?
4. How specific are these goals formulated?
   Vision?
   Objective?
   Operationalized targets?
5. To what extent do you measure whether these objectives are achieved today ?
6. How do you measure whether these objectives are achieved today ?
   Manually/automated?
   Rapports?
   Daily/monthly/yearly?
7. Is it resource demanding to perform these measurements ?
8. Could measurements been done easier - if so, how ?
9. Do you have required procurement data to perform measurement?
10. Based on your opinion, do you more data in order to preform necessary procurement measuring?

Appendix B: Surveys questions

Surveys

1) In what scale does the municipaletie preform measuring of

	1	2	3	4	5
Efficient use of resources	☐	☐	☐	☐	☐
Quality	☐	☐	☐	☐	☐

2) Does the municipality analyze its supplier market?

- ○ In small scale
- ○ In some scale
- ○ In large scale

3) Does the municipality have any purchasing strategies?

- ○ In small scale
- ○ In some scale
- ○ In large scale

4) Do the municipalities invest in higher competencies?

- ○ in small scale
- ○ in some scale
- ○ in large scale

5) How independent is the municipality on the implementation of measurement processes?

- ○ - Wary indepentent
- ○ - Collaboration in some scale
- ○ - Common standardized guidelines

6) Does the municipality have any established KPIs for result-oriented measuring?

- ○ In small scale
- ○ In some scale
- ○ In large scale

7) Does the municipalities have measuring parameters?

- ○ In small scale
- ○ In some scale
- ○ In large scale

8) Does the municipalities have common suppliers?

- ○ common in large scale
- ○ common in some scale
- ○ No common
- ○ Dont know

9) Does the municipality perform benchmarking?

- ○ In small scale
- ○ In some scale
- ○ In large scale

10) Are manual purchasing processes practiced?

- ○ In small scale
- ○ In some scale
- ○ In large scale

11) In what scale does the municipality use e-procurement for purchasing?

- ○ In small scale
- ○ In some scale
- ○ In large scale

12) Does the municipality need more measuring management data?

- ○ In small scale
- ○ In some scale
- ○ In large scale

13) How available is data regarding

	Available in electronic form within the organization	Available in standardized form within the organization	Available in standardized form within the state
Supplier ledger	☐	☐	☐
Budgets	☐	☐	☐
Accounting	☐	☐	☐
Compilation of accounting data	☐	☐	☐
Supplier- and contractdata	☐	☐	☐
Chart of accounts	☐	☐	☐
Transaction data	☐	☐	☐

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