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The case of the Proquote System for Supply Chain Management at the North West Provincial Department of Public Works and Roads

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Declaration

By submitting this research study electronically, I declare that, **The case of the Proquote System for Supply Chain Management at the North West Provincial Department of Public Works and Roads**, in its entirety is my own, original work, that I am the sole author thereof, save to the extent explicitly otherwise stated.

Date: 20 November 2018

ABSTRACT

The use of Information Communication Technology (ICT) is radically changing the way in which jobs are undertaken. Governments worldwide are embracing technology in their operations, for the motive of improving efficiency and effectiveness.

Technology has a profound impact in making operations much quicker and it reduces human interaction, which is typically the point where corruption is possible. In this case technology tools and systems are adopted and used in public procurement operations of many governments, including South Africa. ICT tools are adopted and used with the aim of reducing the corruption challenges which are normally associated with public procurement processes, among others.

It is in this light that the research sought to study the effectiveness and efficiency of the adoption of the Proquote System used by the North West Provincial Department of Public Works and Roads. The research sought to understand the contribution and impact of ICT tools in Supply Chain Management in the context of South Africa's public procurement process.

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Proquote is an information system that gives government departments' access to registered service providers in a particular area and type of services. The motive for undertaking this study is to assess the efficiency and the effectiveness of the Proquote System as an Information Communication Technology (ICT) tool used in the procurement of goods and services, using the case study of the Department of the Public Works and Roads of the North West Provincial government. The Proquote System had to be put in place as an intervention tool to curb fraud, corruption and other systematic irregularities in the procurement procedures of services and goods.

1.2 Background of the study

Worldwide, organisations are in a quest for improving their organisational competitiveness in order to compete in the 21st century global market. The global market is technologically connected and dynamic in nature. Therefore, organisations need to improve the rate at which they respond to meet these ever changing market requirements. The changes highlight the ever growing importance of and reliance on ICT tools for integrating service providers and supply chain. Supply chain management (SCM) is an approach that has evolved from the integration of these considerations. SCM is described as an integration of key business processes from end user to original suppliers that provides products, services, and information, and which hence adds value for customers and other stakeholders (Kouvelis, Chambers & Wang, 2006: 23).

In its bid to fight fraud and corruption, the North West provincial government introduced the use of this technology. The introduction of the Proquote System required all service providers that would like to conduct business with the North West provincial government to register on the system at the North West tender board offices. In this way, the provincial departments would have access to all service providers' information and contact details. This would then minimise the time a procurement employee would spend trying to source quotations from providers and searching for their contact details. The system can only be accessed by trained administrative clerks in the respective departments.

Public procurement processes have of late been criticised for being ineffective, unreliable and time consuming. Kekana (2011: 34) observe that in most cases the use of ICT tools in public procurement by the government was largely susceptible to the criticism. Thus, the technological systems that were put in place failed to effectively deal with the intended primary problems, which renders the systems useless (ibid). The Proqoute Information System – which was initially adopted as an intervention to reduce fraud, corruption and other irregularities of public procurement processes – was condemned together with other 36 SCM systems in various government departments (Gedye quoted in the Mail & Guardian, 2015).

Opinions are divided on the matter. Some employees in South African government being convinced that all systems, including Proqoute, are highly unreliable and ineffective and hence have to be replaced by a centralised database system operated by the central government. On the other hand, the Financial and Fiscal Commission (2012:12) revealed that the absence of coordination, order, capacity and adequate knowledge and skills of running various ICT systems in public procurement has resulted in many of the ICT tools failing to be the panacea to various challenges that affect public procurement, including the Proqoute System. Gedye (2015: 06) points out that some of the challenges associated with the Proqoute System included poor automation and integration with other key stakeholders whose input and involvement in procurement are critical.

1.3. Problem statement

This study is undertaken in the context of the above background. The Proqoute System as an ICT solution was put in place to enhance effectiveness and efficiency of the government's procurement processes of goods and services. Makene (2009: 13), using a Tanzanian case study, indicates that the use of ICT tools improves efficiency and effectiveness across various government systems and departments, and therefore governments all over the world are positively considering the use of sound e-government systems. These systems have reduced conflict, fraud and corruption, and have improved citizen participation and government's engagement commitments with the citizens.

Therefore, this research sought to investigate the effects that the Proqoute System might have had in the South African government's public Supply Chain Management processes. Using the case study of the North West Provincial Department of Public Works, the study

sought to explore how the Proquote System as an ICT solution is impacting on the public procurement processes. In view of the above discussion, the following research question can therefore be asked:

Has the adoption of the Proquote System contributed towards an improvement in the effectiveness and efficiencies of supply chain processes in government departments?

In other words, can any improvements be seen in the procurement processes of the North West Provincial Department of Public Works since the introduction of the Proquote System?

1.4 Paradigmatic perspective

A research paradigm is explained by Rossman and Rolls (2012:91) as an interpretative framework which is guided by a combination and set of beliefs and feelings about the world and how it should be understood and studied. Simply put, a research paradigm may refer to world views or theory on concepts related to a study carried out by a researcher. Brink (2001: 24) describes a research paradigm as “a set of assumptions about the basic kinds of entities in the world, assumptions about how these entities interact, assumptions about the proper methods to use for constructing and testing theories about these entities”.

There is a general assumption (as depicted in many studies) that the adoption of ICT solutions under the auspices of e-government improved the efficiency and effectiveness in governance systems. This study is consistent with this view. However, in the South African governance systems, quite a number of people believed that the ICT tools in use – including the Proquote System – are ineffective and therefore need to be changed. All these assumptions require scrutiny, and it is therefore necessary to investigate the effectiveness and efficiency of the Proquote System as an appropriate tool for public procurement transactions.

1.4.1 Meta-theoretical assumption

Polit and Beck (2014: 23) describe meta-theoretical assumptions as opinions that a researcher has which are foundational to the research and which are not testable, but are considered to be true. The researcher is guided by the following assumptions:

The use of the Proquote System as an ICT tool in public procurement improves the efficiency and effectiveness of government's service delivery to its general citizens.

The Proquote System is bound to reduce weaknesses, irregularities, leakages and time taken to make procurement decisions, making it possible for the government to timely deliver on its public mandate.

This was confirmed by a number of success stories from different countries, like Rwanda, Russia, the United Kingdom and the United States, which have revealed that the use of ICT tools in public procurement provides efficiency to all the SCM operations of governments and has resulted in projects and operations being completed timely, procurement-related costs being managed effectively, and leakages being avoided (Makene, 2009: 23).

1.4.2 Theoretic assumptions

The theoretical assumptions that follow have been derived from existing literature on public procurement in relation to the use of ICT tools and information systems in SCM operations in the South African government context and are applicable in this proposed study. The use and adoption of ICT tools generally improved government's service delivery activities and its interaction with the general citizenry.

The use of appropriate and effective procurement information systems enables the government to reduce its spending on procuring. Public procurement that is done correctly and properly stimulates economic growth. The application of technology in public procurement reduces bureaucracy and red tape, which are barriers for doing business with the government and for effective service delivery to the population.

The integration of various existing procurement systems reduced duplication and enhances proper cost and production monitoring. Government employees should have the technical capacity and positive attitude toward the use of digital procurement systems.

The main theoretic statement that guides the proposed research study is that the Proquote System, as a digital procurement system adopted to deal with public procurement, will yield effectiveness and efficiency if it is fully and correctly utilised.

1.4.3 Methodological assumptions

Methodological assumptions are explained by Lester (2011: 34) as the basic foundational facts from which theoretical reasoning stems, basing from the researcher's opinions and approach to the research method, design and validity. The researcher believes in an evaluative approach to public procurement, or rather Supply Chain Management research. Supply Chain Management is an operational practice and research should therefore be aimed at generating new knowledge, refining existing practices and updating old knowledge to keep abreast of modern operational challenges.

An evaluative approach to supply chain management research provides the capacity to develop evidence-based practice knowledge to enhance competencies and insight into both procurement employees and public policy makers. The researcher's motive is to provide an evaluative insight that can be useful and applicable in the context of the South African government's public procurement operations.

1.5. Research aim and objectives

1.5.1 Research aim

The aim of this study is to investigate whether the introduction of the Proquote System in the North West Provincial Department of Public Works and Roads has yielded its intended outcomes of improving effectiveness and efficiency in the procurement process.

1.5.2 Research objectives

The research study sought to meet the following objectives:

- To assess Proquote's operational framework and the level of importance and reliability of the Proquote System to the Department of Public Works.
- To investigate the perception (among employees and potential suppliers) of the system and employees' capacity to use the system in their activities.
- To determine the influence that the Proquote System might have on decision-making in the procurement processes.

- To determine the extent to which the Proquote System is contributing towards reducing fraud and corruption in the North West provincial Department of Public Works.

1.6. Conceptualising supply chain management

This section focuses on existing literature on the subject matter. The aim was to provide a theoretical foundation on which the proposed study builds; to describe probable disagreements amongst scholars; and finally to identify the gap in literature that this proposed study seeks to fill. To feature in the discussions will include (without being limited to) to the concept of SCM, ICT and governance.

1.6.1 The concept of supply chain management

Supply chain management as a discipline has contributed much to business efficiency and performance and it has constantly been gaining prominence and attention from both business executives and academics (Ngobheni, 2016:14). Much academic material has been produced on the concept, with some trying to expound on its meaning and the future direction which the discipline will likely take. Many definitions have been used by different scholars – Christopher (1998:15), for example, explains the concepts as a systematic and structured industrial manufacturing process in which raw materials are processed to become finished goods, after which they are delivered to consumers.

Ngobheni (2016: 23) describes the scholar view of the supply chain as inter-connected sets of resources and processes that start with the sourcing of raw materials and expands throughout all the stages up to the delivery of finished goods to the end user of the product. Bolton (2016:03) is of the view that the supply chain incorporates the intentional streamlining of a business's supply-side operations to maximise consumer value and gain competitive advantage at the marketplace. Existing definitions of the supply chain can be summarised as that the supply chain is a process that integrates all processes which take place from transforming raw materials into finished products for use by consumers. Supply chain management is critical to the existence of any institution or enterprise, as it facilitates the logistics of materials from their raw state up until they are processed to become finished products or services. If the supply chain of an entity is not managed effectively it affects the capacity of the firm for delivering its products to the consumers who are the

core and source of the revenue for the firm – hence it is a critical pillar that requires attention and focus (The Council of Supply Chain Management Professionals, 2014:15).

1.6.2 Supply chain management in the government context

Supply chain management (SCM) is not only applied in the private sector, but is a concept that is also used in a number of governments worldwide. Governments such as those in the United States, the United Kingdom, Australia and South Africa, among other countries, have adopted supply chain management in their public service operations logistics (Ngobeni, 2013: 13). The importance and impact of SCM in various governments are illustrated by the rate at which it is being adopted in third world countries, as noted by (Ambe, 2016:279). The adoption and integration of SCM in the government sector has helped improve the efficiency in the public service, as there is increasing pressure from citizens who are demanding transparency and proper utilisation of resources (Ngobeni, 2013: 12). Due to pressure by citizens, as mentioned above, many governments started to use SCM as a tool to stimulate economic development and growth of various industrial sectors and the empowerment of targeted populations (Bolton, 2016: 45).

The size of public procurement varies from country to country, but a global average in developed countries ranges from 5% and 8% of the Gross Domestic Product (GDP) (Gul, 2010:01). In the emerging and less developed countries of the Middle East region and Africa public procurement contribution has been on an increase from an average of 9% in 2010 to 13% in 2013 and 15% in 2016 (World Bank, 2016: 67).

1.6.3 Supply chain management in the South African government context

The history of public procurement in South Africa has largely been influenced by the political leadership and ideology of the day. Before the democratic South African government, procurement was largely skewed in favour of established and large corporates, largely owned by whites. However, after 1994, the majority government with the intention of addressing the past imbalances that were experienced in the apartheid era opted for a preferential procurement route which aimed at providing the opportunities to once marginalised nationals and groups (Frontier Advisory, 2013:9).

Since 1994, the South African government has been instituting legal instruments to clearly spell out the procurement initiative as a tool to address past imbalances (Bolton, 2006: 67). The legislative instruments such as the Preferential Procurement Policy Framework Act of 2000 and the new Preferential Public Procurement Act of 2017 have transformed SCM in a very huge way (Myers, 2017:24). The fundamental issue to note from the existing literature, however, is that despite the well intentions of using procurement as a tool to address the past imbalances policy inconsistencies, poor accountability and shaky transparency structures have been related to and intertwined with the implementation of the preferential procurement framework (Ngubane, 2016: 33). With reference to the case study of the Joint Country Assessment Review and the World Bank in 2001, Kruger (2011:210) concludes that a more unified and properly structured approach to SCM in the South African government context is a necessity.

1.6.4 Information technology and supply chain management

Since SCM has been gaining prominence both in the public and private sector as the norm, technology has also been factored into as well. Information Communication Technology (ICT) tools are continuously being introduced to aid procurement processes and to make them more efficient and effective (Makene, 2009: 10). Due to the complex nature of SCM, the result has been the adoption and introduction of technology in the procurement operations, as technological systems provide greater interactivity between the business and potential suppliers for the maintenance of procurement systems in line with the PFMA and MFMA regulations.

The Mail and Guardian (2015: 03) reports that by 2015 the South African government had close to 40 different SCM systems, including the Proqoute System, which were mostly poorly integrated and operated as “silos”. The central government is of the opinion that the 36 different SCM systems are very ineffective and poorly structured (Ambe, 2016) and that it therefore necessitates the Integrated Financial Management System (IFMS) and a central database system. The aims of these systems are to make data mining much easier and to provide the central government with the platform to calculate costs and to analyse and follow trends effectively (Mail & Guardian, 2015: 03).

In the reviewed literature no study was found on assessing and investigating the claims and views of the central government that the 36 SCM systems are not effective and should

be abandoned, paving the way for a central SCM system. With reference to the case study of the Proqoute System, the proposed research therefore seeks to determine its effectiveness, with specific reference to the North West provincial Department of Public Works.

1.7 Research methodology

This section focuses on issues which relate to the research design; research pre-planning activities; methods of data collection; the process of data analysis; and the ethical aspects of the proposed research.

A research methodology is described by Metler and Charles (2011: 77) as a process used in the collection of information and data for the purpose of coming up with a constructive decision or conclusion. The research adopted a quantitative research approach in order to come up with a well-informed conclusion at the end of the study. The sections below expounds further on this matter.

The study adopted a quantitative research approach, which involves the reliance on numerical and statistical data to examine the relationships between the variables (Metler & Charles, 2011:77). Quantitative research approach is applied to quantify a problem through the extraction of numerical data or data that can be changed become usable statistical information (Ivankova, Cresswell & Clark, 2016: 330). It is an approach that can be used to quantify emotions, ideas, opinions, behaviours and other variables through the use of structured data collection tools and methods (Metler & Charles, 2011:78).

1.7.1 Research design

A research design can be best explained as a strategy which a proposed study will adopt and the action plan by means of which the strategy is to be carried out (Johnson, 2010: 04). A research design clearly spells out the planned methods and procedures for data collection, measurement and analyses (Robson, 2011: 10). Ivankova et al. (2016: 90) view a research design as a master plan or blueprint of the researcher plans to conduct the study. Before designing a research study, a fundamental aspect a researcher has to

understand is the main purpose of undertaking a study. This will in turn influence and inform the best and appropriate research design to adopt (Lester, 2011: 67).

The three widely accepted purposes of research are to explore, to describe and to explain; the researcher therefore ought to understand and pay attention to these aspects (Lester, 2011: 54). Leedy and Ormrod (2010: 23) are of the opinion that an inclusion of all three design approaches provides a better platform for a researcher to carry out a proper and well-informed research study. Thus, in line with Leedy and Ormrod (2010: 78) and the mixed nature of the research method chosen right from the onset, the researcher had to incorporate all three approaches to ensure that all aspects were covered. The exploratory design approach works in the case of new interests by the researcher, whereas a descriptive approach is employed to describe and explain situations and events to fulfil the qualitative needs of the study. An explanatory approach is used to focus on explaining issues and aspects involved in the phenomenon that is researched (Flower, 2009: 109).

1.7.2 Study context

The proposed study was conducted at the Provincial Department (Public Works and Roads) in the North West Province. North West Province is one of the nine South African Provinces; it is subdivided into four districts, namely Ngaka Modiri Molema, Bojanala, Dr Ruth Segomotsi Mompati and Dr Kenneth Kaunda. The Department of Public Works is mandated to provide safer transport, provincial land, and roads infrastructure management systems for a better life for all. The department is made up of skilled and unskilled employees.

1.7.3 Population and sampling

The population is an entire group or elements with common characteristics, whereas sampling is the process through which a small proportion or subgroup of a population is selected for analysis (Creswell, 2003: 56).

1.7.4 Population size

Population refers to any group of people or subjects of study which the researcher wishes to investigate (Sekaran, 2000; Creswell, 2012). For the purpose of this research,

population refers to the groups on which the research focused, which are employees in the North West Department of Public Works, Roads and Transport.

The total population of all employees at the North West Department of Public Works and Roads in the Supply Chain Management unit is 200. The employees include the Member of Executive Council (MEC), Head of Department (HoD), Chief Directors, Directors, Deputy Directors, Supervisors, and Subordinates. The sample of the study was then drawn from the entire department using the sampling technique that is explained below.

1.7.5 Sampling

A “sample” generally refers to a process of selecting units or items from a group or a population with the purposes of finding out results in research (Creswell, 2013:24). The process of selecting a subset of the population which is actually being researched by a researcher and whose findings will be generalised to represent the general entire population, is called *sampling*. Creswell (2013:25) further suggests that simple random sampling is a sampling process in which equal opportunities of selection are provided for each element in the population (Johnson, 2010: 33).

In most research studies in the human sciences, the populations being studied are too large to deal with in the study and hence the researcher must make use of samples (Berg, 2009). Berg (2009) further explains that in order to make generalizations about populations from the samples, we make use of the statistics. The entire population of the North West Department of Public Works, Roads and Transport was to be represented by (N=200) and the sample by (n=68) to draw conclusions about the entire population of the department.

1.7.5.1 Sampling technique

The various sampling techniques employ different methods and ways that enable the researcher to reduce the amount of data that must be gathered, by factoring data from a sub-group rather than using all possible cases or elements (Saunders, 2003). Since this study is a quantitative-method research, the researcher chose to deal with bias by carefully choosing random sampling. All of the 200 employees are aware of or have interacted with the Proquote System. Thus, in the proposed study the simple random sampling technique was employed to facilitate a non-biased sampling process which is

critical to this study. Each employee of the North West Provincial Government had an equal opportunity to be selected as a respondent to the study, as suggested by Bless and Higson-Smith (2000:87).

1.7.5.2 Sample size

A large sample is more reflective of the general population but also costly. For this reason it is crucial to determine an appropriate size for the sample. A fairly smaller sample size, on the other hand, is much less accurate but more convenient for a research study (Bless & Higson-Smith, 2000:93). To determine the sample size calculations were done using the following formula which, corresponds to an online sample size calculator:

$S = (z^2 (d(1 - d)) / e^2) / 1 + (z^2 (d(1 - d)) / e^2)$ where; S = sample size, P = population size, z = z-score, e = margin of error and d = standard deviation.

Using the target group of 200 employees, a confidence level of 95% and a margin of error of 5%, the researcher arrived at a sample size of 132 to be selected as respondents to this study. This sample size was researchable and had the capability to represent the whole target population.

1.7.4.3 Inclusion criteria

All participants who were involved in this study complied with the requirements of being an employee at the North West Department of Public Works and Roads in the Supply Chain Management department. This is very important because the primary target of this study is people who have interacted with or have been exposed to the Proqoute System.

1.7.4.4 Exclusion criteria

Any worker at the North West Department of Public Works and Roads who was not working in the supply chain department, was excluded. Only 132 participants were used as a sample in this study, from a population of 200 workers at the North West Department of Public Works and Roads. Once this number was reached, no other participants could be included.

1.7.4.5 Recruitment of participants

This aspect involves provide potential research participants with information regarding the research, to help in still interest and willingness to serve as research subjects. As explained in previous sections, a non-biased sampling technique was employed.

1.8 Data collection

Data collection generally refers to a process of gathering information from sampled subjects from within a target population or group. In this study, the researcher marked and defined the parameters of the sample that were used. The following section will discuss the tools that were used and the way data was treated and analysed.

1.8.1 Data collection tools

A quantitative questionnaire was designed and administered by the researcher to collect data from the respondents. Each questionnaire was paired with an interview guide that carried a set of questions used to collect qualitative data from the respondents. The Statistical Package for Social Scientist (SPSS) was used for numerical data analysis by the researcher. Microsoft Excel was also used to complement SPSS, particularly on calculations designing visuals. For reliability and validity, the chi-square test was used to test the hypothesis drawn from the findings.

1.8.2 Questionnaires

A questionnaire is described as a set of questions on a form which is completed by the research participant (Johnson, 2010). It is a research tool which involves a set of questions for the purpose of collecting data from research respondents. In as much as they are normally adopted for the application of statistical analysis participants' responses, this is not always the case. The questions can be open (allow comments) or closed (Yes or No). The main objective of the use of questionnaires is to illicit information (facts or opinions) about the research or phenomenon from respondents who are informed about issue at hand.

Questionnaires have benefits in comparison with other types of surveys, in that they are cost effective, they generally do not demand as much effort from the questioner as verbal or telephone surveys, and often have standardised answers that make it simple to compile data (Gillham, 2008). On the hand, standardised responses may inhibit the research participants. Questionnaires are much constrained by the fact that respondents must have the ability to read and write in order to provide the required responses sought by the researcher. Hence, in some instances and demographic groups it may not be effective and at the same time practical to undertake a research survey by means of a questionnaire (Gillham, 2008).

The proposed study makes use of the Likert Scale type of questionnaire to allow respondents to be both objective and subjective in response. A Likert item can be simply described as a statement in which the research respondent is requested to evaluate according to any kind of subjective or objective criteria – generally, the level of agreement or disagreement is measured. It is considered symmetric or "balanced" because there are equal amounts of positive and negative positions (Alvin & Ronald, 2008). The format of a typical five-level Likert item is "Strongly disagree", "Disagree", "Neither agree nor disagree", "Agree", and "strongly agree". The questionnaire will be administered to 68 respondents in the organisation.

A Likert Scale type questionnaire was developed and presented to the employees of the Department of Public Works and Roads, with both open-ended and closed questions. Employees were randomly selected from the organisation.

The questionnaires were hand-delivered due to the proximity case study. The researcher hand delivered each questionnaire to different respondents by randomly knocking on their doors and requesting the respondent's time and patience.

Lester (2011) states that the single biggest administrative disadvantage of using self-administered questionnaires is the fact that once the questionnaire leaves the surveyor's office, he or she has no control over who, in fact, completes it and whether that person consults with others when completing it.

1.9. Ethical considerations

A declaration of confidentiality was given to subjects and their right to privacy and anonymity was explained to them. Collected data was handled with integrity and utmost honesty, especially in terms of the administration of questionnaires. The study also ensured lack of bias and persuasion whilst targeting a high response rate (Lester, 2011). The study was solely conducted for academic purposes. Participation in the study was voluntary.

1.9.1 Permission and informed consent

It is critical that all researchers should be equipped and aware of research ethics. The study was carried out with objectivism to limit all potential risks of bias, manipulation by other motives and oversimplification of certain issues that will arise in the course of the research.

The researcher only went to the field on an educational mission as an extension of the NWU School of Economic Management Sciences. Secondly, permission was requested from the Head of Department of the organisation (HOD) to request a written approval by the HOD.

1.9.2 Confidentiality and anonymity

To maintain the anonymity of the participants, pseudonyms were used in place of their real names. In this study all participants are anonymous. Participants were informed that the information to be sought in this study was only for academic purposes; that the data would be strictly protected; and that none of their personal information or identity would be given disclosed.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section seeks to offer a thorough discussion of the existing literature on the subject of public procurement and e-governance. The aim is to provide a theoretical and conceptual foundation on which this study is built. The discussions will include (but not be limited to) the concept of SCM, ICT and the public sector which are underpinning topics in this study, whilst relevant case studies across the globe will be closely analysed. In the end this section will highlight probable agreements and disagreements amongst scholars, showing the gap in the literature that this proposed study seeks to fill.

2.2 Overview of SCM, ICT and the public sector

In the drive to achieve efficiency, effectiveness and transparency of public business operations, there is a need to synchronise SCM and ICT initiatives within the parameters of what is popularly known as e-governance. The development of the Internet created the primary and fundamental infrastructure for electronic government (hereinafter referred to as e-government), both in information and service delivery and in facilitating the exchange of information with an informed and aware citizenry (Ojha, Palvia, & Gupta, 2007:160). The introduction of technology is a good opportunity to fully review the administrative business process, measure and evaluate its inefficiencies and to reform, simplify and streamline it (World Bank e-GP Draft Strategy, 2007:15).

According to Lee (2017:6), since the 1990s a number of developed countries including the United States (US), Britain (UK) view e-government as a key strategy for improving national competitiveness and government innovation. The term "e-government" was first used in the US in 1993 and it became more pronounced during the Clinton administration in their persuasion of reengineering business process using ICT as part of government rejuvenation (ibid). According to Buckley (2003:23), e-government is defined as the provision of government information to citizens and the facilitation of active citizen participation and consultation through ICT means. The UK Modernising Government White Paper of 1999 cited in (Lee 2017:6) stated that under Prime Minister Tony Blair, the UK

modernised its governance by adopting e-government projects for citizen-centred innovations. Australia promoted what was called "On-Line Australia" in 1999 (ibid).

In recent years, political leaders in distinguished countries, heads of international organisations and regional unions, such as the United Nations (UN), the Organization for Economic Cooperation and Development (OECD), and the European Union (EU), made e-government a priority of national agendas and thrive to improve its use in governance (The Ministry of Public Administration and Security, Korea Information Society Development Institute, 2008:67). In developing countries, such as Zimbabwe, where e-government is yet to be implemented, e-government has been used as a campaign product to attract the electorate in the recent 2018 harmonised election by one of the opposition leaders (The Daily News, July 2018:23).

2.3 Conceptualisation of supply chain management

Supply chain management as a discipline has contributed a lot to business efficiency and performance and it has been gaining prominence and attention from both business executives and academics constantly (Ngobheni, 2016:14). Much academic material has been produced from different dimensions, and it will take a lot from different scholars to expound the meaning of SCM.

SCM is generally understood as a process in which goods are transformed from raw materials to the finished products including the flow of information. Frontier Advisory (2013: 05) explains SCM as a concept that is a systematic and structured industrial manufacturing process in which raw materials are processed to become finished goods after which they are delivered to consumers. Mago and Toro (2013:21) refer SCM as an inter-connection between set of resources and processes, starting with the sourcing of raw materials throughout all the stages production involved up to the delivery of finished goods to the end user of the product. Bolton (2016:03) is of the opinion that supply chain incorporates the intentional streamlining of a business's supply-side operations to maximise consumer value and gain competitive advantage at the marketplace.

In a summary of all the definitions provided, the underlying general description of SCM is that it is a process that integrates all processes which take place from transforming raw materials into finished products for use by consumers. SCM is critical to the existence of

any institutions or enterprises as it facilitates the procurement and logistics of materials from their raw state up until they are processed to become finished products or services. If the supply chain management of an entity is not operating effectively, it affects the capacity of the firm to deliver its products to the consumers, who are the core and source of the revenue for the firm, hence it's a critical pillar that requires attention and focus (The Council of Supply Chain Management Professionals, 2014:15).

2.4 SCM in the public sector

SCM is not only found in the private sector. It is a concept that sought avenues into the public sector and is being used in governments departments worldwide. Governments of countries such as the US, UK, Australia and South Africa, among others, have adopted supply chain management in their public service operations (Ngobheni, 2013: 34). The importance and impact of SCM in various governments can be testified by the rate at which it is being adopted in third world countries as noted by Ambe (2016:279). The adoption and integration of SCM in the government sector improved efficiency in the public service to meet the increasing pressure from citizens demanding transparency and proper utilisation of resources (Ngoben, 2013: 34). Due to pressure by citizens, as mentioned above, many governments started to use SCM as a tool to stimulate economic development and growth of various industrial sectors and the empowerment of targeted populations (Bolton, 2016:61).

According to Ibne Mahmood (2013:117), in the past decade public procurement has grown substantially as government procurement stood at 18.42% of the world gross domestic product (GDP), which is about 10% of Korea's GDP (Singer et al., 2009: 24). Although the size of public procurement varies from one country to another, global average government procurement in developed countries ranges from 5% and 8% of the GDP as noted by Gul (2010:01). In the emerging and less developed countries of the Middle East region and Africa, public procurement contribution has been on an increase from an average of 9% in 2010 to 13% in 2013 and 15% in 2016 (World Bank, 2016: 103). Mi Jung (2010: 28) factored out public procurement as an influential factor in a county's economy and an important function of the government

2.5 ICT and SCM in the public sector

SCM has been gaining prominence both in the public and private sector, at the same time that the use of technology became commonplace. Information Communication Technology (ICT) refers to a set of interconnected components that gather, process, store, and distribute information to support decision-making and control in an organisation (Ralph, Reynolds & Chesney, 2008: 06). Information systems may also be applied to problem analysis situations and visualisation of complex subjects.

ICT plays a key role in the transformation processes of the public sector (Svidronova & Mikus, 2015:318). ICT experienced a significant growth worldwide in the 1990s, and among the most important ICT-driven innovations in the public sector is the creation of e-government (Svidronova & Mikus, 2015:318). It can therefore be said that e-government is an immediate result of the implementation of ICT in public administration.

E-government procurement generally refers to the use of ICT (the Internet) by governments in conducting their procurement relationships with suppliers when outsourcing goods and services for the public sector. According to Rogerson (2013:1), governments use the ICT in their SCM to encourage the procurement procedures of specific merchandise, works and accessing administrations of small cost and great size (e-Tendering) or to buy standard products and services of small cost and great size (e-Purchasing). Whereas e-Tendering takes the simple steps of offering (e.g. online distribution of procurement notice, download of bidding documents, online pre-bid conference, transfer of offers, electronic offered opening), e-Purchasing frameworks can incorporate the utilisation of online catalogues, e-reverse selling, or e-Requests for Quotation/Proposals (Ibid.). In any case, e-Purchasing ought to begin with a pre-qualification procedure which may utilise the e-Tendering approach to distinguish the pre-qualified supplier(s).

ICT tools are continuously being introduced to aid procurement processes in becoming more efficient and effective (Makene, 2009: 19). Evidence from Western Australia suggests that ICT innovative changes took a complementary approach rather than conflicting approaches when it comes to public governance (Kramer, 2016: 23). As a result, a thorough review of the administration's supply and demand chain can be carried out through e-government procurement assessments, and the weaknesses of the

administration identified even beyond the specific procurement aspects. Due to the complex nature of SCM, the result has been the adoption and introduction of technology in the procurement operations, as technological systems provide greater interactivity between the business and potential suppliers.

Makene (2009: 12) studied the role of ICT in effective government service delivery using the case study of the Tanzanian power company. The research found that there was a greater link between the use of technology and improved service delivery. Magagane (2012) holds the view that that due to the use of ICT in procurement services, advantages that can be realised include reduction of costs, time, and the maximisation of economies of scale and bringing the business entity much closer and connected to both its customers and suppliers. Negash, Anteneh and Watson (2012) observe that the use of ICT tools makes it possible to shorten production processes through substituting human effort with technological systems, which are normally highly effective and as such benefit the interests of the firm. The Korean e-procurement system is a successful example that efficiently improved the government procurement process by making it more transparent and professional and (Taylor & Raga, 2010). It is recognised in the 2005 UN reports for the best practices of e-government (ibid).



2.6 Benefits of ICT in public sector SCM

There are traceable benefits of using ICT SCM in the public sector. Working with taxpayers' money in outsourcing goods and services for the public sector requires higher levels of transparency and accountability in business conduct, whilst effectiveness and efficiency in such deals are a necessity. This is what ICT offers when it is well implemented and appreciated to the governments, suppliers, and the public in general. However, this is fraught with considerable challenges, as pointed out by (Kremer, 2016:35).

Opperman (2014:23) stipulated that the key component of ICT in the government is that it catalyses the improvement procedures by motivating the economy, bringing down the numerical space, improving the open division and progressing government execution. By creating a virtual environment that brings together governments and private industries, ICT will deliver a merited win-win situation amongst stakeholders (Odiaka, 2014:35). This also has a political reoccurrence from the public in overall as openness and effectiveness

increases in using tax funds, which can add to improve the appearance of organisations (ibid).

In handling and recording procurement data and business online, ICT offers more straightforwardness and justice. ICT makes a difference by reducing openings and motivating forces for extortion (anti-corruption), to enhance the quality of government procurement administration, counting checking and decision-making, and to energise the cooperation of private businesses in the public market by expanded reasonableness and competitiveness (Basgeet, 2014:43).

ICT in the form of e-government reduces contact between corrupt officials and citizens and it increases transparency, as is confirmed by a great deal of anecdotal evidence (Basgeet, 2014:43). In Pakistan, for instance, the entire tax department was restructured, and ICT systems were introduced with the stated purpose of reducing contact between tax collectors and tax payers. In the Philippines the Department of Budget and Management established an on-line e-procurement system that allowed public bidding for suppliers and the system improved transparency in transactions (Odiaka, 2014:35).

In South Korea, the Online Procedures Enhancement for Civil Applications allows ordinary citizens to monitor applications for permits or approvals where corruption is most likely to take place; it also allows questions to be raised in case irregularities are detected. In the Indian state of Andhra Pradesh, where 40% of its 76 million people cannot read, 214 deed registration processes have been fully computerised. This has made the process of deed registration easy and transparent. The process started in April 1998 and by February 2000 about 700 000 documents had been registered. Before the introduction of online registration, opaqueness of procedures forced citizens to employ middlemen who used corrupt practices to obtain services (Bolton, 2016: 09).

The use of ICT has vast potential to improve proficiency, which can substantially add to the reduction and redistribution of fiscal expenditures. In Germany it was estimated that public online procurement would decrease buying costs by 10-30 % and exchange costs by 25-75% (Okundi, 2014:03). Despite the lack of investigations on comprehensive profits in terms of quantity and quality, the use of ICT in SCM is increasing in a number of countries due to efficiency gains (Bolton, 2016: 12).

Given the broad timeline of paper-based department procurement, smaller procurement rotations are comfortable to both the department and the service providers (Edquist & Zabala-Iturriagagoitia, 2012:1760). Through the summary of the Government electronic Procurement System (GePS), Korea can save US\$ 2.7 billion of all government procurement (US\$ 17.1 billion), in a US\$ 26 million venture. Among 1998 and 2002, employees of the Public Procurement Services PPS were decreased from 1 058 to 935, whereas the overall government procurement capacity expanded by 30% (from US\$ 12.8 billion to US\$ 17.1 billion). Instalments to service providers are automatically shifted, which as a rule takes not more than 4 hours (ibid).

In Romania, the use of a government-wide e-Procurement system affected collectively about 1 000 public activities and 8 000 service providers. In the first 4 months of 2003, more than 60 000 transactions were made. The Romanian Ministry of Communications and Information Technology saved 22% (US\$ 35.5 million) through the adoption of the e-GP platform, on an amount of US\$ 161.4 million for goods and services (Dawar & Oh, 2017: 34).

Table 1 below; present the benefits of using ICT in the public sector.

Table 1: Benefits of ICT in the public sector

	Department	Service Provider	Community
Transparency	Anti-corruption Expanded number of service providers Vastly improved integration and communication among departments Expert procurement observing Higher quality of procurement decisions and statistics Political reoccurrence from the community	Increased fairness and competition Improved access to the government market Open the government market to new suppliers Stimulation of SME participation Improved access to public procurement information	Access to public procurement information Monitor public expenditure information "Have a say" Government accountability

		Government accountability	
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Efficiency Costs	Lower prices Lower transaction costs Staff reduction Reduction in fiscal expenditure	Lower transaction costs Staff reduction Improved cash flow	Redistribution of fiscal expenditure
Time	Simplification/ elimination of repetitive tasks Communication anywhere/anytime Shorter procurement cycle	Simplification/ elimination of repetitive tasks Communication anywhere/anytime Shorter procurement cycle	Communication anywhere/ anytime

Source: World Bank e-GP Draft Strategy, 2003

In table 1 above, the benefits of the adoption of ICT tools are many and could probably be the reason that justifies continuous investment and adoption of ICT tools by various governments worldwide. The use of technology, with reference to the table above, provides benefits both to the suppliers of goods and services, the public (especially in terms of public expenditure of tax) and the government.

From a strategic point of view, the use of ICT in conducting public business will yield a number of benefits, as explained below.

2.6.1 Equal access

- E-governments procumbent methods (herein referred to as e-GP systems) support equal access for all competent purchasers as they build up and implement a history of using the Internet.
- Decreasing charges and procedural impediments of outside bidders and of bidders outside the capital cities, by empowering them with electronic means to obtain offices that are unbiased to topography and time-zones. Cooperation rules that make a level playing field are essential. This requires easy access to innovation,

and also effective procurement methods for successfully obtaining these innovations, for example preparing, specialising and acknowledging paper offers.

2.6.2 Encouragement of local industry

Local firms should be supported to participate in local or global competitive opportunities with regard to the following:

- Continuously decrease the gap in offer arrangement skill between neighbourhood and outside providers by standardising the obtainment documentation and giving provision capacities for planning of and compliance with offers.
- It increases the chances of obtaining or accessing information on contracting and subcontracting openings, which is critical for the efficiency of any ICT procurement system. A case in point is the CAMS method in Western Australia, which tracked an entire ICT procurement system to encourage improvements, improved administration and effective connection with various local workplaces. As a result, neighbourhood providers are presently winning 90% of local contracts.
- Encourage the examination of open procurement information to distinguish zones of opportunity for neighbourhood endeavours.

From the point of view of the objective of straightforwardness of a bank procurement plan, e-GP frameworks, the following recommendations are made:

- Make the handling cycle of procurement business completely straightforward. All solicitations, timetables, capability conditions, questions and answers, offering documents, and the occasion logs of connections can be made freely accessible through the Web.
- Decrease uncertainties, delay, and potential for control inalienable in paper-based procurement relations. Through key open framework innovations, the compliance, greetings, opening, verification, and capacity of electronic archives are distant and more secure, convenient, unequivocal, dependable, and irrefutable than for paper archives.
- Increment of straightforwardness of the open procurement work by giving electronic access to database of all open procurement information and enabling numerical examinations of that information.

- Encourage the authorisation of the procurement procedures and the endorsing of guilty parties through transitory or changeless avoidance from procurement chances.

2.7 Critical factors of success for ICT in SCM of the public sector

In Africa, existing literature confirms that politics are a major determinant factor in many aspects. Firstly, there is a need for strong government leadership when the idea and objectives are set. This requires almost collective commitment for altering the development and governmental structures, and defining the approaches and techniques that are vital for the flourishing of ICT (Okundi, 2014:01).

The government needs to supply the empowering environment for ICT by defining the individual approach and legal system. In selecting an approach, it must be considered in which way ICT will be included in the existing public procurement policy. Various laws, controls, and rules may obstruct ICT-inventive approaches in government SCM practices (Myres, 2017). For example, if the procurement law requires signed papers as part of the procurement process, it will not be possible to develop a fully integrated ICT-based SCM system until a legal framework has been developed which validates the digital signature (Bolton, 2016).

Adoption of ICT in the SCM of the public sector requires major government-led organisations to change their view of the procurement procedure as well as their view of the organisation (Ngcamphalala & Ambe, 2016:1210). Open procurement online requires the re-engineering of the conventional procurement procedures which involve a manual and paper-based work. The method of composing a procurement notice and posting it on the net by hitting one button replaces the conventional procedures of composing the notice, sending it to a daily paper, and printing it. Main changes of the conventional open procurement procedure result in organisational rebuilding of the government procuring supports. Tedious and unchanging duties can be moved online and do not require human assets (Quinot, 2017: 03).

There is also a greater need of awareness and capacity building across the government sector, private sector and the public in general who will be the beneficiaries of the services

and goods purchased. The human resources who manage the ICT-based SCM systems – thus, the ones who make significant choices – characterise procedures and utilise the framework. They should be rigorously trained. Many ICT initiatives fail in the public sector because little or no training is provided to the people who must use the technology (Makene, 2009).

2.8 SCM and legislation in the South African government

The history of public procurement in South Africa has largely been influenced by the existing political leadership and ideology of the day. Before the democratic South African government, procurement was largely skewed in favour of established and large corporates, largely owned by whites. However, after 1994 the majority government – with the intention of addressing the past imbalances that were experienced in the apartheid era – opted for a preferential procurement route which aimed at providing opportunities to once marginalised nationals and groups (Frontier Advisory, 2013:9).

Since 1994, the South African government has been instituting legal instruments to clearly spell out the procurement initiative, as a tool to address past imbalances (Bolton, 2016: 05). The legislative instruments such as the Preferential Procurement Policy Framework Act of 2000 and the new Preferential Public Procurement Act of 2017 have radically transformed SCM (Myers, 2017:24). However, existing literature makes it clear that, despite the positive intentions of the Preferential Public Procurement Act of 2017 as a piece of legislation to address the past imbalances and to guide the public procurement processes, policy inconsistencies, poor accountability and shaky transparency structures have been chief among the challenges in terms of the implementation, monitoring and evaluation of this policy framework (Ngubhane, 2016: 54).

Using the case study of the Joint Country Assessment Review and the World Bank in 2001, Kruger (2011:210) urges that a more unified and properly structured approach to SCM in the South African government context is a necessity. In addition, technological solutions should be well appreciated as they will increase transparency, efficiency and effectiveness in various structures (ibid).

2.9 ICT in the South African government's SCM

Since the South African government has embraced SCM in its public procurement operations, the technology systems have been widely used, and R10 billion was spent on ICT, for example (Frontier Advisory, 2013: 21). Kekana (2009: 31) found that the South African government has been embracing and adopting various ICT tools to use in many different departmental operations, including SCM, largely to deal with the many challenges of corruption and leakages which have been associated with public SCM.

Significant progress has been made to address issues concerning the coordination and interoperability of various systems through the establishment of a central Office of the Government Chief Information Officers (OGCIO) and the State Information Technology Agency, mandated to provide information technology and system-related services (Balkran, 2017: 12). The creation of the Office of the Chief Procurement Officer was necessitated by the need to centralise and coordinate all procurement activities and the office is also responsible for the maintenance of procurement system in line with the PFMA and MFMA regulations.

According to the Mkwanzani (2015: 12), by 2015 the South African government had close to 40 different SCM systems, including the Proqoute, which were largely poorly integrated and operated as “silos”. The central government is of the opinion that the 36 different SCM systems are very ineffective and poorly structured (Balkran, 2017: 06). As a result, there is a need for the Integrated Financial Management System (IFMS) and a central database system to make data mining much easier and to provide central government with the platform to calculate costs and analyse and follow trends effectively.

In conclusion, no existing studies could be found on assessing and investigating the claims and views of the central government that the 36 SCM systems are not effective and should be abandoned in favour of a central SCM system. Therefore, using the case study of the Proqoute System, the proposed research seeks to determine its effectiveness, with specific reference to the North West Provincial Department of Public Works.

2.10. Conclusion

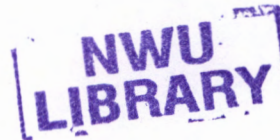
This chapter on literature review provided the existing literature on the subject matter and exposed the gap that is there which it seeks to undertake. The next chapter is on Research Methodology which provides the methodology adopted for this particular study.

CHAPTER 3

RESEARCH DESIGN & METHODOLOGY

3.1 Introduction

In this chapter the methodology used by the researcher to accomplish the desired aims and objectives of this study will be explained. Attention will be paid to, among others, the selected research method, the selected design, sample size, means in which data was collected, how data was analysed, and underpinning concerns of ethical considerations. Metler and Charles (2011) define research methodology as the procedure followed in the collection of data for the purpose of coming up with a constructive and informed decision or conclusion. This chapter will also indicate the rationale behind any choice of technique or tools used in this study.



3.2 Research method

To achieve the desired aim and objectives, a quantitative research approach was used in the research. The choice of adopting the quantitative research was motivated by the need to investigate and provide a statistical explanation of the effectiveness and efficiency of the Proquote System in the North West Provincial Department of Public Works and Roads.

Quantitative research involves the reliance on numerical and statistical data to examine the relationships between the variables (Metler & Charles, 2011:77). The main aim to involve quantitative methodologies in this investigative study from sampling to data analysis was to make use of its tenets of classifying and quantifying features, thus counting them and constructing an objective statistical explanation of what is observed.

3.3 Research design

A research design can be best explained as a strategy which the study adopted and the action plan according to which the strategy was carried out (Babbie & Mouton, 2002:270). A research design is a matter of *what?*, *how?* and *with what aim?*. A research design clearly spells out the planned methods and procedures for data collection, measurement and analyses (Schindler & Cooper, 2003:170). Babbie and Mouton (2001) explain research design as a master plan or blueprint of the researcher plans to conduct the study.

3.3.1 Research philosophy

It is important to describe the research philosophy that guided the construction of this research, for the research to stay within the desires of its aims and objectives. Since this research used a quantitative method, two lines of philosophical thinking guided the construction of this research design, namely objectivism and post-positivism. The ontology behind the objectivism of this study is that there exists a quantified reality regarding the effectiveness and efficiency of Proquote System at the North-West Department of Public Works and Roads. The epistemology of this objective view is that with knowledge of such a reality, the effectiveness and efficiency of the Proquote System can be improved in terms of its quality, to approximate the reality about efficiency and effectiveness of the Proquote System. In this manner, the process becomes increasingly objective, as is sought by one of the objectives of this study. Human perceptions do not play an important role in this philosophical thinking, and it is therefore possible to avoid bias.

Secondly, since this research is investigative in nature and because people's opinions and perceptions are not taken into account, the researcher used a qualitative philosophical thinking approach as in post-positivism. The involvement of post-positivism philosophy in the formulation of this research design was mainly to facilitate its element of subjectivism, which is important when an investigative study is carried out. Post-positivists believe that the world is not a fixed entity but exists in subjectivism. In subjectivism, common knowledge is not common, and laws and theoretical models can only explain the relationship between cause and effect (Flower, 2009) of a particular phenomenon, but such knowledge cannot be generalised to another sample.

In this study, the researcher wanted to investigate the personal experiences of sampled employees at the North West Provincial Department of Public Works and Roads regarding their interaction with the Proquote System in the course of their duties. Therefore, the researcher had to exercise great caution not to generalise personal experiences.

3.3.2 Research purpose

The researcher has to understand the main purpose for undertaking a particular study. This will then influence and inform the best and appropriate research design to adopt

(Lester, 2011: 102). The three widely accepted purposes of research are to explore, to describe and to explain. Leedy and Ormrod (2010: 56) express the view that encompassing all three design approaches provides a better platform for a researcher to carry out a proper and well-informed research study. Therefore, in line with Leedy and Ormrod (2010: 23) and because of the research method approach to research which is used in this study, the researcher will incorporate all three these purposes.

3.3.3 Research strategy

The research strategy for this study involves a case study approach. McLeod (2008: 56) defines a case study as an in-depth investigation of a single person, group, event or community. In this study, a sample of 132 employees at the North West Provincial Department of Public Works and Roads were carefully selected on the basis of fair representation of the entire study population. The group that was chosen had to be representative of all the employees in the department.

3.3.4 Research technique

In order to make contact with the sampled participants, the questionnaires technique was employed. The participants were given questionnaires to fill in their responses and inform the study about their views and opinions about the Proqoute system.

3.4 Context of the study

The proposed study was conducted across the four districts of the at North West Province Department of Public Works and Roads in South Africa. The North West Province is subdivided into four districts, namely, Ngaka Modiri Molema, Bojanala, Dr Ruth Segomotsi Mompati and Dr Kenneth Kaunda. The Department of Public Works is mandated to provide safer transport, provincial land and roads infrastructure management systems for a better life for all. The department employs both skilled and unskilled employees.

3.5 Population and sampling

This section seeks to explain the research population and the sampling techniques that were used during the process of data collection. Generally, a population may be described

as an entire group or elements with common characteristics (Creswell, 2003). Sampling is the process in which a small proportion or subgroup of a population is selected for analysis (ibid).

3.5.1 Population size

Population refers to any group of people or subjects of study which the researcher intends to research (Ivankova, Creswell & Clark, 2012). For the sake of this research, *population* refers to the groups that the research targeted – in this case employees in the North West Department of Public Works, Roads and Transport. The total population of all employees at the North West Department of Public Works and Roads in the Supply Chain Management unit was 200. The employees range from the Member of Executive Council (MEC), Heads of Department (HoD), Chief Directors, Directors, Deputy Directors, Supervisors, and Subordinates. Not all employees at the in the North West Department of Public Works, Roads and Transport were included among the 200 because of their designations, for example unskilled employees in the general manual work force. The sample of this study was drawn from across the entire managerial departments and designations through the sampling technique which is explained below).

3.5.2 Sampling

Sampling generally refers to a process of selecting units or items from a group or a population for the purpose of finding out results in research (Creswell, 2013). It is the subset of the whole population which is actually investigated by a researcher and whose characteristics will be generalised to the entire population. In most research studies in the human sciences, the populations being studied are too large and the researcher must make use of samples (Berg, 2009).

For this study, it was necessary to conduct sampling. It would be difficult and straining for the researcher to gather data from a population size of 200 employees, and the limited resources for this research would not make it possible. The entire population of the North West Department of Public Works, Roads and Transport was to be represented by (N=200) and a sample (n=132) of employees was drawn from the population to be participants with a view to making conclusions about the entire population of the department.

3.5.3. Sampling technique

Sampling techniques provide a range of methods that enable the researcher to reduce the amount of data that needs to be collected, by considering only data from a sub-group rather than all possible cases or elements (Saunders, 2003). The researcher chose to deal with bias by carefully choosing random sampling. All 200 employees were familiar with or had interacted with the Proquote System. Thus, in this study, simple random sampling technique was employed to facilitate a non-biased sampling process, which is critical to this study.

Each employee of the North West Provincial Government had an equal opportunity to be selected as a respondent to the study, as suggested by (Bless & Higson-Smith, 2000:87). This was a partial fulfilment of the quantitative needs of the study, and also added to the validity and reliability of the data collected. However, in certain cases an employee gave the researcher a lead to the next person who could be contacted, in a process known as *snowballing*. This happened in circumstances where the respondent was not certain about something and thus referred the researcher to the next person. Nonetheless, employees were contacted at the discretion of the researcher, who decided which referrals to follow up. This ensured that the study stayed within its proposed objectives.

3.5.4 Sample size

A large sample is more representative but very costly. A small sample, on the other hand, is much less accurate but more convenient (Lester, 2011). Therefore it is important to determine the adequate size of the sample. To this end, calculations were done using the following formula, which corresponds to an online sample size calculator:

$$S = (z^2 (d(1 - d)) / e^2) / 1 + (z^2 (d(1 - d)) / e^2) \text{ where;}$$

S = sample size, P = population size, z = z-score, e = margin of error and d = standard deviation.

Using the target group of 200 employees, a confidence level of 95% and a margin of error of 5%, the researcher arrived at a sample size of 132 employees at the North West

Department of Public Works, Roads and Transport to participate as respondents for this study. This sample was researchable and able to represent the whole target population.

3.5.5 Inclusion criteria

Designations of participants were used to define the inclusion criteria. All participants who were involved in this study met the requirement of being an employee at the North West Department of Public Works and Roads in the SCM department and they have all interacted with or been exposed to the Proqoute System.

3.5.6 Exclusion criteria

Any worker at the North West Department of Public Works and Roads who was not in the SCM department, was excluded. Only 132 participants were used as a sample in this study from a population of 200 workers at the North West Department of Public Works and Roads, and the remaining numbers of employees were excluded from the study.

3.5.7 Recruitment of participants

Participants, who met the criteria for the study, were recruited based on their willingness to participate. The researcher visited potential participants in their offices to invite them to participate in the study as respondents. As explained above, a non-biased sampling technique is key for the research process.

3.6 Data collection and treatment

Data collection generally refers to a process of gathering information from sampled subjects in a target population or group. The researcher defined the parameters of the sample that would be used (see 3.5.5). Below the data gathering process and the tools that were used for data gathering are discussed.

3.6.1 Data collection tools

A questionnaire was designed and administered by the researcher to collect data from the respondents. Both open-ended and closed questions were presented to the respondents.

The researcher administered these questionnaires and was available to provide further explanations if the respondent was uncertain about any of the questions.

The Statistical Package for Social Scientist (SPSS) version 25 was used for numerical data analysis by the researcher. Microsoft Excel was used together with SPSS, particularly for calculations of designing visuals. For reliability and validity, chi-square tests were run to test the hypothesis drawn from the findings.

3.6.2 Questionnaires

Robson (2011: 56) describes a questionnaire as a combination of questions put together on a form to be completed by the respondent in respect of the research project. It is a research instrument comprising a series of questions for the purpose of gathering information from respondents. Although they are often designed for statistical analysis of the responses, this is not always the case. The questions can be open (allow comments) or closed (Yes or No). The main objective of questionnaires is to illicit information (facts or opinions) about the research or phenomenon from respondents who are informed about issue at hand.

Questionnaires have advantages over some other types of research tools because they are cheap, they do not require as much effort from the questioner as verbal or telephone surveys, and they often have standardised answers that make it simple to analyse data (Gillham, 2008). However, such standardised answers may frustrate users. Questionnaires are limited by the fact that respondents must be able to read the questions and respond to them. For some demographic groups it may thus not be practical to conduct a survey by means of a questionnaire (Gillham, 2008).

3.6.3 Questionnaires and administration

The proposed study made use of the Likert Scale type of questionnaire to allow respondents to be both objective and subjective in their response. A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally, the level of agreement or disagreement is measured. It is considered symmetric or "balanced" because there are equal amounts of positive and negative positions (Alvin & Ronald, 2008). The format of a typical five-level Likert item is

Strongly disagree, Disagree, Neither agree nor disagree, Agree, and Strongly agree. The questionnaire was administered to 132 respondents in the organisation.

The Likert Scale type questionnaire was developed and presented to randomly selected employees of the North West Provincial Department of Public Works and Roads, and included both open-ended and closed questions. The questionnaire was hand-delivered due to the proximity case study. The researcher administered each questionnaire to different respondents, who were selected by randomly visiting employees' offices and requesting the respondent's time and patience. Leedy and Ormrod (2015: 78) advises that the single biggest administrative disadvantage of using self-administered questionnaires is the fact that once the questionnaire leaves the interviewer's office, he or she has no control over who, in fact, completes it and whether that person consults with others when completing it.

3.6.4 Data analysis

In this study, the gathered data had to be analysed.

3.6.4.1 Quantitative Data

In as much as the research adopted a quantitative research approach, the questionnaires were designed in a way to provide brief explanations. The data in as much as it can be argued as being qualitative was very instrumental in informing the study and provide an explanation of the statistical data involved. This data which was deduced from the questionnaires in the form of short documented narratives was conceptualised, coded and categorised into themes and sub-themes. This was guided by the grounded theory. Along the lines of the grounded theory, the researcher first summarised all observations into conceptual categories which can be called *themes* and tested the coherence of these categories directly in the research objectives with more observations.

For quantitative data, the Statistical Package for Social Scientist (SPSS) version 25 was used to perform a statistical descriptive analysis. This was done by the researcher, who is proficient in using this research software. Other calculations and cleaning of numerical data was done by means of Microsoft Excel. On numerical analysis, the researcher wanted to establish correlations and relationships of variables.

3.7 Ethical considerations

The participants were assured of the confidentiality of their responses and that their privacy and anonymity would be protected. Collected data was handled with integrity and utmost honesty, especially in terms of the administration of questionnaires. The researcher guarded against bias and persuasion, whilst targeting a high response rate (Bless & Higson-Smith, 2000:193). Participants were ensured that study was solely to be used for academic purposes and that participation in the study was voluntary.

3.7.1 Permission and informed consent

It is important for researchers to have an appreciation of research ethics. The study was carried out with objectivism, to limit all potential risks of bias, manipulation by other motives and oversimplification of certain issues that rose in the course of the research. The researcher entered the field on an educational mission as an extension of the NWU School of Economic Management Sciences. Secondly, permission was sought from the Head of Department of the organisation (HOD).

3.7.2 Confidentiality and anonymity

To maintain the anonymity of the participants, pseudonyms were used in place of participants' real names. All participants remained anonymous. Participants were also informed that the information to be deduced from this study would only be used for academic purposes. The data was strictly protected and none of participants' personal information or identity was revealed.

3.8 CONCLUSION

This chapter entailed all the processes followed in conducting the study. It contemplated the logical sequence that links data to the identified research questions. The research methodology was discussed, providing a more detailed explanation with regard to the population and sampling and the manner in which data was collected and analysed. Ethical issues which might have a bearing on this research study were also considered

and discussed. The next chapter will focus on the presentation of the outcomes of the research project, analyses and interpretation of the research.

This chapter provided a methodological basis on which the research was based on. The research adopted a quantitative research approach with data being gathered through the use of questionnaires. However the questionnaires were designed to make participants to provide brief explanations so as to have clear picture in the analyses of the data.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter is entirely based on the findings of the employee survey that was conducted in four districts of the North West Provincial Department of Public Works and Roads. The purpose of the questionnaires was to assess the effectiveness and efficiency of the Proqoute System, an information tool adopted and implemented to be used on the procurement of public good and services. This chapter contains data presentation, analysis and discussions by means of various statistical methods in order to achieve the objectives of this study.

4.2 SECTION A: Demographic Information

Section A of the questionnaires focused on the demographic component of the participants who took part in the research. It was important in this research to discuss the demographic information of the participants. Demographic information constitutes independent variables that are devoid of manipulation because it is factual information provided by the participants. Lee and Schuele (2010: 43) point out that the term *demographic* was derived from the Greek words *demos* ("people") and *graphy* (picture) and refers to particular characteristics of a population. These characteristics include age, race, gender, ethnicity, religion, income, education, home ownership, sexual orientation, marital status, family size and health and disability status (ibid). Age, gender and level of education are imperative to this study. These independent variables in the sample population need to be statistically analysed to determine if they have any influence on the effectiveness and efficiency of the Proqoute System.

4.2.1 Age

Table 2: Age distribution

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Age	132	40	23	63	40.23	9.884	97.688
Valid N (list wise)	132						

Source: Field data

In a sample of 132 respondents who were interviewed, the youngest employee was 23 years old while the oldest was 63 years old (as shown in the table above). The average age was 40 years. The standard deviation was 9.884 and the variance was 97.688, as calculated by means of the SPSS version 25. There is an age difference of 40 years between the oldest and youngest participant. These statistics are significant for this study, and the finding concerning the average age of employees at the North West Department of Public Works and Roads is particularly meaningful. There is a youthful age group working at the North West Department of Public Works and Roads, which is a healthy situation in terms of the use of ICT, because young people adopt recent technology faster and have less resistance to it than an older generation. All things being equal, the North West Department of Public Works and Roads has an employee base which is undoubtedly literate when it comes to technology.

4.2.2 Gender

Figure 1: Gender distribution

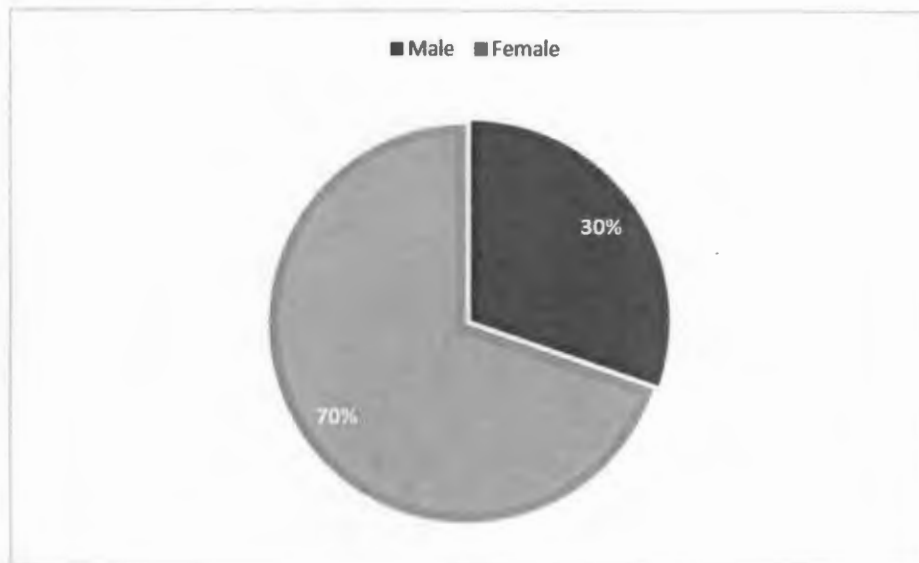


Table 3: Gender distribution

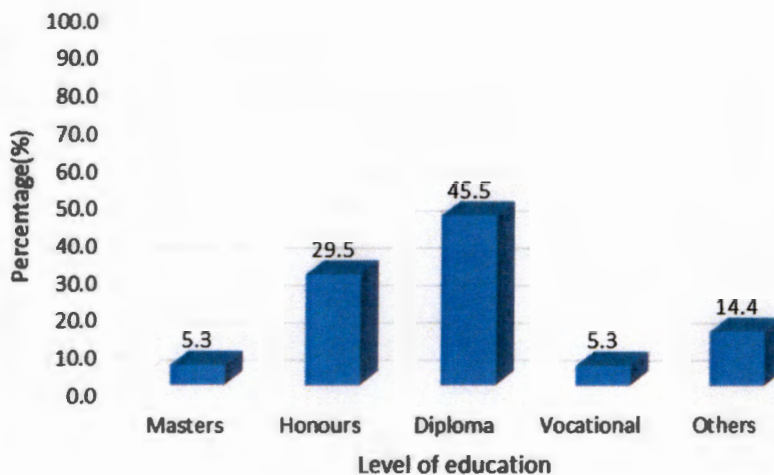
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Male	40	30.3	30.3	30.3
	Female	92	69.7	69.7	100.0
	Total	132	100.0	100.0	

Findings about the participants' gender are illustrated in the table above. The majority of the participants who were sampled were females (70%) while 30% were males. The representation of women in every organisation is very important for the liberal feminism approach. The North West Department of Public Works and Roads has a fair representation of women in key decision-making roles.

4.2.3 Level of education

Level of education was an independent variable in this study, because every respondent e at the North West Department of Public Works and Roads has a qualification in a certain field of speciality.

Figure 2: Level of education



The illustration above depicts the highest education level attained by the respondents who were selected across the 4 districts of the North West Department of Public Works and Roads. As shown, respondents with diplomas dominate the sample (45.5%), followed by holders of honours degrees. 14.4% of the sample held other educational qualifications, mostly a matric certificate. 5.3% of respondents had master's degrees, and 5.3% had vocational qualifications. Thus, the majority of the participants in this study have a qualification of some sort in their fields of speciality.

Among those who chose to reveal their designation, were the budget analysts, clerks, state accountants, secretaries and directors. In essence, these are the people who directly or indirectly operate the Proqoute System in the daily execution of their tasks. These statistics are significant because a number of studies on ICT have found a positive relationship between education and a successful adoption of ICT innovations. It was important for this study to establish whether these statistics translate into the effective and efficient use of the Proqoute System by the North West Department of Public Works and Roads when public goods and services are outsourced.

4.2.4 Summary of Section A



The demographics of the participants used in this research provide a healthy and strong foundation for the research to gather relevant information. The fact that the average age of the participants is 40 years, means that they are an age group that is likely to be open-

mindful towards and appreciative of the use of technology in the workplace. Furthermore, almost 70% of the participants have higher education qualifications.

4.3 SECTION B: The efficiency and effectiveness of the Proquote System

The main objective of this study was to assess the effectiveness and efficiency of the Proquote System in the SCM at the North West Department of Public Works and Roads. Firstly, it was necessary to establish whether the respondents were literate in terms of the Proquote System, how frequent they interacted with the system and whether they had received any formal training about the system. The outcome will make it possible for the researcher to make a logical conclusion about the effectiveness and efficiency of the Proquote System as it seen by the respondents.

4.3.1 Training in Proquote System

Question 6: Have you received training on the Proquote System?

Of 132 respondents who participated in this study, 36.4% reflected that they received training on the Proquote System while 63.6% did not receive any formal training on the system. The number of untrained employees is of great concern. These employees are qualified and experienced, but not properly trained in the Proquote System, and this leads to the question about how effective and efficient the system can be if it is operated by untrained personnel?

4.3.2 Frequency of use of Proquote System

Question 7: How frequent do you interact with the Proquote System in the execution of your daily duties?

Only about a third of the respondents who have access to or are supposed to use the Proquote System are trained to do so. Question 7 intended to establish the frequency with which the employees interact with the system in the execution of their daily tasks.

Table 4: Interaction frequency with Proqoute system

		Frequency	Percentage	Valid Percentage
Valid	On specific tasks	86	65.2	65.2
	Daily	20	15.2	15.2
	Monthly	6	4.5	4.5
	Never	20	15.2	15.2
	Total	132	100.0	100.0

Source: Field data

As illustrated in Table 4 above, employees do not frequently interact with the system in the execution of their daily tasks. The majority (65.2%) only interact with the Proqoute System on specific tasks, and 15.2% interact with the system on a daily basis. 15.2 % indicated that they have never interacted with this system, while a minority (4.5%) interact with the system on a monthly basis. There is a probable relationship between training and interaction with the Proqoute System which needs to be statistically described.

Table 5: The relationship between training and interaction with the Proqoute System

		Interaction with Proqoute System	Training on Proqoute System
Interaction with Proqoute System	Pearson Correlation	1	.020
	Sig. (2-tailed)		.817
	N	132	132
Training on Proqoute System	Pearson Correlation	.020	1
	Sig. (2-tailed)	.817	
	N	132	132

(Source: Field data)

Table 5 above illustrates that there is a positive relationship ($p < 0.05$) between training and interaction with the Proqoute System, in line with the Pearson correlation. This means that only a few trained individuals are the ones who interacted with the Proqoute System more frequently. It is possible that the more experienced employees are the ones who received training and who interact with the Proqoute System on a more regular basis. Therefore, a correlation test was used to determine whether these variables are related.

A correlation test will also determine whether efficient and effective use of the Proqoute system will be achieved. In various studies, having an experienced workforce yields good

results as tasks will be executed by the book but that does not relegate training as it capacitates the employees.

4.3.3 Employee experience at the North West Department of Public Works and Roads

The table below shows the employee experience at the North West Department of Public Works and Roads. The majority of the participants (25%) have 1 – 5 years of experience, followed by those with 10 – 15 years of experience (21.2%). Respondents with experience of 20+ years make up 20.5% of the sample, while 19.7% had 5 – 10 years of experience and 13.6% had 15 – 20 years of experience.

Table 6: Employee experience at the North West Department of Public Works and Roads

		Frequency	Percentage	Valid Percentage
Valid	1-5	33	25.0	25.0
	5-10	26	19.7	19.7
	10-15	28	21.2	21.2
	15-20	18	13.6	13.6
	20+	27	20.5	20.5
	Total	132	100.0	100.0

(Source: Field data)

The statistics in Table 6 above show that the majority of the employees at the North West Department of Public Works and Roads are experienced. A significant number of respondents reported that they had at least 5 or more years of experience working at the North West Department of Public Works and Roads. However, even employees with many years of experience will need to undergo training with regard to new systems that are introduced at the workplace. Long years of experience can also sometimes result in resistance against the introduction of new systems and this could undermine the SCM.

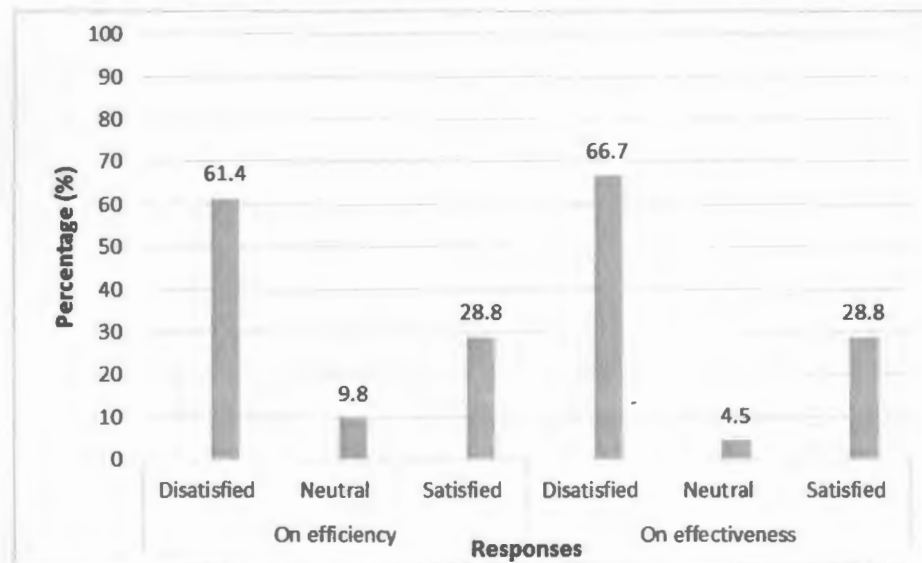
4.3.4 Response rate on efficiency and effectiveness of the Proqoute System

Question 9: On a scale of 1-10, rate the efficiency of the Proqoute system (1 = dissatisfied; 10 = satisfied).

Question 10: On a scale of 1-10, rate the effectiveness of the Proqoute system (1 = dissatisfied; 10 = satisfied).

In the administered questionnaires, interviewees were asked to rate the effectiveness and efficiency of the Proqoute System on a scale of 1 to 10 (1>4 dissatisfaction; 5> neutral; 6>10 satisfied). 61.4% of the respondents reported dissatisfaction with the *efficiency* of system, while 28.8% were satisfied with it. 9.8% of the respondents were neutral on this issue. 66.7% of the respondents were dissatisfied with the *effectiveness* of the system, while 28.8% were satisfied and 4.5% were neutral in this regard (see Figure 3 below).

Figure 3: Response rate on efficiency and effectiveness of the Proqoute system



(Source: Field data)

Figure 3 above shows that most respondents regard the Proqoute System as being neither effective nor efficient. The number of respondents who are dissatisfied with the Proqoute System is much greater than the number of those who are satisfied with it. It is therefore necessary to follow up this response, to learn why this trend was found among respondents.

Respondents indicated that the Proqoute System is inconsistently implemented. The operation of the system changes from time to time, and this results in manipulation of the system. Respondents were also asked whether the Proqoute System operates in its

proposed framework. Table 2 below depicts the responses of the participants to this question.

Table 7: Response rate on if the Proqoute system operates in its framework

		Frequency	Percentage	Valid Percentage
Valid	Yes	39	29.5	29.5
	No	93	70.5	70.5
	Total	132	100.0	100.0

(Source: Field data)

Table 7, above shows that the majority of the respondents (70.5%) are of the opinion that the Proqoute System is not implemented within the proposed framework, whilst 29.5% believes that the Proqoute system is implemented in its framework. This translates to inefficiency and ineffectiveness of the entire system, as its ultimate objectives will not be achieved. One responded remarked that,

“... Suppliers are no more rotating, so it is becoming meaningless, we don’t even recognise its objectives since implementation.”

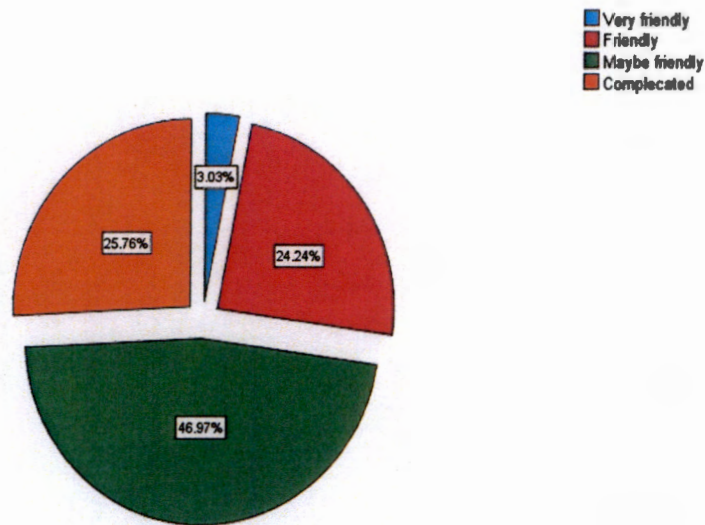
If the objectives of the system are not constantly taken into account, the implementation of any system or programme will be unstable and directionless. This is detrimental to the efficiency and effectiveness of the Proqoute System.

4.3.5 User-friendliness of the Proqoute System

Question 11: Do you think the Proqoute System is user-friendly?

Participants were asked if the Proqoute System is user-friendly. Figure 4 below represents the responses of the participants to this question. The majority (59.97%) are not sure whether the Proqoute System is user-friendly, followed by 25.76% of respondents who describe the system as complicated. About 24.24% of the respondents said the Proqoute System was user-friendly, while 3.03% believed that it was very user-friendly.

Figure 4: Responses regarding the Proqoute System’s user-friendliness



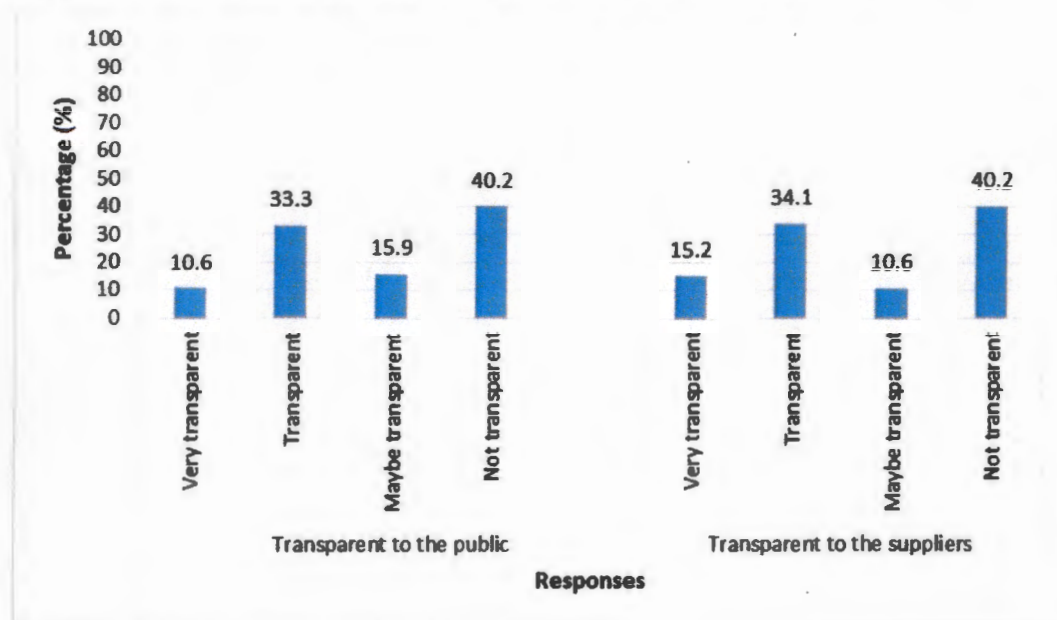
The inconsistency with which the system was implemented, could possibly account for the dissatisfaction with the system. The finding that the majority of the respondents are dissatisfied with the Proqoute System, however, raises great concern about its effectiveness and efficiency.

4.3.6 Proqoute System and transparency

Question 12: Do you think the Proqoute system has been able to transparently reach out to suppliers?

The majority of the participants are of the opinion that the Proqoute System is not transparent, neither to the suppliers nor to the public in general. The responses with regard to the transparency of the system are shown in Figure 5 below. 40.2% of the participants believed that the Proqoute System is not transparent to its major stakeholders, namely the suppliers and the general public. 33 – 34.1% believed that the Proqoute is transparent, and 10 – 15.2% found it “very transparent”. 10 – 15.9% were undecided on this issue. This is significant for this study, as it might explain why the majority of the respondents feel the Proqoute System is not being implemented adequately and therefore not efficient and effective to deal with supplier rotation, nepotism and corruption in the procurement of public goods and services at the North West Department of Public Works and Roads.

Figure 5: Responses on the Proquote System's transparency



(Source: Field data)

4.3.7 The influence of the Proquote system in decision-making

Question 14: Do you think the Proquote system influenced decision-making on public goods purchased or serviced outsourced?

Below is a table showing participants response rate when they were posed a question asking about if the Proquote system influences decisions on the selection of suppliers at the North West Department of Public Works and Roads.

Table 8: The influence of the Proquote System on decision-making

	Frequency	Percentage	Valid Percentage
Valid			
Maybe Influential	15	11.4	11.4
Not influential	71	53.8	53.8
Total	132	100.0	100.0

(Source: Field data)

Table 8, above reflects that 53.8% of respondents are of the view that the Proquote System does not influence decision-making, while 34.8% think it does. 11.4% of the participants remained neutral on the issue. It is therefore concluded that the Proquote

System is inefficient and ineffective, as decisions could be made by individuals without referring to the system. Thus, the Proqoute System is open to manipulation.

4.3.8. The Proqoute System and corruption

Question 15: Do you think the Proqoute system has been effective in reducing corruption and fraud?

Table 9 below clearly shows that the majority of participants at the North West Department of Public Works and Roads (54.5%) do not think that the Proqoute System effectively dealt with corruption since its implementation. 20.5% of the respondents believed that the Proqoute System effectively dealt with corruption in the procurement of goods across the 4 districts of the North West Department of Public Works and Roads, and 14.4% thought it did so very effectively. 10.6% were undecided.

Table 9: The Proqoute system on corruption reduction

		Frequency	Percentage	Valid Percentage
Valid	Very effective	19	14.4	14.4
	Effective	27	20.5	20.5
	Maybe effective	14	10.6	10.6
	Not effective	72	54.5	54.5
	Total	132	100.0	100.0

(Source: Field data)

One of the objectives of the implementation of the Proqoute System is to avoid manual quotes, which are open to manipulation and corruption. It has also been found in the study that the Proqoute System does not significantly influence decision-making about suppliers. This renders the system inefficient and ineffective.

4.3.9 Feedback on the Proqoute System

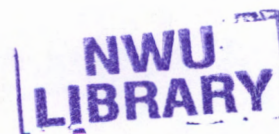


Table 10: Feedback on the Proqoute System

		Frequency	Percentage	Valid Percentage
Valid	Positive	6	4.5	4.5

Somewhat positive	37	28.0	28.0
Negative	68	51.5	51.5
Somewhat negative	21	15.9	15.9
Total	132	100.0	100.0

(Source: Field data)

According to Table 10 above, the data analysed revealed that across all 4 districts of the North West Department of Public Works and Roads there was negative feedback on the Proqoute System. About 51.5% of the participants believed that the North West Department of Public Works and Roads have received negative feedback from suppliers and the public in general, with 15.5% reporting that feedback was somewhat negative. 28% thought that the feedback was somewhat positive, with 4.5% believing that it was positive. One respondent noted that “[the] supplier response is always below satisfactory”. Negative feedback leads to a questioning of the efficiency and effectiveness of the entire system. If the stakeholders (thus, the suppliers and the general public) are condemning the system, it means that they find system to be ineffective and inefficient.

4.3.10 Summary of Section B

The general trend that has been evident from the statistical findings in the Section B, in which the focus was on assessing the opinions and attitudes of the North West Provincial Department of Public Works and Roads, has been somewhat negative. Respondents have negative perceptions and attitudes with regard to the Proqoute System, which might likely be the result of its current weaknesses and loopholes, which make it prone to manipulation. The fact that the respondents feel that the Proqoute System plays a minor role in making decision with regard to choice of procuring goods and services from potential suppliers, may mean that it is only used for purposes of formality, but not in a manner that its initial intended goals and objectives can be achieved.

4.4 Section C: Detailed Analyses of Proqoute

4.4.1 The opportunities, challenges and recommendation to the Proqoute System

In the interviews at all 4 districts of the North West Department of Public Works and Roads, there was an acknowledgement and appreciation of both the negative and positive

outcomes of the Proqoute System. However, the negative outcomes outweigh the positives outcomes because they were more based on experience and facts than the idealistic positive outcomes. Table 11 below summarises the opportunities and challenges of the Proqoute System.

Table 11: Opportunities and challenges for the system

Opportunities	Challenges
User-friendly Promotes transparency and accountability It facilitates quick payments from the suppliers Time management	Manipulation Inconsistency of implementation The system sometimes goes down (not operational) It is not effectively monitored and audited

4.4.2 Challenges of the Proqoute System

Manipulation

The survey was carried out across the 4 districts of the North West Department of Public Works and Roads to identify the major challenges facing the Proqoute System. The word *manipulation* was frequently used by the respondents. Most respondents reported that the Proqoute System was vulnerable to human manipulation. 96 of the 132 respondents in the sample said that the system was strongly manipulated by the employees and that they resort to manual quotes when the system is down. The respondents made the following remarks, among others:

- *The Proqoute system was put in place to facilitate rotation of suppliers, reduce corruption and promote accountability, but simply because the system can be manipulated by employees, we have been seeing the same suppliers for months.*
- *... because the system is not always operational, it results in quotations being manually requested and thus having negative effect on Department compliance.'*
- *In my opinion I think the Proqoute system in our Department has not reached its purpose and rotation amongst suppliers because clearly one supplier can be sourced fourth to five time in a month! Hence, I think that the Proqoute can be easily manipulated to its own course.*

- *Proquote was meant to rotate suppliers electronically, but to my experience it can be easily manipulated to change suppliers on system or source one supplier continuously without rotation.*

As long as the Proquote System can be manipulated, it will not perform to expectation and will therefore be ineffective and inefficient. One respondent observed that using one supplier 4 to 5 times in a month defeats the purpose of the Proquote System to facilitate supplier rotation. The use of manual quotes when the system is down and the practice of repeatedly sourcing from the same supplier in a month, increase chances of corruption and bribes. These practices will have dire consequences for the employees in question if the Proquote System is audited. Clearly, the Proquote System is not efficient and effective for the purchasing of public goods at the North West Department of Public Works and Roads.

A respondent mentioned that politics play a critical role in the selection of suppliers bypassing both the Proquote System and the SCM procedures that need to be followed:

"They are no positive outcomes and they won't be any since politics have an influence in government procurement."

The favouring of one supplier based on political affiliation comes down to nepotism and a serious conflict of interests – these are challenges that could be minimised by the Proquote System. The efficiency and effectiveness of the Proquote System is, however, being eroded by the current practice of purchasing of public goods at the North West Department of Public Works and Roads.

4.4.3 Summary of Section C

It was found in the interviews that the challenges of the Proquote System largely stem from the loopholes that allow for the manipulation of the system. This has for example led to instances where the same suppliers were repeatedly used, instead of a model of rotation. Responses to the questionnaire also indicate that political influences also contribute to the challenges and weaknesses associated with the Proquote System.

4.5 Conclusion

The chapter provided the findings the research managed to gather to influence and inform the study to have an appropriate conclusion. It is critical to state that the questionnaires were designed from the objectives of the study.

CHAPTER 5

DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter 5 will present discussions and recommendations stemming from the empirical findings in the previous chapters of this research. This chapter summarises the research and gives conclusions that are based on its findings. The main research question is answered, namely whether the adoption of the Proquote System has had an effect on the effectiveness and efficiencies of the supply chain processes, according to this case study of the North West Provincial Department of Public Works and Roads.

The research has found that although ICT tools are ideally suited and necessary for the process of outsourcing and acquisition, its impact and relevance are compromised by external circumstances, such as political considerations, corrupt motives, negative attitudes and expecting of untrained employees to use the ICT tools. Even if an ICT tool is technically well designed, external factors can determine how successful the tool will be to achieve its set objectives.

5.2 DISCUSSION OF THE FINDINGS

The thrust of this chapter section is the integration of the findings from the interviews and questionnaires. The research findings from the data collection tool which was used, are in this section classified into categories such as corruption, manipulation, political considerations and employee attitudes. The key findings and observations in the study are summarised below:

- Challenges associated with corruption were found to be a factor that thwarts the effectiveness of the Proquote System. Employees appeared to be very wary of corrupting factors in the awarding of opportunities for government supplies to particular providers. As a result, the Proquote System does not function as a tool for transparency and fairness to all prospective suppliers as was originally intended. It may imply that the Proquote System has become irrelevant or that changes are needed to reduce the corruption tendencies that are associated with the procurement processes. It must be taken into consideration that the system was

adopted specifically to eliminate or at least reduce the corruption which is generally associated with procurement processes in South Africa and the world at large.

- Political interference, which can be linked to the above-mentioned factor of corruption, was also cited frequently as a critical factor which has had a bearing on the efficiency and effectiveness of the system. Respondents observed that management might utilise the Proqoute System in their decision-making, but that the political players would generally overrule such decisions for political reasons. It is important to note the views of respondents that without instituting effective measures that seek to reduce political interference, the system will likely remain an inoperative tool. Political interference particularly involves bypassing proper SCM processes, and given the current political climate in the country, politics and political ideologies significantly influence public procurement processes – this renders the use of ICT tools such as Proqoute irrelevant.
- Manipulation is an aspect that can be linked to both the above-mentioned factors (corruption and politics). It was often mentioned by the respondents. Participants reported that the Proqoute System leaves room for manipulation, either through corruption or political pressure. Respondents indicated that it constantly happens that the same business repeatedly receive business opportunities at the expense of others. The Proqoute System apparently cannot avoid or limit repeated business opportunities going to the same companies or enterprises. The initial idea intention with the adoption and use of the Proqoute System by the North West Provincial government was to provide equal public procurement opportunities to all private entities. The fact that the system is being manipulated without effective measures to limit this unfair favouring of certain providers greatly reduces the chances and capacity of the system to be reliable, efficient and effective.
- Employee attitudes are a critical component in assessing the impact of any system. The respondents revealed that the workforce of the North West Provincial Department of Public Works generally has a negative perception of the Proqoute System. This negative perception could be strongly influenced by the fact that the Proqoute System – due to external factors such as the ones mentioned above – already has been seriously compromised and is deemed ineffective. As was mentioned in Chapter 3, only about 30% of the workforce in the SCM operations received training on using the Proqoute System. This could imply that the system is probably not a priority and that employees are reluctant to engage with it and invest their time in training on using it. However, it is an important statistical finding that

the majority of the employees are dissatisfied with the system's efficiency (61%) and effectiveness (66,7%). The study found that 53% of the employees feel that the Proquote System has no bearing on and does not contribute to decision-making in the procurement processes.

5.3 ASSESSMENT OF THE RESEARCH IN THE CONTEXT OF THE AIM AND OBJECTIVES OF THE STUDY

The aim of the study was to:

- Investigate whether the introduction of the Proquote System in the North West Provincial Department of Public Works and Roads has yielded its intended outcomes of improving effectiveness and efficiency in the procurement process.

The secondary objectives that the research sought to meet, were:

- Assess Proquote's operational framework and the level of importance and reliability of the Proquote System for the North West Provincial Department of Public Works and Roads.
- Investigate the perception (among employees and potential suppliers) towards the system and employee capacity to use the system in their activities.
- Determine the influence that the Proquote System might be having on decision-making in the procurement processes.
- Determine the extent to which the Proquote System is contributing towards the reduction of fraud and corruption in the North West Provincial Department of Public Works and Roads.

The research objectives were met through the following ways:

Objective 1: Proquote's operational framework, level of importance and reliability

In the quest to assess Proquote's operational framework, value and reliability to the North West Provincial Department of Public Works and Roads, a theoretical foundation had to be instituted which provided a background for adopting and implementing the Proquote System, as well as other ICT tools that are used in the SCM processes. Chapter 2

provided the theoretical foundation for measuring the value and importance of the iCT and it expanded on the motivations and background which necessitated the adoption of such tools. This exploring was done in the context of the objectives and aims of the ICT tools. Questions in the questionnaires were used to gather information about how the Proqoute System was designed, the framework in which it operates and the value and importance it has for the North West Provincial Department of Public Works and Roads.

Objective 2: Investigate perceptions and capacity with regard to the adoption and utilisation of the Proqoute system.

This objective was met by first addressing it from a theoretical aspect, through assessing the general perceptions of governments, employees and the prospective suppliers. Past researches were reviewed to obtain a theoretical structure before adapting it to the context of the Proqoute System. The research met this objective, as it managed to explore and assess perceptions about the use of the Proqoute System. The investigation further sought to understand the factors that influence such perceptions.

With reference to the findings of this study only 3.3 % of the respondents had a strong positive view of the Proqoute system with regards to its user-friendliness aspect, showing that employees' perceptions are somehow negative towards the system and that they find it a challenge to use it.

Objective 3: Assessing the contribution of the Proqoute System towards decision-making.

This crucial objective was met. As in the case of the other objectives, the research first gave a theoretical foundation for the context in which the contribution of the Proqoute System towards SCM operations decision-making could be analysed. A review was done to understand how relevant other ICT tools were with regard to their contribution to decision-making. The study then focused on the context of the Proqoute System and found that its contribution to decision-making is limited by external factors that affect the process. 53% of the respondents view the Proqoute as not very influential with regards to procurement decision making, this is as a result of the fact that the system itself has

systematic weaknesses which prevent it from effectively contributing and influencing the procurement processes.

Objective 4: Assess the contribution of the Proquote System towards reducing fraud and corruption during procurement processes.

The selected theoretical foundation emphasised that most ICT tools are adopted with the motive of reducing corruption and fraud, which are normally the primary factors that hamper proper procurement processes. Likewise, the Proquote System was adopted for these same reasons. Objective 4 was met in that the research explored this area and found weaknesses in the system which left room for manipulation of the system. Other external factors, such as political interferences, also lead to corruption and an override of the Proquote System.

The research findings shows that close to 55% of the respondents are of the view that the Proquote system is not effectively as intended contributing to the curbing of fraud and corruption. Therefore basing from this study findings, it is critical to note that if more than half of the employees view the system as inefficient in dealing with fraud and corruption, it then fundamentally brings about the fact that the Proquote system does have challenges that require attention and review.

5.4 Conclusion

Below, the conclusions of this studied are explained.

5.4.1 The Proquote System has the potential to impact on effectiveness and efficiency in the SCM operations of the North West Provincial Department of Public Works and Roads.

The adoption and use of ICT tools such as the Proquote System should improve efficiency, which is necessary at all levels of governments. Bureaucratic tendencies which are generally associated with governments affect business operations and the citizenry at large. In this context this research has found that the Proquote System has the potential to improve efficiency and effectiveness (in this case in the North West Provincial Department of Public Works and Roads). The system itself needs to be upgraded and measures must

be put in place to make it a more effective and efficient tool against fraud and corruption. The latter are impediments to efficiency in government operations.

Nevertheless, the system has made an impact in that it provides prospective suppliers a platform to register on the database and to declare their interests and intentions of doing business with the government. This saves time both for the prospective supplier and the government, because government can now easily identify entities who wish to engage with government in supply and service transactions. It ensures that the process is conducted in a fair, competitive and honest manner, free of corruption and other influences.

5.4.2 Proqoute can effectively impact on socio-economic Transformation

The South African public procurement process is driven and influenced by the need to use it as a tool to achieve the social and economic transformation goals of the ruling government of the day. This has been explained in the previous chapters of the research and it has an impact on the design and operational capacity of the Proqoute System. Socio-economic transformation entails the provision of procurement opportunities to previously marginalised groups of the population, with the aim that they should also benefit from the economically and socially (Ambe, 2016).

The Proqoute System in this regard has the potential to contribute to the socio-economic transformation concept, which strongly influences South African public procurement processes. Much progress has been made by the government towards achieving such goals, especially with regard to the equitable distribution of procurement opportunities to companies on the database, rather than favouring a limited number of entities.

5.5 Recommendations

The following recommendations are made on the basis of this study.

5.5.1 Reduce opportunity for manipulation

From a technical point of view the Proqoute System needs to be updated to avoid manipulation such as unfair distribution of procurement opportunities to businesses. Currently it is no more than a register or database where businesses are listed. Proper

measures need to be taken to ensure fair distribution, free from manipulation and corruption.

5.5.2 Reduce political interference

The Department and the Government at large have to take the necessary steps to minimise the threat of political interferences which has had an effect on the Proqoute System. The procurement processes should incorporate political considerations as well as professional and operational considerations. Political interference largely aims to control procurement processes to achieve set political goals. Such competing forces need to be consolidated and incorporated into the operational framework of the Proqoute System.

5.5.3. Employee attitudes

The department and the government at large have to take the necessary measures to improve the attitudes of civil servants towards the Proqoute System and various other ICT tools. These tools need to be made more effective and employees need to be assisted in their daily dealings with them. The problem does not lie with failure on the part of government to adopt new technology in its operations. It rather lies with the unwillingness to meaningfully embrace this new technology and taking into account its influence on decision-making. The more technology is used in decision-making, the more employees will come to value it and to have a positive attitude towards it. This will ultimately improve government efficiency and effectiveness.

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Appendix A: Questionnaire

Thank you for participating in this study. My name is M Mabeleng, a final year student at the North West University studying towards MBA in Faculty of Economic Management Sciences. I am carrying out a study to investigate: **The case of Proquote System on Supply Chain Management at North West Provincial Department of Public Works and Roads.** I am kindly asking for your assistance in responding to the questions in this interview and the information generated from this study will be used for academic purposes only.

Section A (Tick and write as appropriate)

Demographic information

1. Age _____
 2. Gender Male ☐ Female ☐
 3. Designation _____
 4. Years of experience at the Department of Public Works and Roads
 1. 1 to 5 ☐
 2. 5 to 10 ☐
 3. 10 to 15 ☐
 4. 15 to 20 ☐
 5. 20 and above ☐
 5. Highest Education/Training
 1. Doctorate ☐
 2. Masters ☐
 3. Honours ☐
 4. Diploma ☐
 5. Vocational ☐
- Others (specify) _____
6. Have you received training on the Proquote system?
 1. YES ☐
 2. NO ☐

Section B (Tick and write as appropriate)

Efficiency and effectiveness of Proquote system

7. How frequent do you interact with the Proquote system in your daily execution of duties?
 1. Regular basis ☐
 2. On specific tasks ☐

- 3. Daily ☐
- 4. Weekly ☐
- 5. Monthly ☐

8. How do you rate yourself when using the Proqoute system?

- 1. Professional ☐
- 2. Working experier ☐
- 3. Average ☐
- 4. Minimum ☐
- 5. Not experienced ☐

9. On a scale of 1 to 10, rate the efficiency of the Proqoute system (1 = dissatisfied; 10 = satisfied)

10. On a scale of 1 to 10, rate the effectiveness of the Proqoute system (1 = dissatisfied; 10 = satisfied)

11. Do you think the Proqoute system is user friendly?

- 1. Very friendly ☐
- 2. Friendly ☐
- 3. Maybe friendly ☐
- 4. Complicated ☐

12. Do you think the Proqoute system has been able to transparently reach out to suppliers?

- 1. Very transparent ☐
- 2. Transparent ☐
- 3. Maybe transpare ☐
- 4. Not transparent ☐

13. Do you think the Proqoute system has been transparent to the general public?

- 1. Very transparent ☐
- 2. Transparent ☐
- 3. Maybe transpare ☐
- 4. Not transparent ☐

14. Do you think the Proqoute System influenced decision-making on public goods purchased or services outsourced?

- 1. Very influential ☐

- 2. Influential ☐
- 3. Maybe influential ☐
- 4. Not influential ☐

15. Do you think the Proquote System has been effective in reducing corruption and fraud?

- 1. Very effective ☐
- 2. Effective ☐
- 3. Maybe ☐
- 4. Not effective ☐

16. What feedback did you get from suppliers and the general public on the Proquote System?

- 1. Positive ☐
- 2. Somewhat positive ☐
- 3. Negative ☐
- 4. Somewhat negative ☐

Section C (Tick and write as appropriate)

17a. Do you think the Proquote's operational framework is still within its targeted aim and objectives since implementation?

- 1. YES ☐
- 2. NO ☐

b. Why?

18. What are the immediate positive outcomes of the Proquote system that you are aware of since implementation?

18b. What are the immediate negative outcomes of the Proqoute system that you are aware of since its implementation

19. What challenges have you met so far in your interaction with the Proqoute system in the day to day execution of your duties?

20. What has your department done so far to maintain the correct and effective use of the Proqoute system?

21. In your opinion, what do you think should be done to minimise challenges faced using the Proqoute system for the benefit of users, suppliers and the general public?

THANK YOU FOR YOUR PARTICIPATION