UNIVERSITY OF KWAZULU-NATAL

Perceived factors affecting the adoption of electronic procurement in the Mpumalanga Provincial Treasury

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DECLARATION

I, **Nchabeleng Lewane Success (222128727)** declare that this dissertation entitled: Perceived factors affecting the adoption of e-procurement in the Mpumalanga Provincial Treasury is hereby submitted to the University of KwaZulu-Natal, in the fulfillment of Masters of Supply Chain Management degree and has not been previously submitted for any other degree or examination at this Institution or any other university. This is my work in both conception and execution. All the sources that I have made use of or quoted have been duly acknowledged through complete references.

08/02/24

Nchabeleng Lewane Success **Date**

DEDICATION

I dedicate this dissertation to my family. I love you deeply with all my heart. A special feeling of gratitude to my husband Godfrey Talane and loving parents, my beloved father Mpe Nchabeleng, and my beloved mother Dihubane Nchabeleng. Thank you for your patience as I pursued and completed this degree. I am grateful for always telling me that I could achieve anything I chose to do. Your words of wisdom and encouragement to commit remain in my ears. Thank you for loving and taking care of my children during this journey**.** To my sons, Nyakallo and Baatile Talane, and my daughter, Ontetlile Talane, my precious gifts from the Lord, your little smile sustains me. Finally, I dedicate this work to the Lord, Almighty. All that I have, all that I am and all that I do is because of and for you.

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ABSTRACT

The digital revolution in the 21st century is regarded as the channel of corporate development that resulted in substantial changes in the way procurement is handled and managed within organisations. Public organisations have since become increasingly reliant on information and communication technologies. Given these developments, new forms of electronic commerce have also emerged; the most prominent form of electronic commerce is electronic procurement. By early 2000 developed economies began the implementation of e-procurement. In contrast, in emerging countries specifically in Africa, electronic procurement has not been widely adopted in government departments, including in South Africa. The purpose of this study was to investigate the perceived factors that influence the adoption of electronic procurement and further establish employees' perceptions of electronic procurement in the Mpumalanga Provincial Treasury. An overview of procurement in the South African public sector was presented in a literature review, shedding light on the challenges and opportunities within this particular environment. The study relied on a framework for successful implementation of electronic procurement espoused by Gunasekaran and Ngai.

A structured questionnaire was used to collect data from a sample of 33 personnel in Supply chain, finance, and ICT using a quantitative descriptive approach. Descriptive statistics, including principal component analysis and Cronbach's alpha, were performed using the Social Sciences Statistical Package (SPSS) and an Excel spreadsheet. The results indicate that there would be a significant reduction in paper consumption if electronic procurement was adopted in the department. Furthermore, the results indicate that there is a strong influence on the promotion of visibility in supply chain operations, although electronic procurement is prone to challenges. The results show that the availability of supporting infrastructures, the fear of cyber security, and the lack of management support were found to be the predictor of the lack of adoption of electronic procurement. Furthermore, due to the potential benefits of the adoption of electronic procurement, the results indicate that other procurement expenses, cost reduction, and increased supplier participation and competitiveness were found to be positive benefits of the adoption of electronic procurement. These findings have significant implications for the Mpumalanga Provincial Treasury's adoption of electronic procurement. Suggestions for further studies on the adoption of electronic procurement were suggested.

Key terms: Procurement, E-procurement, Adoption, Public Sector, Supply Chain

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LIST OF ABBREVIATIONS

AI	: Artificial Intelligence
ANOVA	: Analysis of Variance
BEE	: Black Economic Empowerment
B-BBEE	: Broad-Based Black Economic Empowerment
B2B	: Business-to-business
CSD	: Central Supplier Database
CFO	: Chief Financial Officer
DTI	: Department of Trade and Industry
EDI	: Electronic data interchange
ERP	: Enterprise resource planning
EPS	: E-procurement systems
GSSC	: Gauteng Shared Services Centre
GDP	: Gross Domestic Product
HDI	: Historically disadvantaged individuals
SHRM	: Human Resource Management
ICT	: Information Communication and Technology
MANCO	: Management Committee
MPT	: Mpumalanga Provincial Treasury
PPPFA	: Preferential Procurement Policy Framework Act
PCA	: Principal component analysis
PFMA	: Public Finance Management Act
RSA	: Republic of South Africa
SMME	: Small, medium and micro enterprises

SPSS	: Statistical package of the Social Sciences
SCM	: Supply chain management
SAP	: System Administrative Processes
SAAP	: Systems, applications and products
UN	: United Nations
UKZN	: University of KwaZulu-Natal
WWW	: World Wide Web

CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1. Introduction

The digital revolution in the 21st century is regarded as the channel of corporate development that resulted in substantial changes in the way procurement is handled and managed within organisations. The drive towards the adoption of electronic technologies is aimed at improving the efficiency and effectiveness of organisational processes, particularly procurement. Chen, Bretschneider, Stritch, Darnall, and Hsueh (2022) state that even public organisations have since become increasingly reliant on information and communication technologies. Given these developments, new forms of electronic commerce have also emerged; the most prominent form of electronic commerce is electronic procurement [e-procurement] (Waithaka & Kimani, 2021). E-procurement is a digital platform used by organisations to centralise, optimise, and streamline purchasing processes (Barahona & Elizondo, 2014; Waithaka & Kimani, 2021). Generally, procurement plays an important role in the supply chain network, making it the heartbeat of any organisation. Public sector procurement refers to procurement by ministries, government departments, provincial departments, local government, and state corporations (Addo, 2019). In essence, private and public procurement cannot be expected to yield the same results, since public procurement aims to achieve multiple objectives. Addo (2019;44) describes various reasons such as 'efficiency, fairness, accountability, transparency, and respect for international obligations where more than one country is involved'.

Chebet and Kihara (2022) state that the purpose of adopting e-procurement as a strategic operation of the organisation is to eliminate the difficulties associated with traditional procurement procedures and to promote more integrated and simple processes. E-procurement systems represent a crucial advancement in the purchasing procedure that offers advantages to the organisation through increased efficiency and lower costs, increased prospects for collaboration, and improvements in internal service and status of the purchasing function (Addo, 2019). Given the benefits that organisations can benefit from when adopting e-procurement systems, most of them should have adopted them. This study investigated the perceived factors that affect the adoption of electronic procurement in the Mpumalanga Provincial Treasury (MPT). The other sections of this chapter focus on providing the background of the study, problem statement, research objectives, and the research questions.

The significance of the study, rationale, theoretical framework synopsis, and brief research methodology including the delimitation of the study, are discussed in this chapter.

1.2. The background of the study

Globally, e-procurement is becoming a more popular way of doing business (Oteki, 2019). Research on the adoption of electronic procurement across all industries. In the context of developed economies such as the United States of America, by early 2000 the country had begun the implementation of e-procurement (Ahmad, Aljafari & Venkatesh, 2019). On the contrary, in emerging countries specifically in Africa, e-procurement has not been widely adopted in government departments including in South Africa. For the slow implementation of e-procurement, the World Bank identifies three primary causes, namely that African governments are slow to put in place the infrastructure that is essential to allow e-procurement, the insufficient infrastructure for information technology (IT) and the absence of widespread internet access (Anthony, 2018). Africa has provided mixed results in terms of the adoption of e-procurement (Muthoka, 2016; Mothibi, 2020; Pitso, 2018; Adebayo & Evans, 2015). Researchers contend that in order to overcome the latter circumstance and reap the anticipated benefits of e-procurement, public procurement policy initiatives need to be evaluated and established as a cohesive plan for all stakeholders (Muthoka, 2016; Pitso, 2018; Mothibi, 2020). In Nigeria, Ibem, Aduwo, Afolabi, Oluwunmi, Tunji-Olayeni, Ayo-Vaughan, and Uwakonye (2021) state that investment in ICT infrastructure and skills acquisition should be taken into account. This study also revealed that private stakeholders were the ones that used e-procurement tools more than public organisations.

In South Africa (SA), the National Treasury and corporations are working to improve efficiency and enable smarter decisions by optimising resources, redesigning processes, and developing creative tools (Anthony, 2018). The SA National Treasury has acknowledged the capabilities of digital procurement to automate supply chain to optimise performance since 2015. The Central Supplier Database (CSD) was established on behalf of all public sector for potential vendors seeking to conduct business with the government. At the provincial level, the Western Cape Treasury is one of the government divisions that has adopted the e-procurement system. Both the public and municipal finance laws in the province of Mpumalanga are kept under the jurisdiction of the Mpumalanga provincial treasury. However, little is known about whether the Mpumalanga Provincial Treasury has implemented an e-procurement system and this study filled that knowledge gap.

1.3. Research Problem

The above discussions show that organisations and public entities that have adopted e-procurement have enjoyed its benefits, including improved operations, internal support, influence buyers, lower costs, and enhanced collaboration relationships (Anthony 2018, Mgidlana, 2013). Despite the said benefits emerging from the successful adoption and the full implementation of e-procurement, developing countries struggle to accelerate the process of embracing e-procurement (Kabanda, Pitso & Kapepo, 2019). Rukuni, Maziriri and Mulaudzi (2020) assessed e-procurement among state-owned enterprises in South Africa. The study found that employees harboured negative perceptions of factors that affected the implementation of e-procurement. According to the latter research, the lack of comparability, resources, organisational culture challenges, infrastructure problems, and environmental problems were the reasons employees had poor impressions. Although the scope of these findings is limited to state-owned enterprises, however, it is in line with the observation made by the World Bank on the obstacles to the adoption and implementation in Africa. Many factors have an impact on the performance of e-procurement systems, and their adoption and deployment have not been without challenges. Furthermore, the key success factors that influence the adoption of the e-Procurement process in public institutions have been the focus of several studies in the past (Adebayo & Evans, 2015; Ronald & Omwenga, 2015; Innocent & Kalaskar, 2016).

The South African National Treasury has set the tone for the adoption of e-procurement systems, and since then it has been expected that other government entities would also follow suit (Anthony, 2018). To date, the Western Cape is among the government entities that have adopted an e-procurement system. Few studies (Myataza, 2015; Rukuni, Maziriri & Mulaudzi, 2020; Kiwekete & Doorgapersad, 2017) have reported on public sector procurement in Johannesburg, and none of these studies reported on the procurement system of the Mpumalanga treasury. The study by Myataza (2015) evaluated the state of e-procurement of the Eastern Cape provincial government. According to the decision of the report, the Eastern Cape provincial government to deploy e-procurement was adversely affected by insufficient information technology infrastructure and high supply chain management vacancy rates. This research attests that the adoption and execution of electronic procurement in government are

affected by various factors and these factors could be contextual, thus requiring tailored solutions.

The aim of this study was to investigate the perceived factors influencing the adoption of e-procurement and further establish employees' perceptions of e-procurement in the Mpumalanga Provincial Treasury. This research needs to uncover information on the adoption and implementation of e-procurement in the Mpumalanga Provincial Treasury so that decision makers would receive thoroughly researched recommendations. Tutu, Kissi, Osei-Tutu and Desmond (2019) agree and further state that e-procurement has benefited various countries, including Ghana, severally in terms of effectiveness, business strategy, streamlined procurement, decreased mismanagement, increased compliance and procurement standardisation. Seeing that there are many benefits to embrace and implement e-procurement, thus it is pertinent to ask if the Mpumalanga Provincial Treasury has adopted this system.

1.4. Research Questions

- What factors are affecting the adoption of the e-procurement system in the Mpumalanga Provincial Treasury?
- What are the perceptions of Mpumalanga Provincial Treasury's employees on the adoption of the e-procurement system?
- What are the barriers and benefits on the adoption e-procurement in an organisation?

1.5. Research Objectives

- To identify the factors affecting the adoption of the e-procurement system in the Mpumalanga Provincial Treasury.
- To determine the perceptions of Mpumalanga Provincial Treasury's employees on the adoption of the e-procurement system.
- To determine the barriers and benefits on the adoption of e-procurement in an organisation.

1.6. Preliminary literature review of the study

1.6.1. Supply chain management and e-procurement

Supply chain management is a flow of integrated information that follows the strategic management process in which an organisation adopts the planning, implementation, and control of supply chain operations; the main goal is to make a business more effective and efficient (Chopra & Meindl, 2016). Hugos (2018) states that the planning process requires

integrating facility location with other essential supply chain functions, such as procurement, production, inventory, distribution, and routing. Procurement is one of the most important aspects of supply chain management because it helps streamline the supply chain network (Mgidlana 2014; Adebayo & Evans, 2015). Scholars, Innocent and Kalaskar, (2016), Ibem, Aduwo, Afolabi, Oluwunmi, Tunji-Olayeni, Ayo-Vaughan and Uwakonye, (2021), state that E-Commerce apps are being used more often as a result of the development of internet technology. Ibem and Larye (2015) noted that e-procurement systems in particular, are used by businesses from many industrial sectors to manage their supply chains. E-procurement is a modern system adopted by many organisations for the procurement of goods, works, and services (Mose, Njihia, & Magutu, 2013). Amin, 2012; Bausa, Kourtidis, Liljemo, Loozen, Rodrigues Frade and Snaprud (2013) state that it is an Internet-based application that allows the users the platform to process services such as requisitions, requests for quotation, view catalogues, placement of orders, e-tendering, raising purchase orders, and many more. Due to better information transmission and user access, the adoption of e-procurement has a considerable influence on the structure and functions of supply chains.

1.6.2. Barriers affecting adoption e-procurement

In the world of business and technological innovation, information and communication (ICT) is growing and continues to alter the operational processes of organisations. The Internet has increased in popularity, people and businesses have become progressively connected in order to keep up with changes, times, and technology. The adoption of e-procurement is relatively a new theme of development in many business applications. Oteki (2019) notes that e-Procurement has been developed as a technique to obtain better, more affordable procurement solutions to address various administrative issues. However, the literature (Laryea, Ibem, Pigawa & Phoi, 2014, Nawi, Roslan, Salleh, Zulhumadi & Harun, 2016, Rukuni, Maziriri, & Mulaudzi, 2020) shows that the implementation and adoption of e-procurement are prone to potential challenges as a result of an organisation's culture, high-cost installation of software security systems. Other complexities include reliable ICT infrastructure, lack of available skills, management support, and resistance to change, lack of proper training compatibility, and continuous system failures mainly due to issues of electricity supply in South Africa or network disruptions.

1.6.3. Benefits of adopting e-procurement

Electronic procurement benefits have broadly been acknowledged and observed in both government and private sectors (Adebayo & Evans 2015). The benefits of implementing e-Procurement comprise transparency, operational effectiveness, cost benefits, a paperless environment, and the emergence of new suppliers. Although Ibem and Laryea (2015) noted that the adoption of e-procurement increase production flexibility, improve customer engagement, and improve real-time information on procurement. Ibem, Aduwo, Afolabi, Oluwunmi, Tunji-Olayeni, Ayo-Vaughan, and Uwakonye (2021) state that the adoption of e-procurement has proven to be sufficient, reliable, and easy to use. King'ori (2013) emphasises that electronic procurement enables the organisation to have better control of finances, improved accounting and set up checkpoints where the flow of orders across the system is traceable.

1.6.4. Factors influencing e-procurement

Compared to a decade ago, procurement practises have changed greatly. Businesses face a dynamic in process of transformation in today's technological trends, building a business that can adapt to digital changes is an advantage for competition in the current market environment. Mose, Njihia, and Magutu (2013) state that the availability of internet usage has marked a major shift in the operations and the way organisations conduct procurement activities. Laryea, Ibem, Pigawa and Phoi (2014) noted that e-procurement is a key tool that organisations can use to encourage various factors, such as value for money and efficiency in job delivery. Other scholars add that e-procurement could also eliminate geographic barriers to participation in procurement activities, better procurement transparency, accountability, and better management (Muchiri, 2015; Ronald & Omwenga, 2015). Furthermore, Afolabi, Ibem, Aduwo, Tunji-Olayeni and Oluwunmi, (2019) state that e-procurement supports the execution of traditional business process activities to improve the level of productivity and competitiveness.

1.6.5. Organisational performance with e-procurement

Organisational performance is the change that occurs as a result of the implementation and administration of a programme by an organisation's management and governing body to assess its current level of performance (Oppong, 2020). The aim is to improve the effectiveness and

efficiency of the organisation's ability to offer goods and services. E-procurement changed the methods and coordination of procurement processes, provides an automated electronic data interchange (EDI) between suppliers and customer purchasing operations (Kituzi, 2016). Web-based procurement simplifies the business-to-business purchasing process and provides the information needed to make better buying decisions. Supply chain now places a significant focus on technological innovation because Web-based technology has improved and enhanced all commercial channels and operations in the current globalised and competitive environment (Avedi, 2016). Adoption of e-procurement inside a company is essential, as it demonstrates management's dedication to changing the way the supply chain functions. Gardenal (2013) states that e-procurement may have advantageous effects, such impacts include improved capability, better purchase behaviours, less paperwork, less time consumption, and improved productivity.

1.7. Theory underpinning the study

The theoretical paradigm for e-procurement adoption put forth by Gunaserekan and Ngai (2008) was utilised in this research. The theory was applied in a Hong Kong empirical investigation and in other sectors as it will be shown in chapter 2 under theoretical framework. The focus of this theory is presented in Figure 1.1.

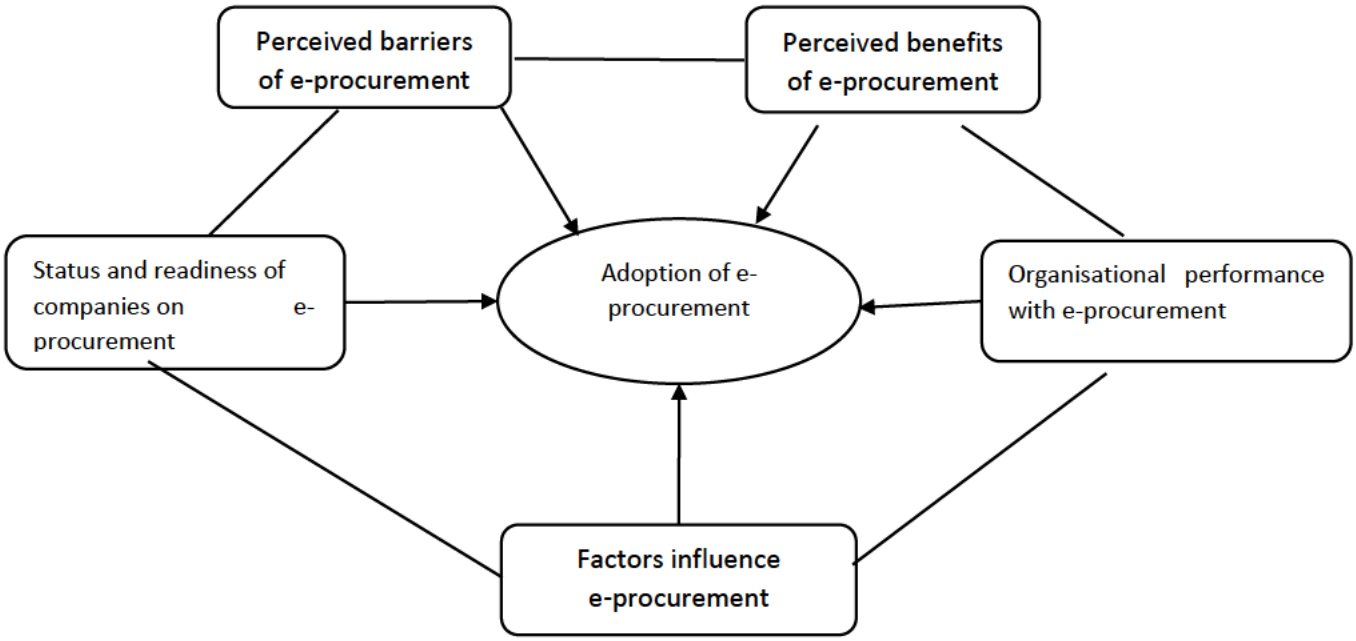


Figure 1. 1: Gunasekaran and Ngai Model: A Theoretical Framework on the successful implementation of e-procurement ***(Source: Gunasekaran, McGaughey, Ngai, and Rai 2009)***

The theoretical framework incorporates four key components that are associated with the adoption of e-Procurement, including perceived benefits, barriers, and organisational performance. This theory was further expanded by Gunasekaran, McGaughey, Ngai, and Rai (2009:163), as they included the new item called "status and e-procurement readiness of organisations. All components were used to analyse and explore the influence of the adoption of e-Procurement.

1.8. Significance of the study

The aim of this study was to investigate the perceived factors influencing the adoption of e-commerce and further establish employees' perceptions of e-procurement in the Mpumalanga Provincial Treasury. The researcher hopes that this study offers useful information on the function and impact of e-procurement and the adoption of digital systems, particularly in public procurement entities. Although attention is paid to perceived factors that influence the adoption of e-procurement, the study contributed to understanding the adoption of e-procurement in another provincial department in Mpumalanga and beyond. Furthermore, a study titled 'Perceived factors affecting the adoption of electronic procurement in the Mpumalanga Provincial Treasury' was extracted from the study and presented at the South African Association of Public Administration conference held on 24-29 September 2023.

1.9. Rationale of the study

E-procurement contributes to the efficiency, effectiveness, cutting of cost, and transparency of the organisation. In addition, customer service is connected to effectiveness, efficiency, and innovation. This study was carried out to investigate and understand the driving forces behind the deployment of an e-procurement system. Although the adoption of e-procurement has the potential to make the procurement process simpler and more economical, organisations' unwillingness to accept modern technology makes the procedure's value overlooked, as organisations continue to rely on traditional means to obtain the essential goods Mahdillou & Akbary (2014). Failure to conduct this study and adoption of e-procurement in a government department that includes the Mpumalanga Provincial Treasury will remain unchecked.

1.10. Research Methodology

1.10.1. Research design

Babbie (2020) and Kumar (2019) state that research design offers a researcher a plan to decide what the researcher wishes to study, where the study will be carried out, and why the research is done, in addition to what type of data is required, what techniques of data collection will be used. This study adopted the explanatory descriptive study technique. McCombes (2019) describes descriptive research as a type of study that focusses on identifying the characteristics of the population or topic under investigation.

1.10.2. Research Approach

The study adopted the use of a quantitative research approach for data collection. The approach was chosen because it uses a logical approach to establish the link between theory and study (Bryman, 2016). In addition, the research aimed to apply its results to the relevant population. The study used numbers to understand the phenomena being studied (Bryman, 2016). Tables and graphs were used to analyse the data in quantitative data collection.

1.10.3. Study site

The study site for this research project is the Mpumalanga Provincial Treasury. The department is located in the Government complex of Mpumalanga, Nokuthula Simelane Building, 7 Government Boulevard, Riverside Park Extension 2, City of Mbombela.

1.10.4. Target Population

Babbie (2020) states that when conducting research, the opportunity to investigate the entire population of interest is practically never possible; however, the researcher can always choose a sample from among the data that can be collected and evaluated. Respondents to this study were purposefully selected from only personnel in supply chain, ICT and finance in the Mpumalanga Provincial Treasury. Because the target population has sufficient understanding of the study content. The Treasury division has various departments, which employ about 317 staff members. The study focused on the employees described above. According to the information shared by the Chief Financial Officer, the sought division has a staff complement of 35.

1.10.5. Sample

The sample is a smaller group of data from a larger population selected for data collection (Leedy & Ormrod, 2019). Probability sampling methodologies with simple random sampling to choose the size of the sample from the organisation's employees; all responders have a free and equal chance to participate in this approach because it is not selective (Leedy & Ormrod 2019). The sample consists of three elements that include participants from finance, ICT, and supply chain management divisions at the Mpumalanga Provincial Treasury. According to Krejcie and Morgan (1970), states that when the total number of the population is 35 the sample size is 32.

1.10.6. Sampling strategies

The study adopted the probability sampling methodologies where simple random sampling was adopted in the selection of respondents from the population. Because simple random sampling has the ability to produce generalisable results (Leedy & Ormrod 2015). Leedy & Ormrod (2019) further define probability sampling as a sample drawn randomly from the entire population, having the selection process carried out in a way that gives every member of the population an equal opportunity of being chosen. A sample frame included all 35 staff members in the ICT, Supply Chain Management, and Finance sections at the Mpumalanga Provincial Treasury.

1.10.7. Sample size

The sample size is determined and drawn from the sample-targeted population. The level of accuracy is said to be the main determinant (Bryman 2016; Kumar 2014). This study used the Raosoft (2017) sample size calculator to determine the sample size, focussing on confidence intervals of 5% with a confidence level of 95 percent. The sampling size of the study therefore focused on a small number of staff mainly in ICT, finance, and supply chain divisions. About 35 staff from the selected departments play an important role in the procurement activities of the Mpumalanga Provincial Treasury. Due to a small number of populations targeted, the study utilised the simple random sampling method.

1.11. Data collection methods

Following the identification of the study topic and the research design, the data collection begins, Kumar (2014). The study will employ primary data collections, such as questionnaire

surveys and checklists, and secondary data through desktop document analyses from journals, unpublished thesis, and web-based published articles related to the study. In respect of the research objectives identified this study used a carefully constructed, self-administered questionnaire. A Likert scale with five points in the measuring instrument was adopted for the study. The participants received the printed questionnaires and were also given time to respond. Feedback from the participants were analysed after the participants completed the questionnaires.

1.11.1. Data Quality Control

Quality control refers to the procedures and steps that researchers take to ensure the precision and validity of the data being collected using the approach they have chosen for their study (Sage,2022). Reliability is the quality of a measure's consistency or dependability with respect to a construct (Bhattacherjee 2012). Validity refers to a concept, measurement, or research design that accurately represents the subject under evaluation or examination (American Educational Research Association, 2018). By providing operational definitions of the variables and keywords, the current study addressed the validity of the construction. Furthermore, the validity of the study also addressed the content by constructing thorough research questions, defining all relevant terms used in the study, and choosing suitable respondents with sufficient understanding to answer questions.

1.12. Data analysis

Data analysis comprises consolidating data such that the findings may be interpreted by McCarthy and Golicic (2005). This study adopted the quantitative data approach through structured questionnaires. Descriptive statistics such as percentages and averages were used to analyse the primary data. Tables, charts, and bar graphs were used to present the interpreted data in this study. The study used the statistical package for the social sciences (SPSS) to analyse the data gathered.

1.13. Ethical Consideration

In the scientific world, research studies require the researcher to be ethically considerate and accountable. Leedy and Ormrod (2019) identified four categories of ethical consideration, which are protected from harm, voluntary and informed participation, the right to privacy, and the participation of the researcher. At every level of a study project, ethical concerns must be followed. Welman, Kruger, and Mitchell (2010) add that every research project must adhere to the ethical principles: confidentiality, informed consent, researcher collaboration, and

protection from harm. The researcher adhered to the relevant ethical code of conduct. Furthermore, the study used caution, responsibility, and sensitivity to be considerate of and respectful of research participants and their basic rights. Participants were fully informed about the purpose and procedures of the study. No participant was pressured to participate in the study, and all participants were free to leave at any time. Participants were assured of their privacy, data confidentiality, and anonymity when it comes to data collection during the study. Data analysis and reporting followed the ethical level of research. All the approaches presented, as well as the individuals and sources used, were acknowledged. Furthermore, ethical approval for this study was obtained from the University Ethics Committee.

1.14. Limitations and Delimitation of the study

The research was limited to the Mpumalanga Provincial Treasury department based at the Mpumalanga government complex in Mbombela. Delimitation of the study focused on the department of ICT, Supply Chain Management, and Finance which has 35 staff members. The questionnaire was structured, printed, and handed to the participants. The content included factors influencing the adoption of e-procurement, the views of employees towards the adoption of e-procurement, and the benefits and barriers of e-procurement.

1.15. Chapter summary

This chapter has provided a comprehensive foundation for the research study, setting the stage for an in-depth exploration of the factors influencing the adoption of e-procurement in the Mpumalanga Provincial Treasury. The researcher began with an introduction to the study, highlighting the increasing importance of e-procurement in the modern public procurement landscape. The background of the study illuminated the context within which the research is carried out, emphasising the significance of the Mpumalanga Provincial Treasury as a case study. The research problem was identified, emphasising the pressing need to understand and address the barriers and facilitators that impact the adoption within this specific organisational context. The purpose of the study was made clear, to investigate the perceived factors that influence e-procurement adoption, which ultimately stands to improve efficiency, transparency, and accountability in public procurement.

In addition, the chapter embarked on a preliminary review of the literature that laid the groundwork for our research. This review revealed existing knowledge gaps and underscored the relevance and timeliness of the study in contributing to the field of e-procurement and public procurement practices. The significance of the study was emphasised by underlining its

potential to inform decision makers, public officials, and researchers in similar contexts, ultimately fostering more efficient and accountable procurement practises. The rationale of the study was explored, identifying the need for a comprehensive examination of employee perceptions in the adoption process, as these stakeholders play a critical role in the success of e-procurement initiatives. The chapter was rounded off with a synopsis of the research methodology, providing an overview of the approach that will be employed to address the research problem and achieve the study's objectives. With this solid foundation in place, the research was well prepared to delve into the empirical investigation and analysis that formed the core of this research, shedding light on the factors influencing the adoption in the Mpumalanga Provincial Treasury and contributing valuable insights to the broader field of public procurement.

CHAPTER TWO

LITERATURE REVIEW ELECTRONIC-PROCUREMENT IN PUBLIC SECTOR

2.1 Introduction

The review of existing literature in this chapter looks into the significance of the impact of adopting electronic procurement for an organisation. The analysis is based on publications and unpublished dissertations that address opinions related to the execution of various e-procurement projects throughout the world, African countries, including South Africa. With a comprehensive overview of earlier studies on the adoption of e-procurement, this review of the literature seeks to add to the body of information already in existence. This review sets the basis for a more thorough understanding of the effects it has had on the firms that have adopted it. This chapter will become with defining key terms in the study which is followed by an overview of procurement in the South African public sector. The chapter will further discuss e-procurement and how it brings about change in the procurement processes in organisations. In addition, the factors that influence the adoption of e-procurement are discussed as well as the theoretical framework of the study.

2.2. Definition of key concepts

2.2.1. Supply chain management

The definition and description of supply chain management vary among academics and authors. For example, Mgidlana (2014) defined supply chain management (SCM) as the process and practise of building and enhancing cooperative relationships among the parties to a supply chain and its distribution networks. Although Du Toit and Vlok (2014) describe SCM as the driving force behind business attempts to increase organisational productivity and profitability. Furthermore, supply chain management is an umbrella term that simplifies a set of practises to ensure the management of information flow, cost effectiveness, and customer service through collaboration (Tshilo & Joyce, 2020). Chopra and Meindl (2016) add that supply chain management is a flow of integrated information that follows the strategic management process in which an organisation adopts the planning, implementation, and control of supply chain operations. The main goal is to make business more effective and efficient. Hugo (2018) highlighted that the planning process requires integrating the location of the facility with other essential supply chain functions, including procurement, production, inventory, distribution, and routing. Furthermore, the management of the supply chain includes all operational processes required to deliver the right product to the right client at the right time

and in the correct quantity (Mahdillou & Akbary, 2014). Serdarasan (2013) states that SCM has emerged as one of the key strategic elements in dealing with the growing complexity of the present corporate environment. As a result, a variety of factors, such as globalisation, improved information access, evolving market circumstances, and regional collaboration, have increased the relevance of SCM (Mpehle & Mudogwa 2020). These, in some ways, adhere to the same basic idea of planning, sourcing, manufacturing, and delivery.

Furthermore, Madzimure (2016) states that efficient and effective supply chain management can give a company a long-lasting competitive edge that will strengthen its position in the market. Every supply chain has the goal of maximising the value created overall, which is crucial. Chopra and Meindl (2016) state that a supply chain adds value by taking a number of steps to offer the client valuable goods and services and by striving to satisfy the client's request. Furthermore, the main objective of supply chain management is to provide the best possible customer service by coordinating the management of finances, resources, and information that flows through a system of networking (Chopra & Meindl, 2016). Therefore, it is a collective of building blocks that a company takes to transform raw materials into a final product. Mbanje and Lunga (2015) pointing out that SCM strives for an integrated approach that utilises elements from all aspects of management of operations, logistics, and purchasing. Organisations follow a simple supply chain management process as in Figure 2.1.

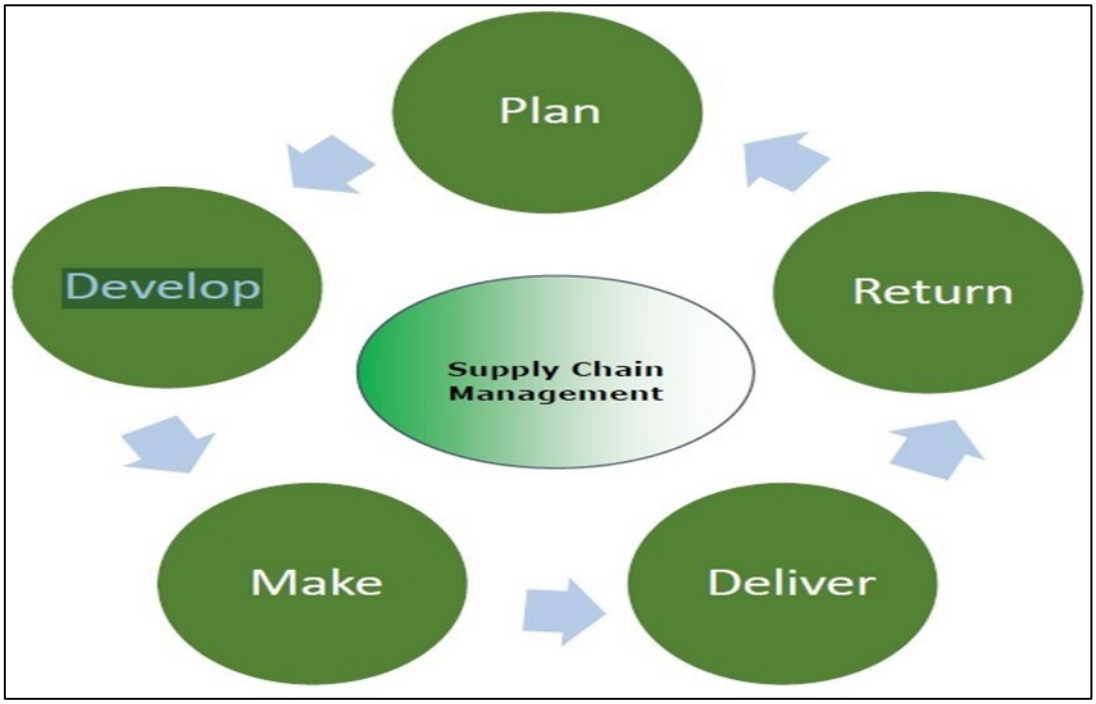


*Figure 2. 1: Supply chain management processes (**Source: India Mart, 2018)***

2.2.2. Procurement

Procurement is a channel of activities coordinated by a network of different partners and activities in the supply chain to obtain goods or services (Dhull & Narwal, 2016). Masudin, Aprilia, Nugraha, and Restuputri (2021) state that due to the need for businesses to request services or make purchases of items, procurement is most often associated with enterprises. Additionally, procurement is among the most essential supply chain procedures; the most significant goal is finding the greatest products at reasonable prices (Young, James & Munichiello, 2023). Additionally, procurement typically refers to the final procedure in the purchase process. However, this also includes the complete purchase management process of identification of a need, sourcing, selection, negotiation, ordering, receiving, and payments to meet the requirements and achieve business objectives (Nawi, Roslan, Salleh, Zulhumadi, & Harun, 2016). Furthermore, procurement management is in charge of supervising each step in the process of procuring the goods, materials, and services required, to ensure that corporate operations are carried out effectively (Schoenherr, 2023). The capacity of procurement management is to locate and regulate relationships with suppliers outside of the organisation to ensure that the required items are purchased at the most affordable price.

In addition, procurement is classified into various types including direct procurement, indirect procurement, and service procurement. Monczka, Handfield, Giunipero, and Patterson (2015) state that direct procurement refers to the purchase of supplies such as equipment, wholesale items, and raw materials that are directly used in the firm’s production operations. Njualem and Smith (2018) in addition to being essential to the creation of the finished product, direct procurement has a big influence on business performance, profitability, and efficiency of the business. Indirect procurement supports the day-to-day management of the business. This strategy entails investing in goods that do not immediately contribute to the creation of the company's final product. However, it is necessary to acquire supplies for daily operations, such as office supplies, furniture, equipment maintenance, marketing, or consulting services (Israel & Curkovic 2020). Although service procurement is the process of obtaining services from outside suppliers to meet the specific services required by the organisation. Wynstra, Rooks, and Snijders (2018). Noting that this can include the use of outside consultants, expert service providers, or maintenance service companies.

Moreover, organisation procurement is characterised by structures, these structures according to Baily, Farmer, Crocker, Jessop, and Jones (2015) noted that the majority of big organisations have an understanding of how the procedures for acquiring products, works, and services are structured. The structures include centralised control, decentralisation, and centre-led (mixed). More control and potential for streamlining procurement procedures are provided by centralising the purchasing process (Vogler, Habimana, & Haasis, 2022). Furthermore, decentralised procurement is a procedure in which a company's decision-making authority and responsibility are divided across several departments or locations (Baily *et al.*,2015). This enables every department to handle its own purchases. Even more important procurement structure Centre-Led procurement incorporates elements of both centralised and decentralised arrangements. The Centre-Led procurement offers a means of keeping the home office in charge while enabling the other sections to operate on their own (Fang & Natarajan, 2020). The central office issues guidelines for best-practises, cost, compliance, and performance indicators.

2.3. Evolution of procurement

This section outlines the development of procurement**.** Procurement practises have existed for thousands of years dating back to 3000 BC (Varadharajan, 2020). The need to acquire goods and services through formal transaction processes has been utilised throughout history. Historical evidence of procurement development is found in ancient times when scribes were used to administer, track, and manage the supply of materials used to carry out the construction (Schaafsma & Schrakamp, 1985). Moreover, William the Conquerer was the first to use procurement in Great Britain, who desired a simple mechanism to record tax revenues. Furthermore, the relevance of procurement began to grow in the 1800s during the industrial revolution, as Usifoh (2018) states that the ‘Material Men’ and ‘supplying departments’ were used to handle the acquisitions and transportation of goods and services.

In the late 1990s, organisations began to recognise procurement as a management function. Knowledge in key areas of strategic supply chain management prepared professionals with the ability to compete with suppliers (Monczka, Handfield, Giunipero & Patterson, 2015). Procurement has become a critical function within organisations. As companies are realising the importance of evaluating supply factors such as pricing, quality, durability, and availability (Khan Hussain, Khan, & Fatima,2018). According to Iquantum (2022), the competition of the supplier gave organisations the influence to integrate the procurement into the strategic

planning processes. Monczka *et al.* (2015) state that organisations used manual processes necessary to complete procurement tasks. The procurement task includes sourcing materials, goods, and services, identifying suppliers requesting delivery, invoicing, and payments, as well as developing long- and short-term supplier relationships. This technique of procuring products and services is referred to as "traditional procurement" since it has been in use for a long time and has been the sole option available for doing so (Mathonsi & Thwala, 2012).

The responsibilities in traditional procurement were commonly assigned to a procurement team with each team member concentrating on carrying out a certain responsibility (Watt, 2014). According to the Procurement Software Blogs (2019), the administration of procurement processes involved paper documents, excel spreadsheets, phone conversations, and in-person meetings. In other words, every member of the team was expected to submit paperwork, publish catalogues, and work with the finance team to make sure that supplier payments are made on time. For decades, manual procedures have been considered a reliable technique in all businesses. Furthermore, Abdullah (2022) emphasise that obtaining the correct products at the right price appears to be the department's main objective, making procurement appear to be quite steady. The author further states that organisations established the procurement department to help businesses increase the stability of their supply.

Strategic procurement has changed over time. Enabling businesses to employ technology effectively and efficiently to handle the issues caused by a more dynamic and competitive market (Usifoh, 2018). Modern procurement departments are cross-functional and engage in a much wider range of tasks. Rudiger (2015) states that tasks include choosing suppliers, managing supplier relationships, creating corporate supply, and organisation's bottom-line strategies. With the creation of the Internet, procurement took on a more dynamic role and has transformed how organisations conduct business (Mothibi, 2020). Modernising procurement processes has been seen as a key turning point in the development of procurement, with creating a more efficient and effective approach to the organisations (Nawi, Roslan, Salleh, Zulhumadi, & Harun, 2016). The speed of action has become faster because organisations engage in business-to-business e-Commerce, with software advancements that have continued to make the process of procurement increasingly comprehensive and precise (Watt, 2014).

E-procurement sought to be a more comprehensive and innovative way in modern procurement processes. Millman (1998) cited by Mothibi (2020:51) noted that the use of e-procurement was

initially embraced by organisations that were utilising electronic data interchange technologies in the 1960s. Chan and Owusu (2022) state that different technology developments have caused the move from conventional procurement to electronic procurement, as e-procurement has gained popularity over the past few years. Ageshin, (2001:49), White (2000:6); Chircu and Kauffman (2000) and Carabello (2001:82) state that EDI was mainly used to control large flows of resources or information, the earlier adopters of e-procurement were in health care sector, retail, travel, and automotive industry. Chirchir, Ngeno, and Chepkwony (2015) state that the Internet and information technology application contributed to the acceleration of e-procurement development. According to the United Nations (UN) report (2006:148), over the years, electronic procurement systems have steadily replaced traditional paper-based procurement procedures, which have changed the industry. E-procurement has significantly shaped traditional procurement processes. Given the advancement and application of more sophisticated technologies to manage and carry out procurement operations (Chan & Owusu, 2022). In general, using digital technologies such as artificial intelligence (AI) to automate procurement procedures and improve supplier collaboration is the most recent development in the field of procurement. (Accenture, 2021).

Procurement developed in stages from the ancient times to the traditional procurement systems when paper-based purchasing method was the only choice for procurement. Enterprise resource planning (ERP), systems, software, and products in data processing (SAP), as well as electronic data exchange (EDI), are examples of digital solutions that were used by the procurement industry to supplement traditional procurement (Shafiee, Karim & Moghaddam, 2018; Kumar & Suresh, 2017). Moreover, the advent of technology has evolved and transformed procurement processes overtime when the adoption of electronic procurement systems modified traditional procurement. The stages are presented in Figure 2.1 below

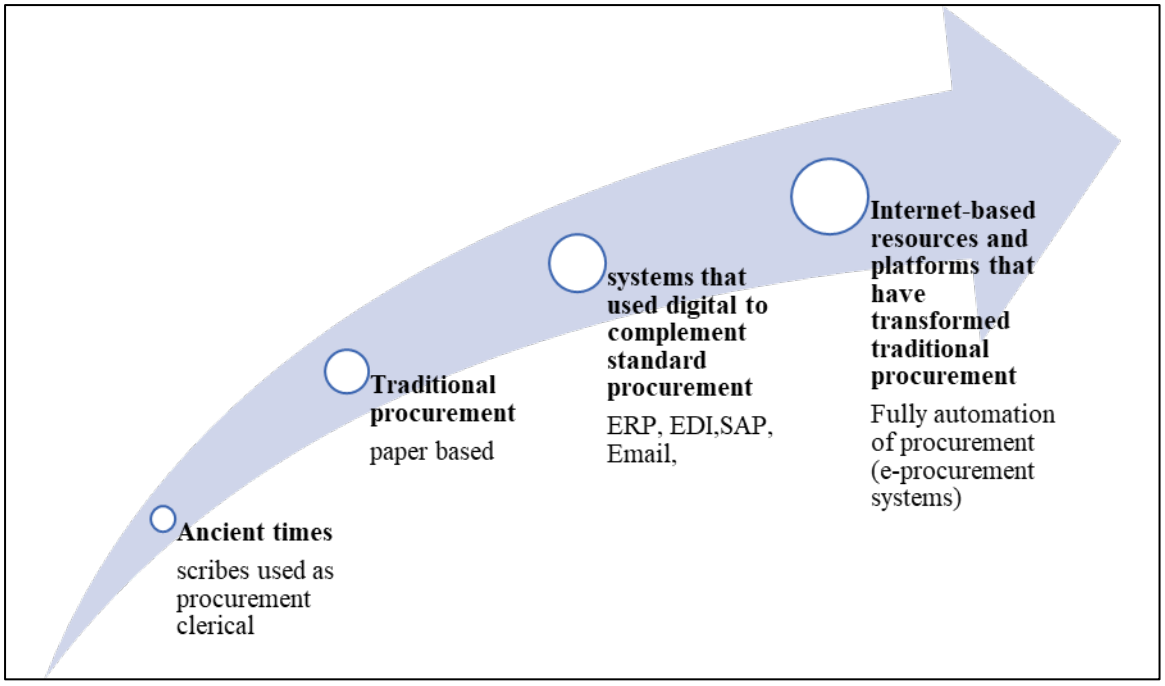


Figure 2. 2: Historical development of procurement the past and the present ***(Source: Author's compilation)***

2.3.1. E-procurement in an organisation

In today's rapidly evolving business landscape, the efficient and cost-effective management of procurement processes is paramount to the success and competitiveness of any organisation. The advent of technology has ushered in a new era of procurement, characterised by the seamless integration of digital tools and systems. This transformative approach to procurement is commonly referred to as "e-procurement." E-procurement represents a paradigm shift in the way organisations source, purchase, and manage their goods and services. It uses the power of the internet and digital platforms to streamline and automate various procurement activities, providing numerous benefits, including improved efficiency, reduced costs, increased transparency, and greater accountability (Chirchir, Ngeno & Chapkwony, 2015). In this age of digital transformation, understanding and implementing E-procurement within an organization is not just a strategic choice; it has become a necessity for achieving operational excellence and maintaining a competitive edge.

Various authors have defined e-procurement in different ways, for example Tatsis, Mena,Van Wassenhove and Whicker (2006) describe e-procurement as an electronic tool and technology as well as web-based applications to integrate, manage, automate, optimise, and empower an organisation's procurement process. Hugo and Badenhorst-Weiss (2011) define e-procurement

as an on-line procurement, which utilises a web-based method for acquiring products and services electronically. Hatice and Mehmet (2012) and Uddin (2015) further define e-procurement as a strategy of using information technology to streamline business-to-business (B2B) exchanges for the acquisition of goods and services. In general, each concept is focused on the ideology of using the digital transactional aspects of procurement activities to automate traditional paper-based processes. Furthermore, e-procurement is the current practise of making purchases online using electronic means necessary to revolutionise and streamlining procurement functions including e-procurement systems (EPS) (Western Cape Government) and central database systems (CDS) software (Ilhan & Rahim 2013; Mpehle & Mudogwa 2020).

E-procurement systems refer to the computerised tool designed to manage the procurement procedure (Francois, 2022). Suleiman (2013) and Chaffey and Ellis-Chadwick (2019) state that EPS is typically a direct software that allows suppliers and purchasers electronic access to conduct business. It allows organisations to streamline the individual or all stages of procurement processes, from initial identification of a need to the payment and potentially the contract administration. The use of electronic procurement has proven to provide several advantages in organisations that have adopted the system (Oteki, 2019). In the 1960s, automated purchasing transactions have been provided between customers and their suppliers through electronic procurement systems such as the electronic data interchange (EDI) (Chopra & Meindl 2013).

EDI systems help businesses automate data transfer between apps throughout the supply chain. In other words, the process distributes data that is essential for business operations. The authors further state that the other electronic system that was launched in the 1970s is the ERP, this system allows the organisation to use a single source through analysis of the company's automation of procurement activities, reducing paperwork (Chopra & Meindl, 2013). Then, in the 1980s, the World Wide Web (www) was used for business purposes, making the internet's multimedia capabilities broadly accessible and providing the crucial resource for the automation of procurement (Chopra & Meindl, 2013). In addition, the Internet has emerged as the primary means of communication on the global Web, connecting suppliers to clients along the supply chain.

These types of e-procurement system are quite common in large organisations and government sectors where procurement procedures are in place to manage spending activities (Madzimure, 2018). The potential benefit of e-procurement systems has been acknowledged by organisations that experiment with them (Muntangili, 2014). Chen, Bretschneider, Stritch, Darnall, and Hsueh (2021) state that the adoption of e-procurement systems has proven to provide efficiencies that minimise the amount of time staff spends sourcing, ordering items and tied up delivery and invoicing. The system potentially has the ability to reduce costs and free up personnel for other tasks. Bulut and Yen (2013) argue that saving costs result from fewer employees processing each purchase and orders faster, due to automated validation of preapproved expenditure budgets for individuals and departments.

2.4 The characteristics of procurement in South African public sector

Procurement in government administrations provides the delivery of goods, services, and works. For example, the construction of roads, ports, and services for residents living in communities and metropolitan areas of a country, including health care and education (Mothibi, 2020). Hugo and Badenhorst-Weiss (2013) further state that the structured method of procurement in an organisation ensures that it obtains the most possible value. Through the selection and negotiation of qualified and capable suppliers, contracting, research into the supply market, and encouragement of the development of supplier measurement and systems. Organisations spend a great number of resources on acquiring supplies, services, and capital assets. Anthony (2018) and Ambe (2016), also support this view, stating worldwide, organisations, particularly governments, spend about 5% to 10% of gross domestic product (GDP) on the procurement of goods, works, and services annually. The authors go on to say that this level of public spending on procurement has given governments the opportunity to put some national principles into practise.

The Republic of South Africa's 1996 Constitution, Section 217, regulates public procurement in the context of the country's procurement system. The section indicates that procurement clause provide the five guidelines (value for money, competitiveness that is transparent and efficient, morality and integrity, accountability and public reporting and equity) to all the spheres of government and all institutions aligned with the government. This is to ensure that procurement goals are met. Therefore, it is necessary for all institutions within the public sector to include these guidelines in their procurement procedures. Van Rooyen (2015) states that the main objective of the guidelines is to maximise the growth and development of the country.

Government entities, including municipalities, are required to follow the guidelines with organisations particularly those who wish to do business with government (National Treasury, 2005). In addition, according to the Preferential Procurement Policy Framework Act (2000), suppliers and contractors are also guided by the constitution to promote Broad-Based Black Economic Empowerment (B-BBEE). By doing this, the effectiveness and economy of public procurement procedures would be ensured.

South Africa is no exception to the rule that each nation has its own procurement preferences. This suggests that the country's public procurement system has an essential contribution. Incorporated by regulations, supply chain management in South Africa is regulated within the framework set by the national Treasury (RSA, 2003) stating the promotion of good governance principles, extended by provincial and municipal government entities to certain laws, policies, and regulations. The national Treasury also offers the legal framework for supply chain management guidelines, best practises, and legislation that govern the execution of supply chain management at all levels of government departments and other publicly funded companies affiliated with the government.

The key legislation influencing this function mentioned guidelines are included in the Constitution of Republic of South Africa 1996. Including the Public Finance Management Act (PFMA), 1999 (Act No. 1 of 1999), the Supply Chain Management, 1999, the National Treasury Regulations (2005), the Preferential Procurement Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000), and the Black Economic Empowerment (BEE) codes of good practise, made available by the Department of Trade and Industry (DTI) in 2007.

Munzhedzi (2016) states that using a preferred procurement system as a guide, the government implemented a reform in public sector procurement. Where, provincial and local governments, as well as national ministries, are allowed to develop and create their own specific policies, procedures, and structures within the parameters of the national regulatory framework (National Treasury, 2005). Moreover, the five pillars of procurement, which form the basis of the entire SCM policy of municipal and government procurement, are five key principles of behaviour that are included in all legislative actions, including the aforementioned legal framework. They include the following.

2.4.1. South African procurement pillars in the government sector

- **Value for Money**: refers to the procurement system's cost effectiveness by offering value-for-money services. Procurement policy report (2011) highlighted that cost effectiveness refers to preventing excessive expenses and delays for a department or its suppliers and monitoring contracts to ensure they provide the expected benefits. According to the procurement general guideline issued by SA National Treasury (2005:4) this pillar mandates that the public organisations are required to purchase goods, services and works that maximise the necessary standard for quality. Therefore, the purchase of goods and service should be provided on reasonable cost and quality.

- **Open and Effective Competition**: refers to the laws, regulations, practises, and processes that were implemented and are transparent, standardised, and readily available for all parties to compete openly and fairly.

- **Ethics and Fair Dealing**: For the government to provide high-quality services, it is essential that good governance and ethics are respected. Effective moral governance is a key factor in the creation of a good, capable state. Ambe and Shongwe (2018) state that the achievement of government policy goals depends on compliance with procurement laws, regulations, norms, and standards. In this case, it is necessary to increase ethics, integrity, openness, and accountability to improve public sector performance.

- **Accountability and Public Reporting:** The National Treasury (2005) published general procurement states that accountability for goals, actions, and results is required of both individuals and organisations, who are obligated to practise openness and transparency in their management. Muchainyerwa (2013) and Munzhedzi (2016) argue that administrative officials in public institutions are ultimately responsible for procurement decisions and should make sure that those decisions are justifiable and in the organisation's best interests.

- **Equity:** To ensure a commitment to readdress historical disparities by observing particular regulations. The South African government procurement procedure is supported by this fifth-pillar equity. By encouraging all enterprises that want to do business with the government*, the Preferential Procurement Policy Framework Act*

(Act 5 of 2000) places emphasis on the acceleration and commitment to economic growth. Including small, medium and micro enterprises (SMMEs); historically disadvantaged individuals (HDIs); chances for women and physically challenged people, and additionally support local produced goods (National Treasury, 2012).

2.5. E-procurement adoption in an organisation

The impact of internet innovations has had significant effects on how business is done, people, and organisations are becoming connected (Gunaserekan & Ngai, 2008). In contrast to the traditional method, technology makes almost everything simpler and more straightforward. In the current day, technology has a major influence on procurement processes. Tassabehji and Moorhouse (2008) argue that considerable changes in procurement practises during the past decade have had an impact on the company's environment. This change has been prompted by a number of causes, including expanded worldwide market possibilities, technical developments in internet-based systems, accessibility to complex computer programmes, outsourcing, and electronic procurement (Tassabehji & Moorhouse, 2008; Gunasekaran, McGaughey, Ngai & Rai, 2009). The use of e-procurement systems enables the paper-based routine tasks to be automated in most of the transaction processing. Gunasekaran *et al.* (2008) argues that, in a diverse geographical marketing environment, e-procurement is becoming a crucial instrument for automating procurement.

Organisations in both the public and corporate sectors identify the electronic procurement system as some technological capabilities that are needed for redefining the procurement function (Ilhan & Rahim, 2013). Innocent and Kalaskar (2016) state that organisations have implemented e-procurement for business operation to improve productivity, easy workload, eliminate paper-based procurement, sustainability, and eliminate geographic barriers, among others. More (2016); Rahman, Radzai, Hamdan, and Musa, (2019) emphasised that the adoption of e-procurement in an organisation intends to enable the reduction in duplication of labour and expenses in both suppliers and organisations.

Furthermore, Ronald and Omwenga (2015) endorse that in most organisations that have adopted e-procurement have shown improved procurement performances. Sithole (2017) also noted that e-procurement is a strategy that is considered to provide exceptional value for money and growth for emerging businesses that help the growth in the country’s economy by using electronic procurement, businesses will be able to transact more quickly and with greater transparency, which will foster stronger relationships with their suppliers (Gulwa 2017). Chebe

and Kihara (2022) state that the purpose of adopting e-procurement as a strategic operation of the organisation is to eliminate the difficulties associated with traditional procurement procedures.

Considered the lengthy stages of traditional procurement procedures. Heikkilä, Hallikas, and Saarela (2017) state that e-procurement encouraged straightforward processes and more integration between buyers and suppliers, leading to more efficient procurement practises. Mpehle and Mudogwa (2020), noting that the system facilitates and the easy access of procurement while offering a simple and safe submission and storage of documents, reducing the need for labour-intensive handling of hard copies and their duplications.

2.6. Factors influencing the adoption of e-procurement in an organisation.

E-procurement is the use of electronic technologies to automate and streamline the procurement process. It can help organisations reduce costs, improve efficiency, and increase transparency. However, there are a number of factors that can influence whether or not an organisation adopts e-procurement. The variables influencing the adoption of e-procurement in an organisation vary by organisation and by nation. The deployment of the e-procurement system has been the subject of several research, including in South Africa (Duma, 2018; Mgidlana, 2013; Mphele, 2020; Antony 2018; Myataza, 2015), conducted on several significant factors that would greatly influence the adoption of e-procurement technology. When Mgidlana (2013) studied the factors influencing the adoption of e-procurement from a plumping supplier's perspective. The study noted that the use of information systems in organisations promotes a general increase in the free flow of important information, which improves the ability of buyers and suppliers to make decisions.

The author further pointed out that these factors also included perceived benefits of improvement in operations, cost savings, and positioning within the marketplace. While Laryea and Ibem (2015:372) stated that speed, lower cost of transaction, and ease of use are considered positively the highest influence for the adoption of e-procurement. Additionally, Ronald and Omwenga (2015) in their study of factors influencing the adoption of e-procurement found efficiency in job delivery and eliminating geographic barriers to participation in procurement activities. And Mohd Daud, Mohammad; Azmi and Mohamed (2013) noted that perceived ease and usefulness of e-procurement systems, attitude and intention were identified as factors

influencing the adoption of the application. Such complexity included (Luay Daoud & Ibrahim, 2019; Ibem *et al.,* 2018, and 2021; Mose *et al.,* (2013) also state that such factors include supplier adoption, system integration, top management, support and change management among others. The need to improve procurement activities is becoming an important agenda for most organisations.

In order to enhance the effectiveness of corporate operations, including supply chain activities, organisations have used information and communications technology (Laryea, Ibem, Pagiwa and Phoi (2014:9). The authors further noted that the Gauteng government built the System Administrative Processes (SAP) and the Gauteng Shared Services Centre (GSSC) as the current electronic systems supporting procurement in the province. The systems are used to manage requisitions and data and pay contractors and suppliers. Furthermore, information technology (IT) has influenced the way of human life, work environment, and education. Information technology has become a possible solution to many administrative problems. Moreover, businesses that have adopted e-procurement must comprehend the goal of doing so. It requires thorough consideration of how e-procurement will impact a firm and its strategy, as well as the areas in which it will provide both financial and other benefits. Chong (2013), Huang and Li (2014), and Razali and Aqlan (2015) state that the adoption of e-procurement in an organisation is influenced by various factors, including organisational culture, technology readiness, and perceived benefits of the system among others. Furthermore, the drivers and perceived factors behind adopting electronic procurement technologies vary depending on the industry, sector and country in question, however some common themes emerge, including improved efficiency (Chong, 2013). Some of the common drivers and factors related to the implementation are as follows:

2.6.1. Organisational factors influencing the adoption of e-procurement.

Procurement consumes the majority of organisational resources, and the majority of organisations have invested in these operations (Mwita, Mwaighacho, & Azanlerigu, 2017). Organisational factors refer to all characteristics that influence the way the organisation operates. These characteristics include the policy of organisation, size, and culture of the organisation (Muriithi & Senelwa, 2018; Bilali & Bwisa, 2015; Mose *et al.* 2013). Adding that, Mukulungui (2016) noted that the organisational factors are operational facilitators and barriers that are proactive in nature and significantly impact the performance and use of resources at an organisation's disposal.

Businesses are digitising their businesses and making significant investments in their IT infrastructure, with e-procurement playing a significant role. Organisations adopt e-procurement systems due to perceived benefits in gaining access to large markets (Ibem *et al*., 2017); Mushi and Nsimbila (2022) noted that the structure of an organisation, employee empowerment, collaboration, and organisational characteristics are the main signs of e-procurement adoption. Supported by Rahman Seresht, Alizadeh and Abdullahi, (2017) that the organisational structure that supports the flow of communication between management and lower-level staff has a significant impact on the easy adoption of e-procurement. This implies that a solid organisational framework that promotes easy communication among firm stakeholders makes it easier to embrace new technologies, as employees can readily interact with top management. The operational environment, organisational characteristics, and the features of e-procurement technology are some of the factors that might influence an organisation's decision to adopt e-procurement.

2.6.2. Perceived environmental factors influencing adoption of e-procurement

The environmental factor describes events that are mostly outside the control of the organisation but have a beneficial impact on its ability to make strategic decisions. Moreover, an environmental factor is defined as an external element that may hinder an organisation to adopt e-procurement. The level of use of e-procurement within organisations is positively correlated with the level of e-procurement between peer organisations (Daoud & Ibrahim, 2018). Mgidlana (2013); Lutfi, Idris, and Mohamad (2016) argues that the supplier’s readiness, and competition pressure in the market can push organisations to implement the adoption of new technologies. Muriithi and Senelwa (2018) further noted that organisations are utilising information systems in order to achieve the edge of business effectiveness, efficiency, flexibility, achieve electronic trading and broaden the marketplace. The advent of information systems has risen and forced organisations to move from traditional operations to automation. Ibem, Aduwo, Tunji-Olayeni, Ayo-Vaughan, and Uwakonye (2016) argue that organisations implement electronic procurement to align with the technological trends within the world and extent to which its technologies and tools are easy to use.

2.6.3. Technological factors influencing the adoption of e-procurement in organisations.

Access to technical resources has be determined which is crucial for the effective adoption of information systems to be effective (Chen & Guo, 2015). Tran and Huang (2014) state that the

use of technological resources is a significant factor in the successful adoption of information systems. Daoud and Ibrahim (2018) further state that an organisation's level of technical innovation and technology readiness is a driving force behind the implementation of e-procurement systems. The adoption of innovation can be greatly influenced by the perceptions of the company that is adopting it. This may include positive or negative views of new technology, depending on how supportive the company's leadership and culture are towards change. Laryea *et al.* (2014) state that the level of the information technology (IT) infrastructure of an organisation is essential to create an environment that is conducive to the efficient operation of an e-Procurement system. Sufficient connectivity and helpful system developers are required to ensure ongoing internet connectivity. The IT infrastructure is designed to support the software, hardware components, stable power supply, adequate servers, backups, and network that would connect all the different parts of an organisation's information technology system.

2.6.4. Management support on the adoption e-procurement for an organisation

Top management support is necessary for the objectives of change to be aligned and committed to by all involved. Daoud and Ibrahim (2018) argue that top management determines positive and negative indicators for the adoption of organisational technology innovations. Tsuma and Kanda (2017) state that companies incorporate innovation technologies as part of their overall business strategy, hoping that this will lead to improved performance and increased competitiveness. Ronald and Omwenga (2015) state that the successful adoption of information technology is greatly influenced by the company's management characteristics, including financial allocation, strong central direction, and staff training. The benefits of training employees include their ability to be flexible and productive in the workplace (Friedman, 2019; Human Resource Management (HRM), 2019). This is because they are skilled in multiple areas, allowing them to better serve customers and meet organisational objectives.

2.6.5. Government mandate and the adoption of e-procurement for an organisation.

The role of the government is to provide various activities for the country to function economically at a level necessary to ensure an internationally competitive economy and a well-functioning society. Such activities include the provision of procuring goods and services, among others. Typically, a significant portion of a nation's economy comes from government procurement (Ambe, 2016; Anthony, 2018). It is the way for government to procure goods and

services in order to achieve the best value for money. (Anthony, 2018) state that the government's commitment to instruct the implementation of the e-procurement reform in the consistency of transparency, accountability, promote principles of good governance and promote competition. In addition, government regulates and sets guidelines for procurement to achieve its goals. Sithole (2017) states that the purpose of these rules is to establish the standards of conduct, ethics, and accountability that the government expects from its public servants and to demonstrate its commitment to a procurement system.

2.7. Perception of Organizational Performance with the Adoption of E-Procurement

The adoption of e-procurement has the potential to significantly improve organisational performance, but the perception of its impact varies widely among stakeholders. While there is a growing body of evidence that e-procurement can lead to improved organisational performance, it is still necessary to better understand how stakeholders perceive its impact. This evaluates the organisation's performance and then offers suggestions for changing organisational infrastructure and behaviour (Kumar & Suresh, 2017). Strategies are put in place to achieve the organisation's desired objectives of the organisation. The ideal goals of organisational performance are to increase company effectiveness and efficiency (Ajuna, 2018; Samoei & Ndede, 2018; Masudin, Aprilia, Nugraha & Restuputri, 2021). Furthermore, Oppong (2020) states that the other primary goals of organisational performance are to target continuous improvement.

In addition, the management of an organisation's supply chain relies on procurement to purchase products and services. Adopting an efficient procurement system improves the performance of the procurement department (Kumar & Suresh, 2017; World Bank, 2017). This helps decision makers understand how numerous policy objectives interact and how policy effects on the overall effectiveness of the procurement system (Kusek & Rist, 2018). Any organisation's primary goal is to constantly outperform its rivals, provide sustained, better returns to its stakeholders, and to satisfy other shareholders while also delivering on its commitments to other shareholders. One of the most important aspects of organisations is the evaluation of how well businesses accomplish their goal (Oppong, 2020).

The globe has continued to see significant advances in information, communication, and technology, and consumer awareness of goods and services from other countries has grown

(Chin, 2019). Furthermore, international relations, cooperation between nations, as well as the convergence of sociocultural orientation, have all improved due to the great rise of international commerce (Daniels, Radebaugh & Sullivan, 2018; Buckley & Ghauri, 2015). Furthermore, information technology has a huge impact on an organisation's performance, establishing staff competences for procurement and enhancing internal operations (Banerjee & Weiss, 2015). E-procurement systems change the process of the procurement operation and offer an opportunity to increase operational activities of the organisation. Benzidia and Makaoui (2018) argue that by using computerised tools and solutions to create purchase procedures, businesses have profited from the development of information and communication technology. By streamlining the purchasing process and providing the data required to make better informed decisions about purchases, e-procurement systems play a crucial role in business-to-business purchasing.

Hung, Lin, Tai, Ho and Jou, (2014), further agree that organisations have embraced the benefits of e-procurement and have become a crucial strategic option for increasing internal level and inter-organisational process efficiency. Chegugu and Yusuf (2017) cite how the approach has increased service speed while taking the time involved in choosing the correct provider into account. The benefits and factors associated with the adoption of e-procurement have a significant impact on the organisation’s performance. Furthermore, the implementation of e-procurement has gained more attention by organisations due to the potential benefits and has proven to be a key indicator of company performance. Figure 2.3 below presents the impact of adoption of e-procurement.

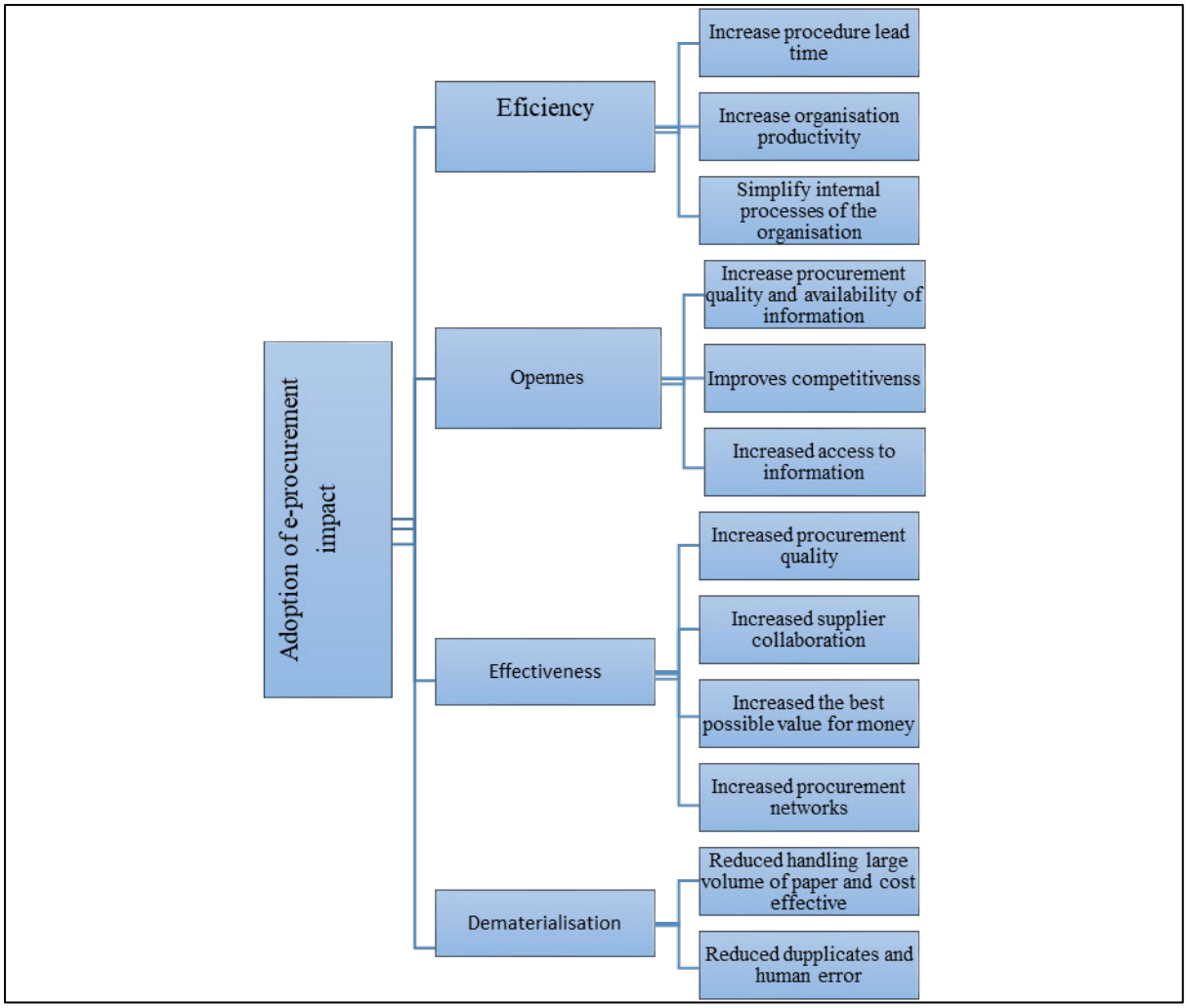


Figure 2. 3: The impact of the adoption of e-procurement (Source: compiled by the author)

It is undoubted that e-procurement has modified the procurement procedures of goods and services. The movement to implement the automation of the procurement process has been acknowledged in organisations, both public and private (Anthony, 2018). In addition, Innocent and Kalaskar (2016) state that the implementation of e-procurement improves traditional procurement processes to make the processes of purchasing simpler and more efficient. The aim is to promote the dematerialisation, openness, efficiency, effectiveness, and competitiveness of the organisation and also meet the technological trends. Mgidlana (2013) emphasised that by adopting e-procurement, showed an increase in organisation's efficiency and capacity to better control costs, leading in a supply chain process that is effective. While Chen, Bretschneider, Stritch, Darnall, and Hsueh (2021) emphasise that organisation adopts electronic procurement to centralise the procurement processes to promote the openness,

increase organisation productivity, and increase the scope of the procurement market. In addition, organisations implement e-procurement to promote organisational performance.

2.8. Barriers on adopting e-procurement in an organisation

In the current day, dominated by globalisation and information technology, businesses have used ways of operating to meet up with the rapid changes. The adoption of technologies has made major changes in the way transactions are carried out in the supply chain. The adoption has taken centre stage in the management of an organisation's supply chain, including the Ethekwini Municipality and the Western Cape Provincial Treasury, where it has transformed supply chain networks enabling organisations to streamline their procurement processes (Chopra & Meindl, 2016; Frambach & Vlachos, 2016). Furthermore, by facilitating efficient procurement, coordination, cooperation, and information exchange between supply chain partners, e-procurement technologies aid in the integration of the procurement process throughout the supply chain (Monczka *et al.,* 2020; Baily *et al.,* 2019). Mose *et al.* (2013) state that electronic procurement has emerged as one of the most successful applications of electronic commerce, implemented by numerous companies seeking to improve their operational processes. Furthermore, Kamotho (2014) argues that the e-procurement movement is quite extensive, including taking strategic actions, and may be utilised to reorganise the entire purchase process. Notably, Tutu, Kissi, Osei-Tutu, and Desmond, (2019), state that despite the potential benefits of the implementation of e-procurement, the process of adopting the system has revealed various barriers and continues to be more complex.

Straatmann, Kohnke, Hattrup, and Mueller (2016) and Wahyuni, Wardana, Yasa Sukaatmadja, and Setini (2020) noted that the state of organisation culture, Caldeira and Ward, (2013) and Duma (2018) state that the level of education and technology, while Mgidlana (2013) states that suppliers and customers' perspectives have an impact on the use of e-procurement. The adoption of e-procurement is a relatively new theme of development in many business applications. Literature (Laryea, Ibem, Pigawa, & Phoi, 2014; Ibem, & Laryea, 2015; Nawi, Roslan, Salleh, Zulhumadi, & Harun, 2016; Rukuni, Maziriri, & Mulaudzi, 2020) has shown that the implementation and adoption of e-procurement is prone to potential challenges as a result of organisations' readiness, top management support, lack of procurement skills, internal support as in employee resistance to change, investment in software installation and security systems among others. The following are other barriers associated with adopting the electronic

procurement system as supported by the various authors (Laryea & Ibem, 2014; Innocent & Kalaskar 2016).

- Ineffective administrative: Several special rules and guidelines have been devised for procurement procedures. 'These standards include audit, accountability, and compliance standards with national and international laws to ensure supply competition and transparency in contract awarding' (National Treasury, 2005).
- Organisations have difficulties in executing the digital transformation due to end-user comprehension and acceptance of technology, as well as their readiness to change internal business procedures.
- The instability of information technology, where network infrastructure problems might lead to delays and missed deadlines Issues about verification, confidentiality, and privacy.
- Factors such as lack of security measures when critical information might potentially be stolen through well-known computer scams.
- Compatibility issues with partners in the supply chain and other external parties where external parties are unwilling to cooperate electronically. This challenge is also contributed by the lack of level of education on technology systems and inadequate IT infrastructure of suppliers. In this case, the issues make it difficult for suppliers to engage and understand the system processes, making it difficult for auditors to predict the fairness that organisations are willing to avoid.
- High investment costs for software applications, where organisations are unable to afford and invest in new software. In addition, the lack of adequate IT software that will carry out the e-procurement processes.
- Lack of expertise and understanding in e-procurement. Mostly personnel-related concerns, such as older generations that have not kept up with advancements in IT related industries but who still rely significantly on conventional forms and methods of procurement.
- Lack of flexibility in the paperwork and procedure. Many organisations cannot manage with the enormous amounts of paperwork involved in approval of purchase order

processes, invoice payments, and procurement procedure. The procedure of filing and storing invoices related paper burdens organisations with increasing document storage costs. Additionally, because they were based mostly on manual operations, the methods for settling invoices were incredibly inefficient.

- Failure to comply of an organisation's culture and objectives. Challenges include a lack of a defined company philosophy, a solution that is not universally accepted, a lack of leadership, rigid central control, reluctance to change, and poor information quality, to name a few.

Despite the benefits that electronic procurement has, the findings by Duma (2018: p24) argues that people living in underprivileged neighbourhoods are faced with insufficient network connection and many new contractors who might not have invested in the IT infrastructure would be disqualified from participating in electronic procurement.

2.9. Benefits of adopting e-procurement in an organisation

As a result of the adoption of procurement cycle automation, private and public organisations have approached the adoption of e-procurement to make the supply chain functions more observable (Kumar & Singh,2018). Various sectors around the world have embraced the implementation of e-procurement, such nations include Kenya (Kinoti 2013); Tanzania (Suleiman, 2013); Nigeria (Adebayo & Evans,2015); USA (Bromberg & Manoharan, 2015); Malaysia (Nawi, Deraman, Bamgbade, Zulhumadi & Riazi, 2017); Ghana (Tutu, Kissi, Osei-Tutu & Desmond, 2019.), and in South Africa (Duma 2018, Ibem & Laryea 2015, Mothibi, 2020) for the acquisition of products and services from suppliers. This will establish a competitive, equitable, and good value for money, with a transparent environment.

Marei (2022) emphasise that it enables organisations to streamline supply chain processes, eliminate duplicates and errors, auditable track of transactions, reduce turnaround time, and lower business cost. Given the benefits, organisations stand to benefit when adopting e-procurement systems, most of them should have adopted them (Mgidlana, 2013; Ibem & Laryea, 2015). Additionally, the adoption of an electronic procurement system expands the range of services that can be offered while simplifying supply chain activities. E-procurement has gained significant technology advances in recent years and is now commonly used in the 21st century.

Luay Daoud and Ibrahim (2018, 2019) argue that the adoption of electronic procurement has been proven to benefit the organisation in various ways, such as creating competitive advantages and increasing competition in the market. With the implementation of e-procurement, buying and selling transactions are more efficient in terms of time and cost. (Mafini, Dhurup, & Madzimure, 2020). The following are the benefits of having an effective e-procurement system (Mpehle & Mudogwa, 2020; Mgidlana, 2013; Mose, Njihia & Magutu, 2013).

- With the implementation of e-procurement, the platform makes it possible to buy goods and services locally and from around the world, being able to eliminate geographical barriers.
- The e-procurement system allows the organisation to be more effectively and conveniently keep track of all the tasks and services provided.
- The use of an electronic procurement system improves supplier engagement and enhances accountability in works and services.
- Electronic document delivery is quicker than the more time-consuming paper-based procedures, and the e-procurement system lowers procurement expenses.
- Using an electronic procurement system reduces information reliability problems, inaccuracies, and human data entry mistakes.
- Organisations that have embraced the adoption of e-procurement have seen decreased maverick spending.
- With the use of e-procurement, organisations can streamline the procurement and logistics processes that were previously carried out in each location where the company conducted business.
- E-procurement enable improved management and better supplier control, in other words buyers are able to find the suppliers with the best pricing and quality.
- Internal control procedures are facilitated and accelerated.

- The benefits of e-procurement include the centralised system that assists organisation with monitoring of spending expenses, involving the suppliers in the purchasing process, while developing a stronger relationship with them.

Doherty, McConnell and Ellis-Chadwick (2013) further endorsed that firms that have adopted the e-procurement systems have seen improvement in the organisations performance, where all valid invoices were able to be paid within 30 days. Mgidlana (2013) further argue that while streamlining operational procedures, e-procurement provides management the ability to better manage the business. Furthermore, Mose, Njihia and Peterson, (2013) states that major changes in the operation and status of organisational procurement have been prompted by the introduction of the Internet as a platform for business systems. Furthermore, the significant use of e-procurement has no time limitation and can be used at any time of the day if the Internet is connected. Moreover, the system set up checkpoints where the flow of orders across the system are traceable.

2.10. Gunasekaran and Ngai Model: A Theoretical framework

This theoretical section aims to critically examine and discuss the key aspects of their framework, shedding light on its relevance. Theoretical frameworks connect the components of social research (Ngulube, 2017). Theoretical frameworks emanate from theories; therefore, understanding of what a theory is can help us to easily grasp the concept of theoretical frameworks and their purpose and role in scientific research. Leedy and Ormrod (2014) consider a theory to be an organised set of ideas and guidelines developed to describe a certain occurrence. Furthermore, Babbie (2016), on the other hand states that theories can guide and shape research projects by directing attention to likely findings through empirical observation.

The framework proposed by Gunasekaran and Ngai in their seminal 2008 paper, "A framework for successful implementation of e-procurement," stands as a cornerstone in the realm of electronic procurement systems. In an era marked by the widespread influence of digital technology on various aspects of business operations, electronic procurement has emerged as a crucial tool for improving supply chain efficiency, cost savings, and overall competitiveness (Altayyar & Beaumont-Kerridge, 2016). As organisations navigate the complex landscape of implementing e-procurement solutions, the framework presented by Gunasekaran and Ngai offers a compelling and insightful guide. Although acknowledging its value as a starting point

for organisations embarking on the e-procurement journey, it is imperative to assess its contextual applicability. Through this exploration, the researcher seeks to provide a comprehensive understanding of the framework's place in the ever-evolving landscape of electronic procurement, thus equipping organisations with the knowledge to adapt and optimise its principles for their unique circumstances.

Through extensive literature research, the researcher found that the factors mentioned in the Gunasekaran and Ngai (2008) model are relevant to the adoption of e-procurement in SMEs and can be applied in public sector context. Adebayo and Evans (2015) adopted the theory to guide their study on the adoption of e-procurement systems in developing countries: A Nigerian public sector perspective. Although Altayyar and Beaumont-Kerridge (2016) used the models to guide the study on external factors affecting the adoption of electronic procurement in Saudi Arabian SME. Furthermore, Mafini, Dhurup and Madzimure (2020) presented the theoretical framework to direct research on e-procurement, supplier integration, and supply chain performance in small and medium businesses. The theory was deemed suitable for this study as it can be used whether one is focusing on the private or public sector.

2.10.1. The Efficacy of the Model

The utilization of the Gunasekaran and Ngai (2008) framework in the context of e-procurement adoption is motivated by several compelling factors. The framework, as proposed by Gunasekaran and Ngai, serves as an invaluable resource for organizations seeking to navigate the complex landscape of electronic procurement systems. Two key motivations for employing this framework are:

- **Emphasis on Benefits and Importance**: The framework extensively highlights the benefits and significance of electronic procurement, shedding light on the potential advantages it can offer to organisations. In an era characterised by rapid technological advancements and globalised markets, e-procurement plays a pivotal role in improving supply chain efficiency, reducing costs, and improving overall competitiveness. The framework underscores these benefits, motivating organizations to harness the transformative power of electronic procurement.

- **Identification of Critical Success Factors**: Implementing e-procurement can be a complex and multifaceted process, often fraught with challenges. The Gunasekaran and

Ngai framework excels at identifying and delineating the critical factors essential for the success of e-procurement adoption. By providing a structured approach to understanding these success factors, the framework equips organisations with the necessary knowledge to mitigate potential pitfalls and optimise their e-procurement strategies.

Moreover, the framework transcends being a mere theoretical construct, as it offers practical guidance for organisations to align their e-procurement initiatives with industry best practises and contextual needs. As a result, it not only motivates but also empowers organisations to make informed decisions, drive strategic e-procurement implementation, and ultimately reap the rewards of enhanced efficiency and cost-effectiveness in their procurement processes. In essence, the framework serves as a compass, guiding organisations towards successful e-procurement adoption in an increasingly digital and competitive business landscape.

In summary, the framework proposed by Gunasekaran and Ngai (2008) provides a valuable starting point for organisations looking to implement e-procurement systems. However, it should be considered as a foundation rather than a comprehensive solution. Organisations should consider the framework alongside other contemporary literature and adapt it to their specific circumstances, while also staying up to date with the latest developments in e-procurement technology and best practices.

2.11. Chapter summary

This literature review chapter has provided a comprehensive understanding of the key concepts and context surrounding the study's focus on procurement in the South African public sector. It began by defining crucial terms to ensure a common understanding, laying the foundation for subsequent discussions. An overview of procurement in the South African public sector was presented, shedding light on the challenges and opportunities within this environment. A significant portion of this chapter was dedicated to the exploration of e-procurement and its transformative impact on procurement processes within organisations. The chapter also discussed how the adoption of e-procurement technologies can enhance efficiency, transparency, and accountability in the public sector, and how it aligns with the broader global trends in digital transformation. Furthermore, the researcher delved into the factors that influence the adoption of e-procurement, recognising that, while the potential benefits are substantial, there are challenges and determinants that need to be considered when

implementing these technologies. This understanding is crucial for developing effective strategies to promote adoption in the South African public sector.

Lastly, the researcher introduced the theoretical framework that guided the study, providing a theoretical lens through which the researcher analysed the adoption of electronic procurement in the public sector of South Africa. This framework served as a theoretical anchor, aligning the study with the existing literature, and helping to structure our research. Overall, this literature review chapter not only sets the stage for subsequent research, but also contributes to a wider knowledge base on e-procurement and its role in transforming public sector procurement in South Africa. It is our hope that the insights gained from this review informs and enrich the investigation into the practical implications and challenges of e-procurement adoption in this context.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Introduction

In this chapter, the research approach used for this study is explained in great detail. The chapter outlines the research methods, techniques, and procedures that were used to collect and analyse data. This section provides an in-depth breakdown of the research paradigm and approach, outlining the quantitative and positivist research techniques selected for this study. In the paragraphs that follow, research design is discussed including presenting the rationale for choosing the survey design, followed by a discussion of the research strategy. This chapter further highlights the study site and describes the targeted population, followed by the discussion of the sampling strategy with the probability sampling design that adopted the simple random method and detailed the sample size.

In addition, the chapter presented the data collection method and procedures where the survey questionnaire was adopted. Data quality control was outlined to support the data collection instrument used, ensuring that the measures are a consistent manner of reliability and validity of the instruments for a quantitative approach. This is followed by detailed data analysis discussing the elements used in the procedure that includes descriptive statistics, means, standard deviation, and Principal component analysis. The ethical considerations, consent form, and limitation of the study are presented. A concluding overview of the key methodological aspects covered completes the chapter.

3.2. Research methodology

The research methodology is defined as a plan that provides the overall scheme of the research, and the methodology as the process by which researchers carry out their research (Creswell, 2014). Research methodology could also be viewed as a systematic and scientific approach to conducting research. It involves the study of various techniques and methods that are used in collecting, analysing, and interpreting data to obtain relevant information that can be used to address research questions and hypotheses (Creswell, 2014). Research methodology is crucial

to ensure that the research is valid, reliable, and objective (Neuman, 2013). It involves the use of different research methods, such as surveys, experiments, case studies, and observational research, among others (Bryman, 2015; Yin, 2014). The choice of research methodology depends on the research question, the type of data needed, and the available resources. Based on the operational definition of the research methodology provided, this section presents the path followed in identifying the research approach and paradigm, research design, data collection tool, data quality control, data analysis, and ethics.

3.2.1. Research paradigm

The research paradigm refers to a guideline that directs the research to interpret the subject of the study (Creswell & Cresswell, 2017). There exist research paradigms techniques and frameworks that direct the creation, execution, and evaluation of research studies; these include positivism, interpretivism, and critical research (Babbie & Mouton, 2010; Engel & Schutt, 2013; Creswell, 2014). The study adopted positivism as a philosophical assumption. Because Glesne (2016) state that the scientific nature of positivism is in line with approaches intended to collect quantitative data for mathematical and statistical analysis to understand social events. Positivism is by nature a methodical approach to enquiry that emphasises the significance of verifiable facts. In other words, Neuman (2014) and Glesne (2016) further noted that in certain cases, relationships can be quantified accurately, and variables can be discovered. The positivist paradigm is consequently centred on using scientific procedures to analyse phenomena (Maxwell, 2013).

3.2.2. Research approach

A research approach is a comprehensive strategy or plan used by researchers to conduct their studies (Creswell & Creswell, 2017). The approach describes the techniques, stages, and approaches that will be used to achieve the study objectives (Creswell, 2014). It is a method of performing research that is organised and structured. Furthermore, the approach to the study is influenced by the research question or hypothesis, the kind of data used, and the overall structure of the research. Bless, Higson-Smith and Sithole (2013); Bernard and Bernard (2013); Bryman (2016); Creswell and Creswell (2017). Quantitative, qualitative, and mixed approaches are the three main categories of research methodology.

The study used a quantitative approach because it is a method that is systematic, objective, involves collecting and analysing data in an organised and numerical way (Kobus, 2017). Bryman, (2016) adds that quantitative approach uses deductive reasoning to demonstrate the connection between research and theory. Bless *et al.* (2013) state that the most important component of the quantitative research technique is the use of measurement and counting to compare and evaluate various variables. The method gathers and analyses data to identify patterns and averages, make predictions, and interpret findings to larger populations (Bryman, 2016). In addition, De Vos, Strydom, Fouche, and Delport (2017) indicate that the quantitative research approach uses:

- Standard measurements that helps to guarantee that all the respondents are evaluated using the same factors and criteria.
- Statistical analysis of the data is frequently used in quantitative research to test hypotheses, make predictions, and identify patterns in the data.
- Large sample sizes that are frequently used in quantitative research to guarantee that the results are representative of the population under study.
- In quantitative research, researchers seek to be impartial and truthful by limiting biases as well as private opinions during the data collection and analysis process.

Although there are a variety of alternative quantitative research designs, generally these include correlation, experimental, quasi-experimental, and descriptive. Experimental designs are frequently employed to investigate possible causal relationships between variables (Leedy & Omrod, 2013). Although quasi-experimental uses pre-existing groups or divides people into groups using a non-random approach, including age, gender, or geography (Shadish, Cook, & Campbell, 2002). The descriptive design allows the researcher to observe and measure the existing variable and characteristics of a sample (Bless *et al*., 2013; Creswell & Creswell, 2017). In addition, researchers gather survey data and perform analyses using secondary data, observations, and statistical metrics such as averages, frequencies, or correlations (Bless *et al*., 2013). This study used descriptive design because the design focusses on defining and emphasising characteristics, occurrences, and behaviours between factors (Bryman, 2016). Furthermore, non-experimental approach observes and analyses events without adjusting variables or controlling outside influences.

3.2.3. Research design

Research design is an approach that ties together all components of the study plan to address research questions and manage the variables (Sileyew, 2019; Creswell, 2014). Research design is a blueprint that the researcher adopts and follows to conduct the research study (Solanki, 2022). Kumar (2019) and Babbie (2020) further state that research design offers a researcher a plan to decide on what the researcher wishes to study, where the study will be carried out, and why the research is done. Research design can take many forms depending on the research questions, the nature of the research problem, and the resources available for the study. Some common research designs include case study, cross-sectional, survey research and longitudinal designs etcetera (Creswell & Creswell, 2017; Bless *et al.*, 2013). Kumar (2019) further noted that the primary purpose of a research design is to choose, specify, defend, and explain how the researcher will answer the research questions and objectives. In essence, the research design is a plan for the suggested study project. These types of research methodologies offer detailed guidelines for how to conduct a study.

In addition, a structured questionnaire created specifically for the study was used in the survey research design plan to collect data. Kumar (2014) states that a researcher must be able to provide strong reasons for selecting a particular design, justify the selection, and should know its strengths, weaknesses, and limitations. Reasons for choosing this particular design include the fact that it reflects positivist philosophical assumptions and align with the quantitative research approach, which has been adopted by this study. A survey research technique in quantitative research involves collecting data from a sample of people or a population to gather information about their opinions, attitudes, behaviours, or characteristics (Creswell & Creswell, 2017). Further tests for associations among variables of a population, the author states that this type of research uses questionnaires or structured interviews to gather data with the goal of generalising findings from a sample to the entire population.

Furthermore, survey research is considered the best method for collecting original data to describe the population that cannot be observed directly (Rubin & Babbie, 2016). Two descriptive and enlightening study designs were adopted to determine the effects of the phenomenon under investigation. McCombes (2019) describes descriptive research as a kind of research that focusses on identifying characteristics of populations or subjects under study. Although, Babbie (2020) agrees that descriptive research refers to events and characteristics of the population. In addition, Bless *et al*. (2013) describe explanation research as a design that

uses correlation or descriptive methods to deepen understanding of the relationship between variables.

3.2.5. Study site

The study site is described as an area or place where the study is conducted (Patter, 2015). Mpumalanga Provincial Treasury, based in Mpumalanga province. Describing a research site involves giving details such as its geographic location, physical features, and any potential environmental factors that might be important to the study. The area is 5.1 km from Nelspruit, which is the nearest town in the capital city of Mbombela. The provincial treasury is the custodian of public and municipal finance legislation in Mpumalanga province. The Mpumalanga provincial treasury provides support to all provincial government departments, public entities, and delegated province district and local municipalities with financial leadership. The Department's supply chain management system is responsible for buying, providing services, construction projects, leasing and selling public property, including selling non-needed goods. The provincial budget supply chain management department is committed to fair, open, competitive, and economical management. The provincial Treasury is committed to a strategic sourcing approach to improve the supply chain of the department. Efficient procurement remains a priority in the Mpumalanga Provincial Treasury.

3.2.6. Target Population

McMillan and Schumacher (2014) describe a population as a set of objects and cases that meet certain criteria, whether they are people, objects, or activities, and aim to generalise the findings of the study. Punch (2019), Creswell and Creswell (2017), and Babbie and Mouton (2016) show that populations are a collection of all research components that interest research. Furthermore, the meaning of the population in research is based on the group of selected samples. In this study, the Mpumalanga Treasury Division is selected, which consists of various departments with approximately 317 employees, the majority of them are not in the procurement department. Rubin and Babbie (2016) argue that although population is an opportunity to investigate an audience of interest, it is virtually impossible to include everyone. Therefore, researchers can always select samples from the population. Babby and Mouton (2010) found that the target population was derived from a collection of components interested in studying the research sample. The study had 35 participants, including 14 supply chain employees, 12 ICT employees, and 9 finance employees at the Mpumalanga Provincial

Treasury. The target audience was chosen because the researcher believed that it was directly involved in the supply chain and that it had a good chance of obtaining accurate data.

3.2.7. Sampling strategies

The sampling method involves selecting a small group of individuals or things from a larger group to represent a target group (Neuman, 2014). According to Bless et al. (2013:161), the sampling strategy is technically an accounting device used to rationalise the gathering of information and to select a suitable way to limit the range of things, people, or events from which the real information would be collected. According to Uprichard (2013), the basic goal of sampling is to use the selected sample to derive conclusions about a specific population. According to Strydom (2011), the premise underlying sampling theory is that a limited group of observations can give an indication of what can be expected in the overall population of the desired study. Given the difficulty in collecting data from all members of a population, a sampling strategy can save the researcher time and resources.

There are two types of sampling methods: probability sampling and nonprobability sampling. Each element of the population can be determined via probability sampling. De Vos *et al.*, 2017; Bless *et al.,* 2013). In other words, using randomisation, the researcher can measure the accuracy of generalisation (Bless *et al.*, 2013:167). According to Babbie and Maxfield (2014) and Leedy and Ormrod (2015), all people or elements in a population have an equal chance of being selected via the probability sampling approach. Non-probability sampling is used when a sample must be collected based on a specific demographic trait. It is unknown what the chance of choosing each sample from the population is (Vehoyar & Steinmetz, 2016). Because probability and non-probability sampling procedures are comparable, they can be used in both quantitative and qualitative paradigms (Uprichard, 2013).

This study used probability sampling to select respondents from the population. Because random selection of samples in the population as a whole gives equal chances of selection (Leedy & Ormrod 2019; Bless *et al.* 2017). The researchers of the research methodology confirm that in probability sampling, the characteristics of a sample are expected to be similar to those of the entire population (Leedy & Ormrod, 2019; Bless *et al.* 2017). Furthermore, sample selections with probability or representative samples usually use criteria similar to those of the population in question (Babbie & Mouton, 2010). Simple random sampling, interval or systematic random sampling, stratified random sampling, panel random sampling, cluster or

multistep sampling are all examples of probability sampling procedures (Bless, 2013; De Vos, 2017; Leedy & Ormrod, 2015; Babbie & Mouton, 2016). In addition, simple random techniques have been chosen because they can produce general results. Furthermore, this sampling technique offers an equal opportunity for the selection of each element in a population (Bless et al., 2013). Kumar (2019) agrees that each component of the study population must have an equal and independent probability of being chosen to refer to the sample for a design as a random sample.

3.2.8. Sample size

A sample size represents a certain size or unit selected from a larger population that the researcher selects for data collection (Leedy & Ormrod, 2015). Therefore, it is important for the researcher to prepare a sample frame before selecting units to be studied. Rubin and Babbie (2016) and Bryman (2016) state that a list of all population units that may be accessed by the study must be made in order to build a sample frame. These units could be regions, people, materials, or other items that the researcher plans to examine. When determining a sample size in quantitative research, a researcher should consider what they want to do with findings; and what type of connections the study seeks to establish (Kumar, 2019). Bryman (2016) states that there are important parts of considerations to be considered when determining a sample size.

Bryman (2016) further states that the size of the sample is influence by homogeneity and heterogeneity of the population. Where in the heterogeneous population the sample size would have to be larger to reflect the varied population, in homogeneity the amount of variation is said to be less and therefore the sample can be smaller. This study used the Raosoft sample size calculator to determine the sample size. The study used confidence intervals of 5% with a confidence level of 95%. The reason for opting for the confidence interval of 5% is to try to minimise the level of margin for errors, and thereby increasing the representation of the answers in reference to the entire reflection of the population. Therefore, the sample size of the study focused on a small number of staff mainly in ICT, finance, and supply chain divisions. About 35 staff members of the selected divisions play an important role in the procurement activities of the Mpumalanga Provincial Treasury.

3.2.8.1. Recruitment of participants

The recruitment of participants started in April 2022 and ended in November 2022. The researcher sent an email to the head of Mpumalanga provincial treasury for permission to conduct the study. Once permission had been received, the researcher was referred to the Chief Financial Officer (CFO) of the provincial treasury to engage with about the study. The researcher then had a meeting with the CFO and discussed the purpose and objectives of the study and the department divisions that were included to participate in the study. Furthermore, to conduct a planned study and collect data, a researcher must follow the policies and procedures of the Mpumalanga provincial treasury. Permission to conduct research from all parties involved in the study was acquired in accordance with these standards. This includes obtaining clearance from the head office and from the University, which served as the physical location for the study. As a result, the researcher was able to adhere to the policies and procedures when conducting scientific research.

3.2.9. Data collection method

Data gathering is an important stage in the research process. Sani (2013) describe data collecting as reliable information obtained and examined from a range of sources in order to spot trends, measure probabilities, and respond to research questions and objectives. Furthermore, data gathering includes measurements obtained by scientific observation (Bless et al., 2013). Overall, data collection refers to the process of gathering the facts and information needed to complete the study's objectives and answer the research questions. Zohrabi (2013); Cote (2021) and Simplilearn (2023) emphasise that the instruments of data collection measures vary including interviews questionnaires (telephonic, face-to-face, and individual or focus groups), questionnaires surveys and others. The data collection process for this study prepared the empirical study instrument, administering the questionnaire data collection tool. The data collection instrument for the study is addressed in more detail in section 3.2.9.1.

3.2.9.1. Data collection tool

In this study a questionnaire was used to collect data in this study. A questionnaire is a written series of questions designed to obtain information from respondents (Leedy & Ormrod, 2015; Kumar, 2019). Researchers use questionnaires to collect standardised data that is easy to compare and analyse between individuals (Bless *et al.,* 2013). Data gathering through

questionnaires is efficient since it is straightforward and rapid (De Vos *et al.,* 2017). There are two types of questionnaires identified in the literature, which includes the structured and nonstructured. Bhattacherjee (2012) emphasises that structured questions require respondents to choose answers from an option list; while non-structured questions encourage respondents to respond in their own words. Furthermore, the literature presents various procedures for administering questionnaires to respondents. Such methods include self-directed questionnaires to be completed by the respondent himself; questions that are administered by interviewers in a face-to-face meeting; questions that are conducted by telephone, and electronic questionnaires to be completed by the researcher through email or a form (De Vos *et al*., 2017 & Babbie, 2020).

The benefits of using structured questionnaires include the elimination of research bias, the preservation of anonymity, and the improvement of confidentiality, as respondents can complete surveys privately (Carpentier & Munos, 2014). Additionally, this approach allowed researchers to increase the response rate, since respondents were committed to complete the questionnaires and were aware that researchers would collect them again at a specified time (McGuirk & O'Neill 2016; Fowler 2013; and De Vaus, 2013). The researcher hand-delivers questionnaires to the respondents, who then fill in and return them. In other cases, the respondent receives the questionnaire by email and responds to the form by filling it out. With this approach, researchers can reach the greatest number of respondents, while still having the time and resources to distribute and collect completed surveys. Although the questionnaire was expected to be completed in five minutes, the researcher allowed the respondents to complete it in one to two weeks and ensured that they were ready to be collected. This exception understands that respondents need to set aside time to finish the survey to avoid interfering with their work routine. In addition, the respondents were never awarded prizes or forced to participate in the survey. All respondents gave their informed consent in accordance with the ethical standards of social research.

Furthermore, the questionnaire was divided into six sections. Section A was created to collect general information from respondents. The information acquired included the professional background, current position, years of experience, and the procurement systems in the organisation. Section B consists of the procurement structure and the procurement processes of the organisation. Moreover, Sections C, D, E, and F consist of a five-point Likert scale. Presented as follows.

Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5).

The choice of the Likert scale to use in the questionnaire was influenced by its many benefits. One of these benefits is the idea that the Likert scale is a well-used and understandable instrument for use in a questionnaire. In addition, Allen and Seaman (2007) highlighted that when a research study is using a quantitative analysis, it is simple to compute and quantify the replies on a Likert scale. The scale encourages respondents to rate how much they agree, are neutral toward, or disagree with certain assertions rather than asking for comprehensive answers or a yes or no response. This relieves the respondents of the burden of having to provide a clear response. In addition, Maxifield and Babbie (2014) argue that the advantage is that the Likert scale neutral responses option gives the respondents a choice in situations where they are not clear or uncertain. Therefore, Likert scale responses are easily encoded during analysis. Mulili (2011) states that the use of Likert scale questionnaires was the easiest, most cost-effective, and most effective way of obtaining data. Zou, Sunindijo, and Dainty (2014) agree that questionnaires are very flexible in the distribution of them, e-mail, and hand mail. Therefore, the study adopted the five-point Likert scale to improve response quality, achieve the desired response rate, and reduce the irritation of respondents who had to provide their own words to complex questions.

Furthermore, this section includes a series of questions about the following seven constructs, namely: the perception of employees toward the adoption of e-procurement was measured using seven questions adapted from Oteki (2019). Factors that influence the adoption of electronic procurement using eight questions were adapted from Addison (2016). Barriers to the adoption of e-procurement using six questions were adapted from Kamotho (2014) and Addison (2016). The benefits of adopting electronic procurement using six questions were adapted from Muthoka (2016).

3.2.10. Data quality control

In order to maintain the validity of the research findings, it is important to manage the quality of information in the research. According to Sage (2022), data quality control refers to methods and measures adopted by researchers to ensure the accuracy and quality of data collected using research methods. Data control ensures that appropriate procedures are applied throughout the data management process. Keeble (2016) emphasises that data are examined for accuracy, completeness, consistency, statistical abnormalities, and other factors that can indicate

problems. Calzon (2022) agrees that, by measuring data quality, researchers can determine data errors that must be corrected and assess whether data are suitable for the relevant task. Due to the quantitative nature of the study, researchers must consider the validity and reliability of the data. The researcher ensures that the data does not change when discussing the report to ensure the accuracy of the presentation. Mason (2001) also argued that researchers must ensure that the explanations given in research analysis are reliable, but not biased. To ensure the accuracy of the presentation, the researcher ensured that the statistics were not altered during the discussion.

In addition, this section below covers the methods used to ensure that the study has adequate validity and reliability. De Vos *et al.* (2017) state that before starting the study, the researcher must verify that the measurement processes and instruments to be used have acceptable levels of validity and reliability.

3.2.10.1. Reliability

Reliability is an empirical measure of the accuracy and consistency of theoretical ideas observed in observations (Bless et al., 2013). Chakrabarty (2013) also pointed out that reliability is related to consistency, and even if several times apply to the same phenomenon, measurement tools can achieve similar or similar results. Furthermore, the reliability of items on each set of Likert scale was evaluated using Cronbach alpha. Sekaran and Bougie (2013) argue that a 0.7 and higher reliability score are considered reliable. However, Goforth (2015) also pointed out that the minimum value of 0.6 for Cronbach's alpha is an acceptable reliability level.

3.2.10.2. Validity

Validity refers to how well an instrument measures the correctness, authenticity, sincerity, genuineness, and soundness of the topic under discussion (de Vos *et al.,*2017; Bless et al., 2013). Another aspect of validity is making sure the that the tool used in a given research measures what it is supposed to assess (Bell, Bryman & Harley 2022). The consequence is that efforts should be made to ensure that the research tool is suitable for the task at hand. As a result, the study assessed two types of validity: content validity and construct validity.

3.2.10.2.1. Content validity

Bhattacherjee (2012); Pennington (2018) describe content validity as an evaluation of how well a collection of scale items aligns with the applicable subject matter of the thesis it is attempting to measure. According to De Vos *et al.* (2017), content validity is concerned with the extent to which a measure covers the range of meaning included within the concept, and Punch (2005) agrees, stating that content validity focusses on whether the complete content of a conceptual definition is reflected in the measure. In determining content validity, Bless *et al.* (2013) is of the opinion of the problems that need to be addressed, namely, 'is the instrument actually measuring the idea that we think it is'? And 'does the instrument give a sufficient sample of items that adequately capture the idea being measured'? If the above-mentioned queries can be resolved, content validity will have been attained. The current study initially addressed content validity by formulating comprehensive research questions and, therefore, outlining all significant terms employed in the study. Additionally, by selecting appropriate respondents with adequate knowledge to respond to questions. Furthermore, the study tested the questionnaire to try to improve content validity. This was accomplished by ensuring that a sufficient sample of all the components was included in the questionnaire.

3.2.10.2.2. Construct validity

Construct validity is described as a measure that captures the underlying concept that it is intended to measure (Bhattacherjee, 2012). Bless *et al.* (2013) agrees that the extent to which test results represent the intended construct. Logical relationship among variables that play a significant role (Babbie, 2020). Brown (2010) noting that construct validity is determined by a set of attributes, characteristics, and behaviours. The current study addressed the validity of the construct by presenting the operational definitions of variables and keywords in Chapter 1. Furthermore, to improve the validity of the construct, the measurement tools used in the study had questions designed to help assess each variable and reveal any commonalities. Furthermore, this measuring tool confirmed that the construct of interest was well captured.

3.3. Data analysis procedures

Data analysis comprises consolidating data so that the findings may be interpreted (Bless *et al.*, 2013; De Vos *et al.,* 2017). According to Kelly (2023), data analysis is the procedure of modifying, processing, and cleaning raw data in order to extract useful and significant data that is helpful in judgment for researchers. McCarthy and Golicic (2005) further state that the

purpose of the data analysis is to look for any patterns in the responses to the research questions that are consistent throughout. Furthermore, there are sets of tools used when analysing data, the tools and software facilitate the processing and analysis of interactions and correlations between sets of data, and the observation of regularities for interpretation.

Data from the questionnaire survey were administered and analysed using the Statistical Package for Social Sciences (SPSS) version 28.0. The questionnaires collected went through screening in order to assist the researcher to analyse and interpret the data effectively. Additionally, codes were assigned to each question to improve the researcher's capacity to examine data, ensure accuracy, and streamline the SPSS research process. The statistics used in the study include descriptive statistics, mean scores, frequencies and percentages, and principal component factors.

3.3.1. Descriptive statistics

A descriptive statistic is a means of collecting data from a representative sample of the population for the purpose of describing and analysing data (Pallant, 2020; Bless et al., 2013; De Vos *et al*., 2017). Basically, descriptive statistics describe the fundamental characteristics of the data obtained. Du Plooy-Cilliers and Bezuidenhout (2014); and Bhandari (2023) state that descriptive statistics are utilised to present quantitative descriptions in a manageable form. Shields and Nandhini (2013) emphasise that the goal is to generate a breakdown of the information, which is then analysed using numerical data. According to Pallant (2016) and Bhandari (2023), the demonstrations are weighed according to their degree of central tendency (mean, median and mode) and degree of variability (standard deviation, variance, minimum and maximum variables, kurtosis, and skewness). Furthermore, descriptive statistics computes the data set's frequencies and percentages (Hayes, Brock, & Logan, 2022).

3.3.2. Frequencies and percentages

In this study, frequencies and percentages were used in all variables of data obtained, including general information, the positions of the respondents, and years of experience, among others. De Vos *et al.* (2017) state that a data set is a compilation of variables and values connected to a certain research topic. Turney (2022) describes frequencies as a measurement of the probability with which each potential variable or value appears in the data collection. Percentages are a widely used technique to represent the relative frequency of survey results (Pallant, 2016). According to Mayer (2015), the frequency of each category is divided by the

total number of respondents to arrive at percentages, which are then multiplied by 100. Percentages and frequencies can be represented graphically using bar graphs, pie charts, and histograms. These findings are discussed in Chapter 4.

3.3.3. Mean scores

The mean, also called average, is one of a measure of central tendency and commonly used measure, Taylor (2023). Rosell (2012) states that a mean score is equal to the product of all values divided by all possible values. An essential characteristic of the mean in this study is that the mean was used to determine all values of the views and opinions regarding the study constructs. Bhandary (2022) state that compared to all other values in the data set, the mean yields the least amount of inaccuracy. The overall scale of the mean of each of the dimensions was computed by adding the individual items and dividing by the number of items. These results are presented in Chapter 4.

3.3.4. Standard deviation

The standard deviation is a statistical measurement of the average amount of variability in a set of data (Bhandari,2022). Bryant, Fred, Satorra, and Albert (2012) further argue that standard deviations are widely used to measure data set dispersion, indicating how much individual data points differ from mean values. In this study, standard deviation and averages were given together to assess how far scores differ from averages. The standard deviation was calculated automatically by SPSS software. The results are presented in chapter 4.

3.3.5. Using Principal Component Analysis

Principal component analysis (PCA) assists statistically in organising small to large data in tables and easier-to-manage subgroups (Stevens, 2009; Jolliffe, 2002). Abdi and William (2010); Power and Pierre (2022) emphasise that the principal component analysis' goal is to extract the most important information from the database. The analysis is used to outline the quantitative dependent variables that are inter-correlated. The component structures of the under examination for this study were determined using CPA and the eigenvalues. Eigenvalues greater than zero were selected, as supported by Pallant (2016) stating that eigenvalues greater than zero show good value. These results are presented in Chapter 4.

3.4. Ethical consideration

In the scientific world, research studies require the researcher to be ethically considerate and accountable. Welman, Kruger, and Mitchell (2010), Leedy and Ormrod (2015) identified four categories of ethical consideration that are protection from harm, voluntary and informed participation, right to privacy, and participation of the researcher. The following ethics were considered while performing the research, in line with the requirements research code of ethics (Babbie & Mouton, 2010). The participants were fully informed about the purpose and procedures. No participant was pressured to participate in the study and all participants will be free to leave at any time. Participants were assured of their privacy, data confidentiality, and anonymity when it comes to data collection during the study. Data analysis and reporting will follow the ethical level of the investigation. All the approaches presented, as well as the individuals and sources used, will be acknowledged.

Researchers must follow a variety of ethical principles that are meant to safeguard the interests of study participants (Neuman, 2014). While gathering information from and interacting with respondents, the researcher must also adhere to a set of procedures and meet several conditions (Creswell, 2014). To show that the study adhered to the principles of social research, these ethical issues are examined in this section.

The researcher first obtained approval for the study from the University of KwaZulu-Natal Higher Degrees Committee. The topic of the research and the planned procedures were approved on the understanding that they would not jeopardise or violate the rights of respondents in any manner. After receiving this approval, the researcher applied and was granted permission by the Mpumalanga Provincial Treasury to do research with the selected departments. The following main ethical principles were respected throughout the course of the investigation: the right to freely withdraw from the investigation at any time, informed consent, voluntary participation, confidentiality, and anonymity. These are covered in the following sections.

3.4.1. Informed consent

Informational consent documents are usually given to individuals who need information to decide whether to volunteer for research projects through agreements. Neuman (2014) stated that the main part was to fully disclose the implications of participation to respondents and agree before participating in the study. The form of informed consent is a fundamental principle

of the ethics of research. Before completing the questionnaire, respondents were told about the purpose and focus of the study and signed the consent form. In addition, participants were informed that, if necessary, they can contact the researcher for additional information about the study or the supervisor if they suspect foul play from the principal investigator. Furthermore, respondents were also informed that the purpose of their participation in this study was purely to assist the researcher in fulfilling her academic requirement.

3.4.2. Voluntary participation

Participants were informed that they would be no benefits for taking part in the study. In other words, there were no rewards for participating (Neuman, 2014). Furthermore, those who participated in the study were not forced to participate by the researcher. Therefore, it was entirely open to the participants whether to participate in the study. The significance of this ethical issue can be seen in the fact that it provided participants with many opportunities in participating objectively to the study.

3.4.3. Anonymity and confidentiality

Pickard (2013:130) defines anonymity as "participants providing information that does not include their personal information, particularly their names." To protect the participant's identity, researchers informed participants that their names would not be included in the data analysis. As a result, only the researcher knows the identity of the participants. The anonymity of the respondent was maintained in this way. Furthermore, the study avoided demographic variables that may be related to specific respondents.

3.4.4. Protection from victimisation

Bos (2020) indicates that the researcher should protect participants from foreseeable harm. In this study there was no foreseeable harm towards the participants, thus none of them were exposed to any situation that could have resulted in physical or psychological harm. The researcher directly interacted with the participants while distributing the questionnaire and all participants were given enough time to complete the questionnaires.

3.5. Limitation and Delimitation of the study

The research is limited to the Mpumalanga provincial treasurer’s department based at the Mpumalanga government complex in Mbombela. Delimitation of the study focused on the department of IT, Supply chain, and Finance which has 35 staff members. The questionnaire

was structured, printed, distributed emailed and hand delivered to the participants aimed. The content includes factors influencing the adoption of e-procurement, views from employees towards the adoption of e-procurement, and benefits and barriers of e-procurement.

3.6. Chapter summary

The chapter on research methodology of this study applied a quantitative approach to investigate perceived factors influencing the adoption of e-procurement in the context of Mpumalanga Provincial Treasury. The overarching goal was to establish a comprehensive understanding of employee perceptions regarding e-procurement. This chapter detailed the methods, tools, and procedures used to collect and analyse data, emphasising the rigorous and systematic nature of the study. The application of a quantitative research approach allowed the collection of structured and numerical data, enabling a statistical analysis of the factors that affect the adoption of e-procurement. Through surveys, questionnaires, and data analysis techniques, this chapter laid the foundation for a robust examination of the research questions, providing valuable insights into the perspectives of employees within the Mpumalanga Provincial Treasury.

By adopting this quantitative methodology, the study was able to objectively measure and assess key variables and factors associated with e-procurement adoption. The results obtained from this research will serve as a valuable resource for policymakers, organisational leaders, and stakeholders in the realm of public procurement, shedding light on the crucial factors that influence the adoption of e-procurement in the specific context of the Mpumalanga Provincial Treasury. The chapter on research methodology not only outlined the approach used, but also demonstrated the commitment to methodological rigour, transparency, and the generation of reliable findings. Although the sample of this study was significantly small, the researcher discussed this aspect as a part of the limitations of the study. The chapter has paved the way for the subsequent chapters to delve into the analysis of the collected data and the formulation of meaningful conclusions and recommendations. The insights gained from this research will contribute to a deeper understanding of the adoption of e-procurement and have the potential to inform strategic decisions and improve the effectiveness of procurement practises in the public sector. Research findings are reported in the next chapter.

CHAPTER 4

DATA ANALYSIS AND PRESENTATION

4.1. Introduction

This chapter presents the data that were gathered in the form of survey process that support the study objectives. The chapter starts with the description and frequency of the response rate, followed by the general information about the work of the participants including the professional background, employment position, years of experience, the systems used for procurement, the procurement structure, and the types of procurement processes. The study used SPSS to present descriptive statistics, mean and standard deviations. This is followed by the Principal Component Analysis (PCA) to determine the validity and Cronbach's alpha-coefficient measures to determine the reliability of the data collected. The chapter further presents and discusses the Likert scale analysis of the data gathered.

The objectives of the study are outlined as follows

- To identify the factors affecting the adoption of the e-procurement system in the Mpumalanga Provincial Treasury.
- To determine the perceptions of Mpumalanga Provincial Treasury's employees on the adoption of the e-procurement system.
- To determine the barriers and benefits on the adoption of e-procurement in an organisation.

4.2. Response rate

In completing the data analysis for the study this section begins by providing illustrative explanation of response rate and other data analysis processes that were performed. In terms of response rate, Clardi (2021) defines it as a quantity of acceptable responses obtained from a particular target population or subgroup of interest for research study. According to Booker, Austin and Balasubramanian (2021) response rate as the ratio of the number of useable survey

units to the total number of survey samples. Most often presented as a percentage. A summary of the study's response rate is presented in Table 4.1.

Table 4. 1: The response rate of the study

Description	**Frequency**
Number of surveys distributed overall	35
Overall quantity of completed surveys	35
Surveys that couldn't be used and were discarded	2
Retained valid survey responses	33
% of responses	97.14%

The researcher distributed thirty-five (35) to the sampled Mpumalanga Provincial Treasury employees in the Supply chain, ICT and Finance Department. From the 35 distributed questionnaires, a total of 33 questionnaires were returned and 2 were unusable because they were improperly completed. The improperly completed questionnaires had double selection of responses which made it impossible for coding, consequently they were discarded. Thus, the response rate for this study was 97.14%.

4.4. General work information of the participants

4.4.1 General information results

The general work information results, which make up the very first part of the analysis of results, are presented in this section. The figures present results related to professional background, respondent’s current position, and years of working experience, a system used for procurement, procurement structure, and procurement processes.

4.4.1.1. Respondent's professional background

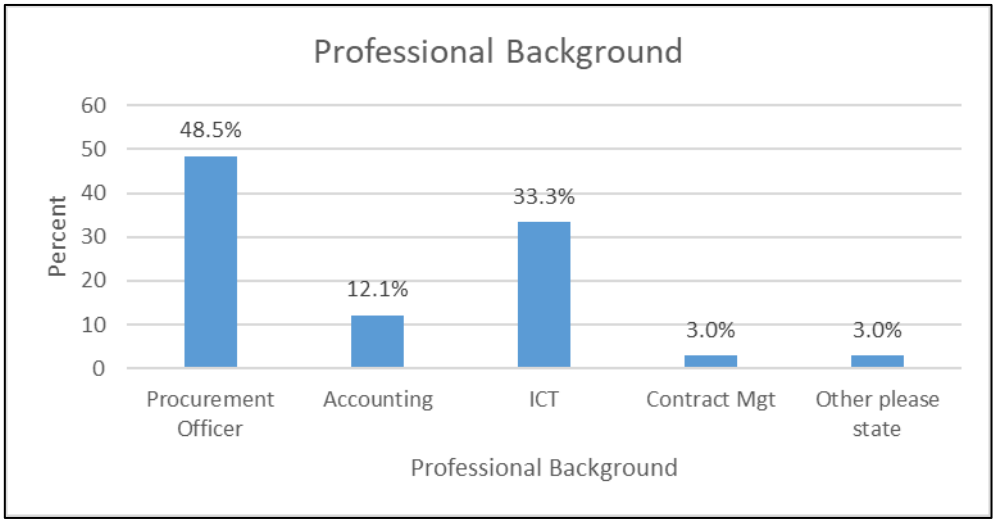


Figure 4. 1: Professional background

Figure 4.1 shows the professional background of the participants. The information collected was to determine the profession each participant holds in the organisation. Out of 33 participants, the study shows that 48.5% of the participants were procurement officers, 33.3% were ICT officers, while 2.1% were accountants, 3% were from contract management and, 3% from administration. This data affirms that the questionnaire was administered among the Mpumalanga Provincial Treasury employees in the finance department and ICT. These participants gave account of their experiences and perceptions towards the adoption of e-procurement system. These individuals have first-hand experience in procurement and supply chain as they are responsible for tendering process and procuring of good for the provincial treasury department.

4.4.1.2. Respondent's employment position

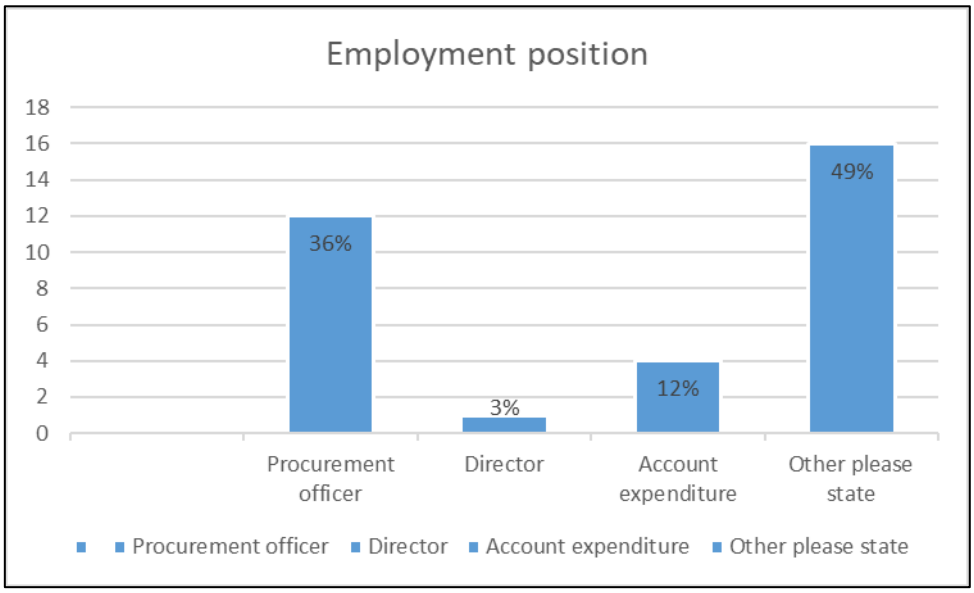


Figure 4. 2: Participant's employment position

As part of the general information profiling employees. Figure 4.2 sought to determine the employment positions of the participants. The purpose of the research was to ensure that participants were knowledgeable about the systems and procedures connected to activities in Supply Chain Management. The results show that 49% of the participants were employed in other sections of the department chosen for the study, including IT Technicians, administration, assistant manager, assistant director, managers and interns, followed by 36% of procurement officers, 12% of account expenditure and 3% of a director.

4.4.1.3. Years of working experience

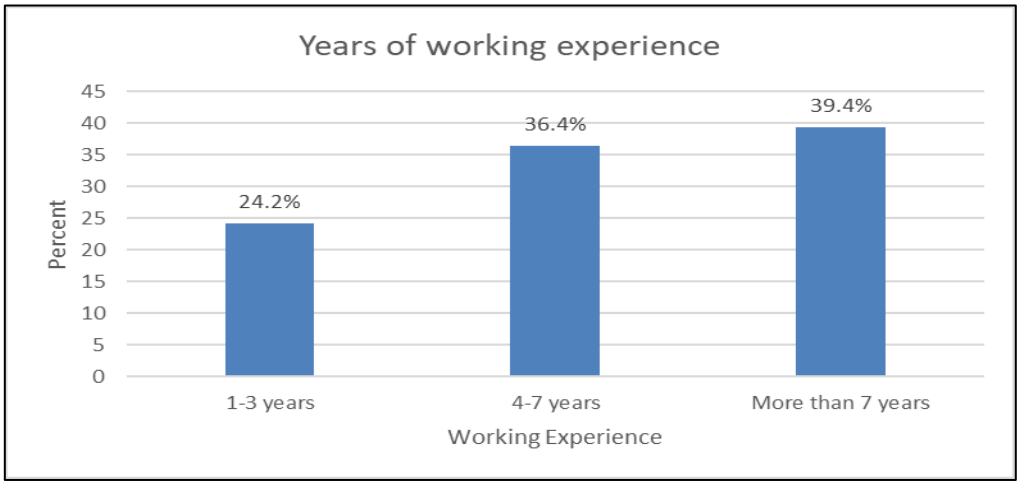


Figure 4. 3: Years of working experience

Figure 4.3 determined to show the years of working experience of the participants in operations and Supply chain divisions. The results reveals that the 39.4% of the participants have more than 7 years of working experience, while 36.4% of the participants have 4 to 7 years' experience and 24.2% of the participants have 1 to 3 years of working experience. Participants have enough competence, as seen in the bar graph, to offer comprehensive responses that the research aimed to evaluate.

4.4.1.4. Procurement system

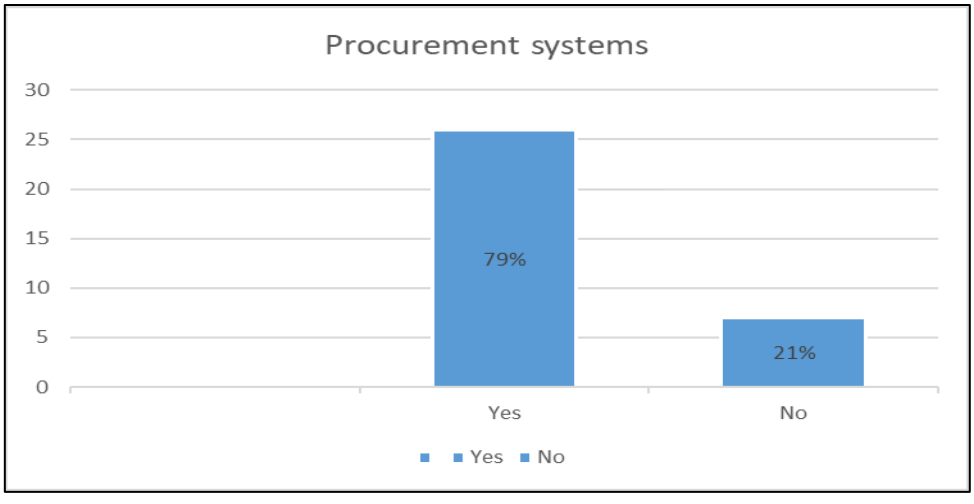


Figure 4. 4: Systems used for procurement

Figure 4.4 shows that 79% of the participants stated that the department has not fully adopted the e-procurement systems however the provincial treasury is using web-based systems for

procurement of goods and services. The procurement of goods and services are done using electronics including emails, meanwhile the tender processes are done through the Central data-based systems (CDS). The other 21% of the participants indicated that the department is not using web-based systems for procurements of goods and services. The CDS was implemented to streamline the procurement process by the National Treasury, with the support of the South African government, and increase transparency (National Treasury, 2015; South African Government, 2015). The system serves as a single source of supplier information for all government departments, municipalities, and state-owned entities.

4.4.1.5. Procurement structure

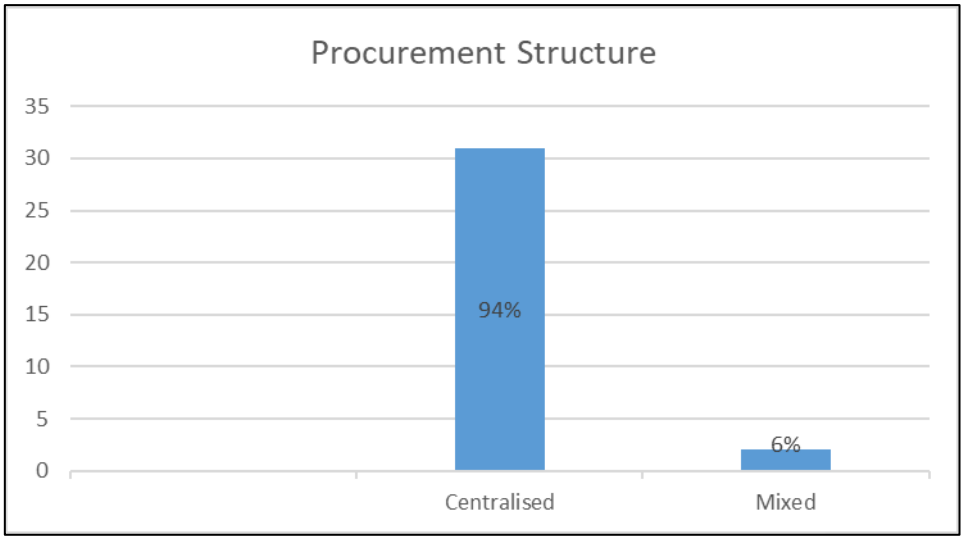


Figure 4. 5: Organisation procurement structure

From figure 4.5 it is evident that the department's procurement structure is 94% centralised and 6% indicating that the procurement structure is mixed. One common procurement structure in the public sector is a centralised procurement system (World Bank, 2020). Procurement is managed by a central procurement department. This approach helps to ensure consistency in procurement practices across different departments and agencies and can also allow for bulk purchasing and cost savings. Procurement units are required to adhere to the procurement regulations and guidelines developed by the (National Treasury, 2021).

4.4.1.6. Procurement processes of the department

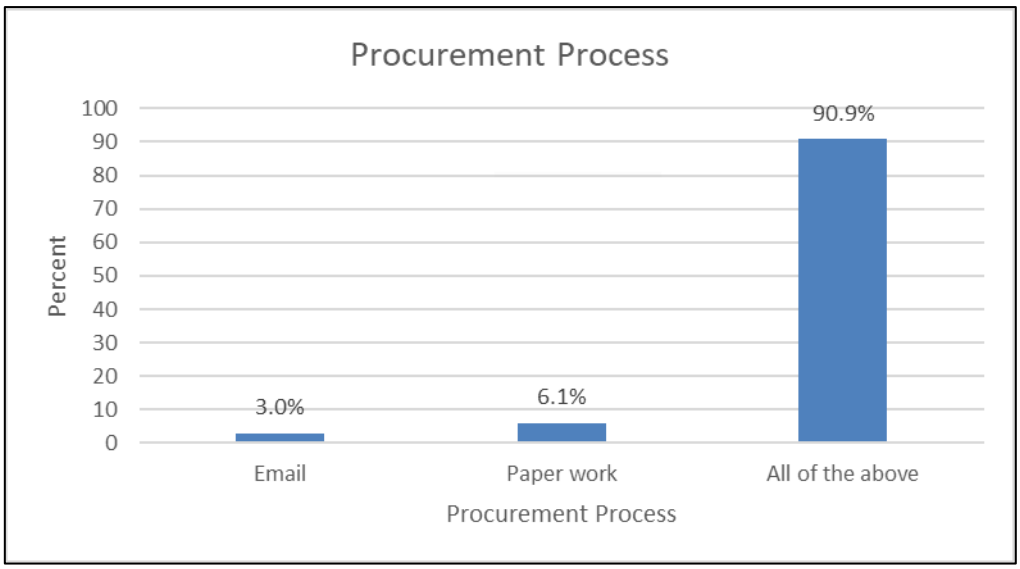


Figure 4. 6: Organisation procurement processes

Figure 4.6 reveals that the department is using the mixed method of paperwork, phone and email for the procurement of goods and services. The study shows that there is 91% of utilisation of all the procurement methods mentioned in the survey, 6% of only paperwork and 3% only, procurement processes in the department.

4.5. Analysis of survey data

This section presents the component analysis structure and Cronbach Alpha for all the instrument items that were used in the study. The analysis of the research data is presented in the form of tables and graphs. Tabulation helped to summarise the data, whereas graphs were used to present the study results.

4.5.1. Component analysis structure

Each component accounts for a portion of the overall variation in the observed variables, and the factors are always given in the order of how much variation they explain. In doing the component analysis, eigenvalue was adopted. Yong and Pearce (2013) explain that eigenvalue is a measure of how much of the observed variables' shared variation is explained by a component. Eigenvalue is simply a number that indicates how much variance in the original variables can be attributed to a specific factor. These eigenvalues are used to determine how many factors to choose. Generally, the factors that explain the least amount of variance are eliminated.

The principal component analysis procedure was performed for the following factors:

- e-procurement and organisational performance (presented on Table 4.2)
- factors influencing the adoption of e-procurement (presented on Table 4.3)
- barriers of the adoption of e-procurement (presented on Table 4.4)
- benefits of e-procurement adoption (presented on Table 4.5)

Table 4. 2: Component analysis: e-procurement and organisational performance

Item code	Items description	Component loading
PAEP1	Can improve short-term organisational performance	0.640
PAEP2	Can improve long-term organisational performance	0.620
PAEP3	Can reduce paperwork thus reduced costs	0.616
PAEP4	Can address unethical practice issues and increases transparency	0.801
PAEP5	Can improve turnaround time	0.708
PAEP6	Can better administrative costs with better effectiveness	0.809
PAEP7	Electronic payment to suppliers can improve delivery	0.558
Eigenvalue		**2.866**
Total variance explained		**40.948**

According to Table 4.2 above, the PCA retrieved e-procurement and organisational performance component with an eigenvalue larger than one. Principal component analysis (PCA) normally considers eigenvalues larger than one to be significant (Abdi & Williams, 2010). Component one was a seven-item factor with an eigenvalue of 2.866 and contributed 40.948 percent of the overall variance that is described. Items PAEP4 and PAEP6 loaded 0.8 very high on the component, PAEP5 loaded 0.7 high on the component, 0.6 loaded on PAEP1, PAEP2, PAEP3. PAEP7 loaded 0.5 the lowest on the component. Since all seven items of e-procurement and organisational performance had an eigenvalue greater than one were thus

accepted. This is supported by Stevens (2009) and Jolliffe (2002) that an eigenvalue greater than 1, implies that the primary component is effectively capturing the significance of the data.

Table 4.3. Component analysis: Adoption of e-procurement

Item code	Items description	Component loading
FINEP1	Employment of digital signature (approval)	0.688
FINEP2	The strategic necessity to compete in the marketplace	0.604
FINEP3	E-procurement make the purchasing process efficient	0.544
FINEP4	Mandatory use of e-procurement by the national government	0.646
FINEP5	Availability of IT infrastructures	0.596
FINEP6	Top management support	0.708
FINEP7	Visibility in supply chain operations	0.664
FINEP8	Provide fairness to all regardless of geographical location of the supplier	0.711
Eigenvalue		**2.698**
Total variance explained		**33.726**

From Table 4.3 the results show that the components loading extracted eigenvalue of greater than one. Abdi and Williams (2010) emphasise that Principal component analysis (PCA) normally considers eigenvalues larger than one to be significant. The components loading consisted of 8 items, had an eigenvalue of 2.698 and 33.727 percent of the total variance. Items FINEP6 and FINEP8 loaded 0.7 high on the component, FINEP1, FINEP2, FINEP4, and FINEP7 loaded 0.6 on the component. While 0.5 loaded on FINEP3 and FINEP5. Since all eight items of adoption of e-procurement had an eigenvalue greater than one were thus accepted. Stevens (2009) and Jolliffe (2002) concurs that an eigenvalue greater than 1, implies that the primary component is effectively capturing the significance of the data.

Table 4.4. Component analysis: barriers of e-procurement

Item code	Items description	Components loading
BAROE1	Availability of supporting infrastructures	0.554
BAROE2	Unstable power supply	0.774
BAROE3	Lack of training regarding the implementation and use of e-commerce systems	0.727
BAROE4	Availability of financial resources	0.686
BAROE5	Fear of Cyber security	0.596
BAROE6	Low top management support	0.686
Eigenvalue		**2.160**
Total variance explained		**35.994**

From Table 4.4 the results show that the components loading extracted eigenvalue of greater than one. Abdi and Williams (2010) emphasise that Principal component analysis (PCA) normally considers eigenvalues larger than one to be significant. The components loading consisted of 6 items, had an eigenvalue of 2.160 and 35.994 percent of the total variance. Items BAROE2 and BAROE3 loaded 0.7 high on the component, BAROE4 and BAROE6 loaded 0.6 on the component. While BAROE1 and BAROE5 loaded 0.5 on the component. Since all six items of barriers to e-procurement adoption had an eigenvalue greater than one were thus accepted. Stevens (2009) and Jolliffe (2002) concurs that an eigenvalue greater than 1, implies that the primary component is effectively capturing the significance of the data.

Table 4. 5: Component analysis: benefits of e-procurement

Item code	Items description	Components loading
BENOE1	Leads to cost reduction	0.689
BENOE2	Reduce paper consumption and other procurement expenses	0.745
BENOE3	Reduce human error	0.723
BENOE4	Increase supplier participations and competitiveness	0.532
BENOE5	Increase availability of information	0.783
BENOE6	Increase procurement quality and lead-time	0.701
Eigenvalue		**2.938**
Total variance explained%		**48.969**

According to Table 4.5, the PCA retrieved e-procurement and organisational performance component with an eigenvalue larger than one. Principal component analysis (PCA) normally considers eigenvalues larger than one to be significant (Abdi & Williams, 2010) Seven components made up component 1, which had an eigenvalue of 2.938 and provided 48.969 percent of the variance explained. Items BENOE2, BENOE3, BENOE5 and BENOE6 loaded very high on the component of (0.7), BENOE1 loaded 0.6 high on the component, and BENOE5 loaded 0.5 the lowest. Since all six items of benefits of adopting e-procurement had an eigenvalue greater than one were thus accepted. This is supported by Stevens (2009) and Jolliffe (2002) that an eigenvalue greater than 1, implies that the primary component is effectively capturing the significance of the data.

4.4.2. Using the Cronbach's Alpha reliability coefficient scale

Cronbach's alpha coefficient, according to Pallant (2016), determines the internal consistency of the data set survey. Amirrudin, Nasution and Supahar, (2021) state that Cronbach's alpha coefficients correlations represent the most widely used measure for identifying a research instrument's reliability. The survey items' internal consistency was evaluated using the scale reliability coefficients for each construct. Sekaran and Bougie (2013) state that a reliability

score of 0.7 and above is considered reliable. However, Goforth (2015) also emphasises that a minimum value of 0.6 for Cronbach's alpha is an acceptable level of reliability. Table 4.6 lists the internal consistency element coefficients for each of the four dimensions.

Table 4. 6: Reliability: Cronbach's Alpha coefficient scale

Number of items	Construct	Item questions	Cronbach Alpha
7	Adoption of e-procurement and organisational performance	1. Can improve short-term organisational performance 2. Can improve long-term organisational performance 3. Can reduce paperwork thus reduced costs 4. Can address unethical practice issues and increases transparency 5. Can improve turnaround time 6. Can better administrative costs with better effectiveness 7. Electronic payment to suppliers can improve delivery	0.7
8	Factors influencing the adoption of e-procurement	1. Employment of digital signature (approval) 2. Strategic necessity to compete in the marketplace 3. E-procurement make the purchasing process efficient 4. Mandatory use of e-procurement by the national government 5. Availability of IT infrastructures 6. Top management support 7. Visibility in supply chain operations 8. Provide fairness to all regardless of geographical location of the supplier	0.7
6	Barriers on the adoption of e-procurement	1. Availability of supporting infrastructures 2. Unstable power supply 3. Lack of training regarding the implementation and use of e-commerce systems 4. Availability of financial resources 5. Fear of Cyber security 6. Low top management support	0.6
6	Benefits on the adoption of e-procurement	1. Leads to cost reduction 2. Reduce paper consumption and other procurement expenses	0.8

		3. Reduce human error 4. Increase supplier participations and competitiveness 5. Increase availability of information 6. Increase procurement quality and lead-time	

Separate reliability tests were conducted on each of the four dimensions in Table 4.6. The seven items measured for e-procurement and organisational performance, the reliability score was $\alpha = 0.7$, eight items measured for factors influencing the adoption of e-procurement and $\alpha = 0.7$ reliability score, $\alpha = 0.6$ for barriers of e-procurement and $\alpha = 0.8$ benefits of e-procurement. All the items that were used in this study produced acceptable levels of reliability.

4.6. The descriptive statistics analysis

The survey's Sections C, D, E, and F were largely concentrated on e-procurement implementation and were measured using a questionnaire that was focused primarily on the factors influencing the adoption of e-procurement. For each of the dimensions, descriptive data were examined to determine responses, including the perception towards the adoption of e-procurement on organisational performance, factors influencing the adoption of e-procurement, barriers, and benefits of the adoption of e-procurement. The descriptive results are presented in Tables 4.7, 4.8, 4.9, and 4.10 using mean values and standard deviations. The overall scale of the mean and standard deviation of each of the dimensions were computed by adding the individual items and dividing by the number of items.

4.6.1. Descriptive statistics on the perceptions of e-procurement on organisational performance

In this section, the researcher sought to identify the results relating to perceptions of e-procurement on organisational performance. The results in Table 4.7 below reveal that PAEP2 (Can improve long-term organisational performance) and PAEP3 (Can reduce paperwork thus reduced costs) have the highest mean score of 4.55, meanwhile, PAEP1 (Can improve short-term organisational performance) have the lowest mean score of 4.15. Since all the values have a mean score of above 4, these would serve as significant evidence that the participants agree that the adoption of e-procurement by the organisation will improve the organisation performance. The overall scale of 4.39 as confirmed by the participants supports this. The

results also show that there can be a noticeable increase in productivity of the procurement operations when an organisation adopts the usage of e-procurement.

Table 4. 7: Descriptive statistics: Perceptions of e-procurement on organisational performance

Item code	Item details	N	Mean	Standard deviation
PAEP1	Can improve short-term organisational performance	33	4.15	.870
PAEP2	Can improve long-term organisational performance	33	4.55	.564
PAEP3	Can reduce paperwork thus reduced costs	33	4.55	.711
PAEP4	Can address unethical practice issues and increases transparency	33	4.30	.770
PAEP5	Can improve turnaround time	33	4.30	.585
PAEP6	Can better administrative costs with better effectiveness	33	4.45	.711
PAEP7	Electronic payment to suppliers can improve delivery	33	4.45	.666
Total			**4.39**	**.696**

4.6.2. Descriptive statistics factors influencing the adoption of e-procurement

It can be observed from Table 4.8 that 3.82 is the lowest mean that FINEP1 (Employment of digital signature, approval) and FINEP2 (The strategic necessity to compete in the marketplace) has, while 4.45 can be observed with the maximum mean in FINEP5 (Availability of IT infrastructures) and FINEP8 (Provide fairness to all regardless of the geographical location of the supplier). The scale of 4.2 overall is closer to 5. This indicates that the participants agree that implementing e-Procurement within an organisation would have a big impact. The findings of this study are in line with existing literature in that the availability of IT infrastructure and encouraging suppliers from all sectors is among the most important factors influencing the adoption of e-procurement in organisations (Ibem et al 2016; Anthon, 2018).

Table 4. 8: Descriptive statistics: factors influencing the adoption of e-procurement

Item code	Item details	N	Mean	Standard deviation
FINEP1	Employment of digital signature (approval)	33	3.82	1.185
FINEP2	The strategic necessity to compete in the marketplace	33	3.82	1.014
FINEP3	E-procurement make the purchasing process efficient	33	4.30	.883
FINEP4	Mandatory use of e-procurement by the national government	33	3.94	.966
FINEP5	Availability of IT infrastructures	33	4.42	.708
FINEP6	Top management support	33	4.45	.564
FINEP7	Visibility in supply chain operations	33	4.27	.517
FINEP8	Provide fairness to all regardless of geographical location of the supplier	33	4.45	.617
Total			**4.18**	**.806**

4.6.4. Descriptive statistics on barriers of the adoption of e-procurement

Table 4.9 below sought to describe the barriers of adoption of e-procurement. The results are discussed. From Table 4.9, BAROE5 (Fear of Cyber security) shows the highest mean, with BAROE2 (Unstable power supply) shows the lowest mean in the table. These results suggest that the participants are more concerned about the cyber securities issues. Issabayeva, Yesseniyazova, and Grega (2019) state that users and producers of digital services are at risk of cyberattacks because hackers might take their money, intellectual property, and personal information. The overall scale of 3.9 suggest that since the scale is closer to 4, the results implies that even if the organisation adopts e-procurement, it is positive that the participants believe that the organisation is vulnerable to cyberattacks and among others.

Table 4. 9: Descriptive statistics: barriers on the adoption of e-procurement

Item code	Item details	N	Mean	Standard deviation
BAROE1	Availability of supporting infrastructures	33	3.97	1.237
BAROE2	Unstable power supply	33	3.79	1.364
BAROE3	Lack of training regarding the implementation and use of e-commerce systems	33	3.97	1.185
BAROE4	Availability of financial resources	33	3.82	1.074
BAROE5	Fear of Cyber security	33	4.36	.742
BAROE6	Low top management support	33	4.03	.847
Total			**3.99**	**1.07**

4.6.5. Descriptive statistics of the benefits of the adoption of e-procurement

Table 4.10 discusses and presents the result of the benefits of the adoption of e-procurement. This table shows that BENOE2 (Reduce paper consumption and other procurement expenses) with a mean score of 4.67 is higher, while BENOE3 (Reduce human error) with a lower mean score of 4.06. The participants agree that if an organisation adopt the use of e-procurement, the company will have the potential to save on procurement expenses, reduce paper and reduce human error. This is supported by Ibem *et al.* (2016). The overall scale of the result of 4.4 implies that participants agree that implementing the e-procurement systems will benefit the organisations in many ways including the reduction of costs, increased supplier participation among others.

Table 4. 10: Descriptive statistics: benefits on adoption of e-procurement

Item code	Item description	N	Mean	Standard deviation
BENOE1	Leads to cost reduction	33	4.36	.994
BENOE2	Reduce paper consumption and other procurement expenses	33	4.67	.540
BENOE3	Reduce human error	33	4.06	.827
BENOE4	Increase supplier participations and competitiveness	33	4.45	.754
BENOE5	Increase availability of information	33	4.45	.711
BENOE6	Increase procurement quality and lead-time	33	4.48	.712
Total			**4.41**	**0.75**

4.7. Likert scale analysis

This part of the study presents the results of the five Likert scale. The participants were asked to rate their views on the adoption of e-procurement. The Likert scale is follows: (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; (5) strongly agree.

4.7.1. Perceptions on the adoption of e-procurement on organisational performance

The participants were asked to rate their perceptions towards the adoption of e-procurement. The results are presented in Figure 4.7.

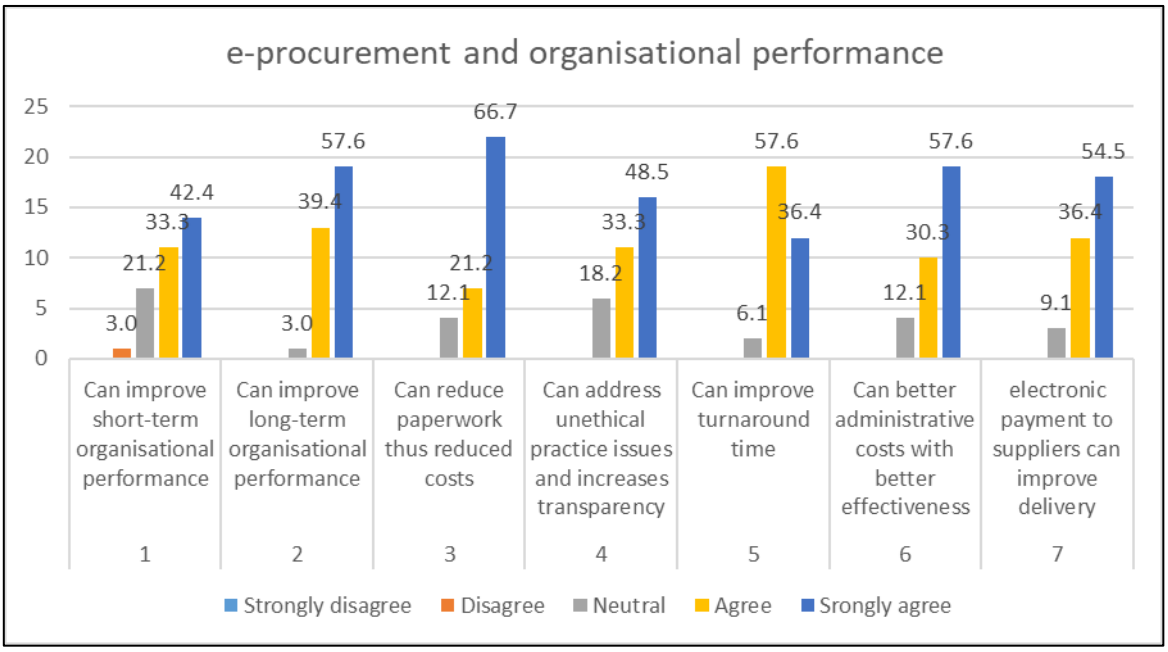


Figure 4. 7: e-procurement and organisational performance

The perception towards the adoption of e-procurement on organisational performance are presented in Figure 4.7. Which include: 66.7%(can reduce paperwork thus reduce cost); 57.6% (can improve long-term organisational performance), 57.6% (can improve turnaround time), 57.6% (can better administrative cost with better effectiveness), 54.5% (electronic payment to suppliers can improve delivery); 48.5% (can address unethical practices and increase transparency), and 42.4% (can improve short-term organisational performance). E-procurement can help organisations reduce procurement costs by streamlining processes, reducing paperwork, and eliminating manual tasks. (Lau & Lee, 2017). This can lead to significant cost savings and increased productivity in the long run (Rahimi & Kozak, 2017).

4.7.2. Factors influencing the adoption of e-procurement.

The objective of the study was to determine what factors affect the adoption of e-procurement. Figure 4.8 presents the findings.

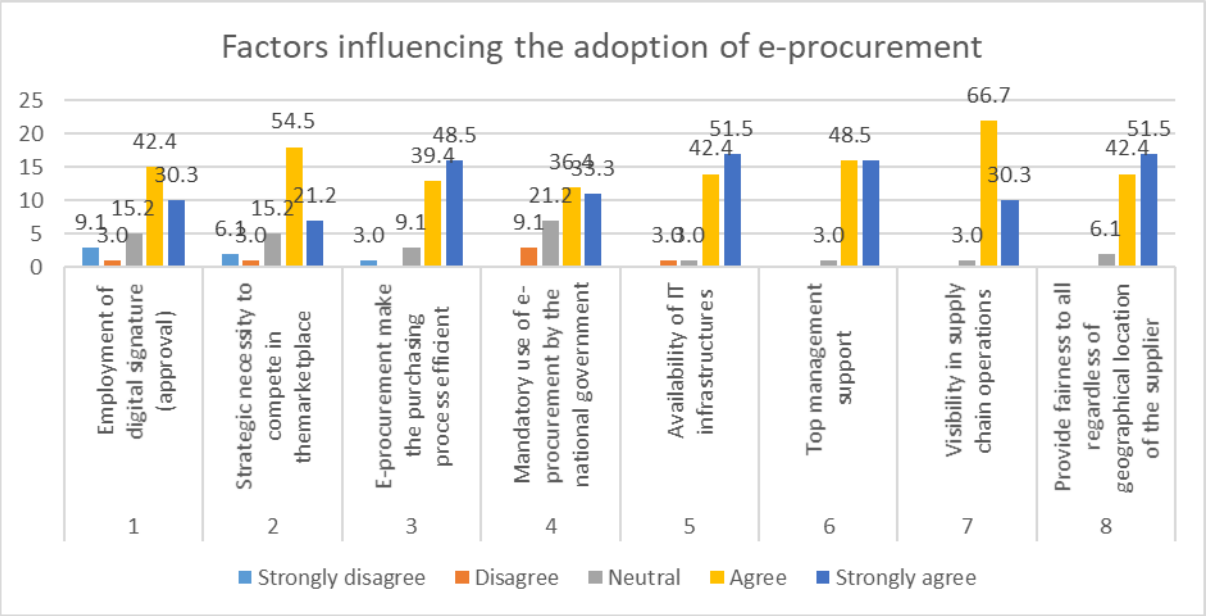


Figure 4. 8: Factors influencing the adoption of e-procurement

From figure 4.8 the participants agree that these are related factors influencing the adoption of e-procurement. 66.7% (visibility in supply chain operations), 54.5% (strategic necessity to compete in the marketplace), 51.5% (availability of IT infrastructures), 51.5% that adoption of e-procurement provides fairness to all who wish to work with the department regardless of the suppliers' geographical location), 48.5% (the use of e-procurement can improve the purchasing process), 48.5% (top management support), and 42.4% (the employment of digital signature) and 36.4% (mandatory by the national government). The visibility in supply chain operations is crucial. E-procurement can provide greater visibility and transparency in the supply chain, which can lead to more efficient and effective operations (Jafari, & Fakhrzad, 2015; Ramanathan & Gunasekaran, 2014).

4.7.3. Barriers on the adoption of e-procurement

The results from the study on the barriers of adopting e-procurement are presented on figure 4.9.

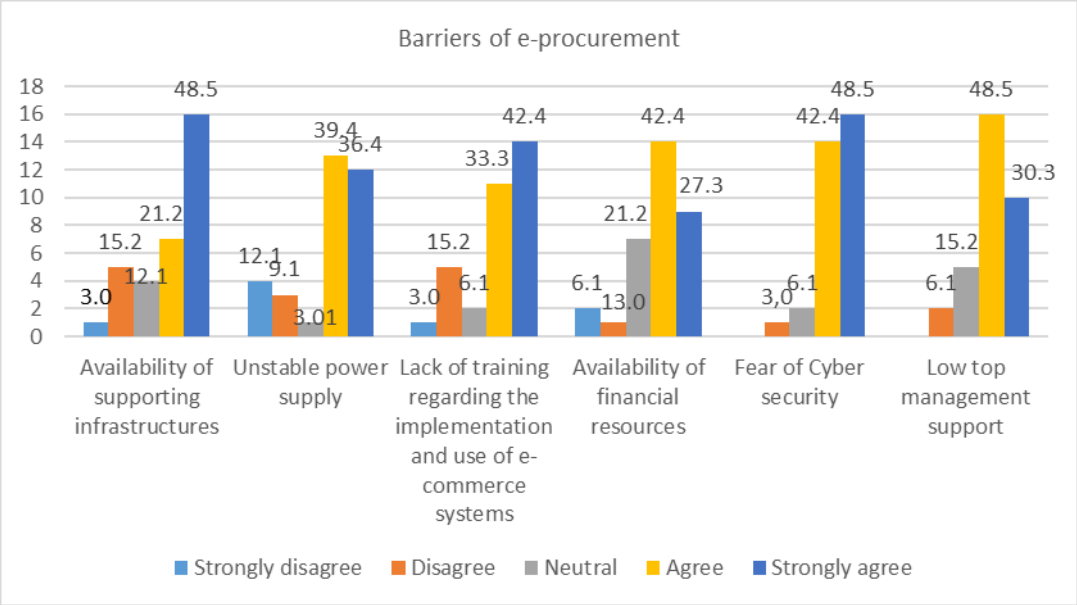


Figure 4. 9: Barriers on the adoption of e-procurement

Figure 4.9 shows that the department of Mpumalanga Treasury lacks the 48.5% (availability of supporting infrastructures), 48.5% (fear of cyber security), 48.5% (lack of management support), 42.4% (lack of training for the use of e-commerce), 42.4% (lack of financial resources), and 39.4% (unstable power supply) playing significant part as it will affect the network. Toktaş-Palut, Baylav, Teoman, and Altunbey, (2014); Anthony (2018) found that lack of supporting infrastructure, lack of leadership support, lack of resources, limited knowledge and skills have a negative impact on the implementation on the adoption of e-procurement.

4.7.4. Benefits on the adoption of e-procurement

Figure 4.10 identified the results of the benefits on the adoption of e-procurement.

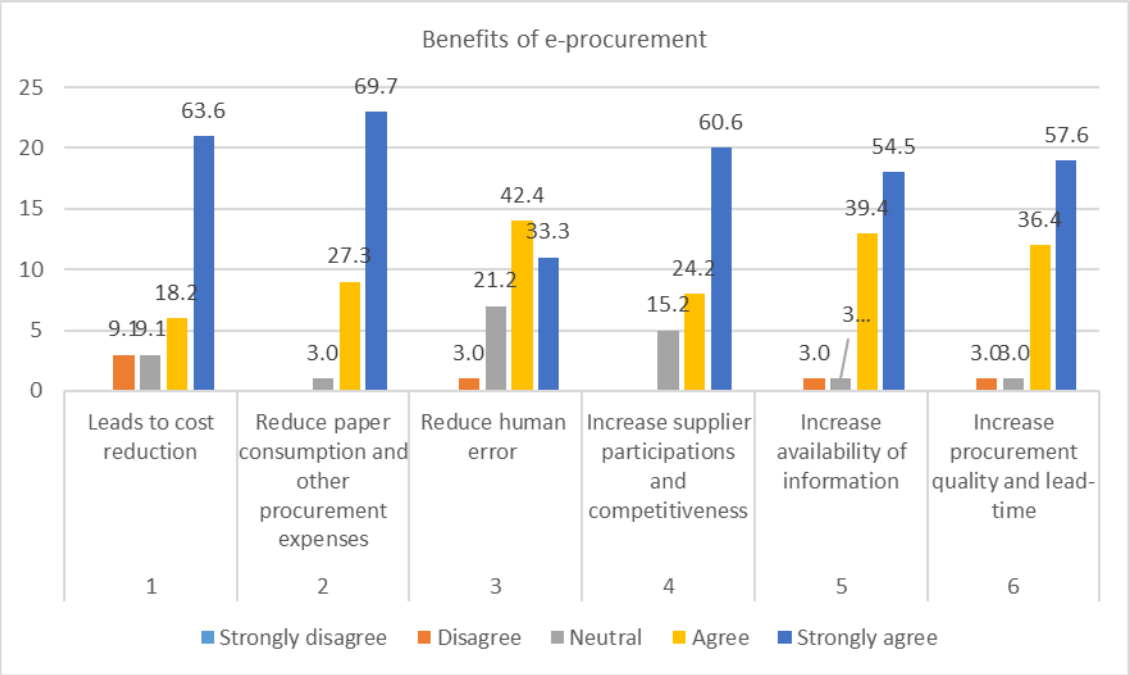


Figure 4. 10: Benefits on the adoption of e-procurement

From Figure 4.10 indicate that, the implementation of e-procurement systems at the department will endure the following benefits including 69.7% (reduced paper consumption and other procurement expenses),63.6% of the (lead to cost reduction),60.6% (increase supplier participation and competitiveness), 57.6%(increased procurement quality and lead time),54.5% (increased availability of information), and (human errors) 42.4%. The participants agree that the adoption of e-procurement will make the department more efficient and effective. These findings are also supported by Toktaş-Palut, Baylav, Teoman, and Altunbey, (2014); Nawi,Roslan, Salleh, Zulhumadi, and Harun (2016) that e-procurement can lead to significant improvements in procurement processes, resulting in reduced costs and increased efficiency. The authors further emphasize that wider integrated information sharing found to be the most significant benefit.

4.8. Chapter summary

This chapter outlined the research findings based on information gathered from the ICT, supply chain, and finance departments of the provincial treasury of Mpumalanga addressing the variables influencing the adoption of e-procurement. Descriptive statistics was used to analyse the data. This was applied to analyse the general information of the employees' constructs, the structure of the organisation procurement processes, and the systems that the organisation uses for procurement processes. Descriptive statistics were also applied to analyse the objectives of the initiated study which included the 5 Likert scale. Furthermore, the analysis of principal components was analysed to check the validity of the questionnaires. Each scale employed in the study adhered to the suggested limit values, which includes the reliability tests carried out and the validity of the component loadings that was independently validated on each data set. Moreover, the results reported in this chapter demonstrate that the empirical objectives have been satisfied. The following chapter discusses the results of the study.

CHAPTER 5

DISCUSSION OF FINDINGS OF THE STUDY

5.1. Introduction

This chapter contains an integrated discussion of key conclusions and suggestions based on significant findings from the chapters addressed in this study. This chapter reflects on the findings derived from the study objectives, the results of the data presented, and the suggested conclusion supported by the literature from the previous chapters.

5.2. Summary and discussion of the key findings in relation to research objectives

This study was premised of the following research objectives:

- To identify the factors affecting the adoption of the e-procurement system in the Mpumalanga Provincial Treasury.
- To determine the perceptions of the employees of the Mpumalanga Provincial Treasury on the adoption of the e-procurement system.
- To determine the barriers and benefits on the adoption of e-procurement in an organisation.

The discussions of the findings as it follows in the next sub-sections are drawn from the empirical objectives.

5.2.1. To identify the factors affecting the adoption of the e-procurement system in the Mpumalanga Provincial Treasury

This first objective was to identify the employee's perceptions towards the adoption of the e-Procurement system. To achieve this empirical objective, the study conducted the 5 Likert scale test to examine the views about the adoption of electronic procurement in the provincial treasury, the findings on both the scale and the descriptive statistics of this objective show that there is a positive association between the perceptions of the participants and the adoption of e-procurement in the Treasury department. Most respondents indicated that if e-procurement was adopted in their department, paperwork would be reduced considerably. In line with these findings, previous scholars such as Innocent and Kalaskar (2016.); More (2016); Rahman, Radzai, Hamdan, and Musa (2019) have found that e-procurement can extensively reduce the use of paperwork in the organisation. Based on that, this study concludes that if the Mpumalanga Provincial Treasury could implement the electronic procurement system, it will

be able to reduce costs related to the purchase of paper that facilitate the procurement processes in the organisation.

Other findings indicate that the adoption of e-procurement by the Treasury would improve the long-term organisational performance, improve turnaround time, and better administrative cost with better effectiveness. Considering these outcomes, the earlier researchers, including Ronald and Omwenga (2015); Muhia and Afande (2015). Supports that the adoption of e-procurement has a positive influence on organisation performance. Therefore, this study concludes that should the treasury department adopt the use of e-procurement, there is a strong predictor that organisational performance, turnaround time, and effectiveness towards the e-procurement system will improve. Therefore, it can be concluded that workers consider e-procurement systems to be beneficial to their jobs. Employees in the public sector's views on using e-procurement technologies are thus influenced by how they view its implementation (Mothibi, 2020).

5.2.2. To determine the perceptions of Mpumalanga Provincial Treasury's employees on the adoption of the e-procurement system

The second objective aimed to determine the factors that affect the adoption of the e-procurement system in the Mpumalanga Provincial Treasury. To achieve this empirical objective, the study conducted the 5 Likert scale test and descriptive statistics to determine the factors in the adoption of e-procurement in an organisation. The results of this objective show that there is a strong influence, as the findings indicate that visibility in supply chain operations is encouraged in many organisations. This is supported by the National Treasury (2015) and other previous scholars such as Kumar and Ganguly (2021); Aldhaheri, and Ahmad (2023); Gulwa (2017). Therefore, the study concludes that organisations that promote supply chain visibility can significantly improve supply chain performance. Additionally, the study findings indicate the availability of IT infrastructures, the elimination of geographical barriers and the need to compete in the marketplace are other factors influencing the adoption of e-procurement. Given these findings, the conclusions are consistent with those of several studies that have shown factors influencing the adoption of e-procurement systems. Such include studies by Ibem *et al.* (2016); Ronald and Omwega (2015) agree that IT infrastructures, geographical barriers, and the ability to compete in the marketplace contribute to the adoption.

5.2.3. To determine the barriers and benefits on the adoption of e-procurement in an organisation

This empirical objective aimed at determining the barriers to the adoption of e-procurement in an organisation. To achieve this empirical objective, the study conducted the 5 Likert scale test and descriptive statistics to identify obstacles to the use of e-procurement. 48.5% of the availability of supporting infrastructures, fear of cyber security, and lack of management support were found to be the predictor of the lack of adoption of e-procurement in the Mpumalanga Provincial Treasury. This was supported by previous researchers such as Laryea and Ibem (2014); Innonnocent and Kalaskar (2016). Thus, the findings of this study suggest that the Mpumalanga Provincial Treasury needs to address these barriers to ensure the successful adoption of e-procurement. This can be achieved by investing in technological infrastructure, providing training and development for staff, as well as implementing effective change management strategies.

The study conducted the 5 Likert scale test and descriptive statistics to identify the benefits of the use of e-procurement in an organisation. The findings showed that there is a strong predictor of benefits by adopting e-procurement, as the respondents believe that the adoption of e-procurement would reduce paper consumption and other procurement expenses. Furthermore, the findings indicate that adopting e-procurement would lead to cost reduction, and increase supplier participation and competitiveness, which are positive benefits of the adoption of e-procurement. These findings suggest that the Mpumalanga Provincial Treasury implements the e-procurement system. The department would have benefits of increased efficiency, cost savings, improved supplier management and better supplier relationships. This is in line with the study by Toktaş-Palut *et al*. (2014), noting that cost reduction, better cooperation, and communication across the supply chain have a significant impact throughout the procurement processes.

5.3. Chapter summary

This chapter has provided a comprehensive examination of the research findings, aligning seamlessly with the intended research objectives. The primary objective of this study was to gauge employee perceptions regarding the implementation of an e-Procurement system. The overall result of the investigation suggests that employees have favourable views on the adoption of such a system. This implies that, should the Mpumalanga Provincial Treasury decide to invest in e-Procurement, employees are likely to welcome this transition. To

effectively execute this adoption, the Treasury must place a strong emphasis on the availability of essential infrastructure, particularly in the realms of Information Technology (IT) and Information and Communication Technology (ICT). Furthermore, the department should consider the appointment of ICT champions to protect against potential cyber threats and hacking attempts, ensuring the security of the electronic procurement system.

The findings of this chapter present a positive outlook on the adoption of an e-Procurement system by the Mpumalanga Provincial Treasury. By focussing on infrastructure, cybersecurity measures, and the critical areas outlined above, the Treasury can position itself for success in the ever-evolving landscape of e-procurement. This proactive approach will not only benefit the provincial government department, but also contribute to improved efficiency, transparency, and competitiveness in its procurement processes.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION OF THE STUDY

6.1. Introduction

This chapter concludes the research. This chapter is crucial to bringing all the components of the research together. The study has explored and analysed various aspects related to the research topic. The chapter serves as the final part of the dissertation, reflecting on the research journey. The chapter begins with a summary of the chapters included in the study, followed by recommendations, limitations, and suggestion for future research possibilities, also included are the concluding remarks.

6.2. Chapter summary of the dissertation

This study's primary goal was to examine the perceived factors affecting the adoption of e-procurement in the Mpumalanga Provincial Treasury. A total of six chapters made up this dissertation, with each fulfilling its role.

Chapter 1: It served as an introductory chapter of the research study. Outlined a brief summary, its importance, and the study's structure. This chapter defined the background, research problem, objectives, and research questions for the whole study. It involves, among other things, the theoretical underpinning, data analysis, and ethical considerations.

Chapter 2: This chapter sets the stage by giving a thorough overview of the study topic and its importance in the modern business settings. It provides the overview of literature focusing on e-procurement as an increasingly significant tool for organisations to restructure their procurement procedures and achieve cost savings, efficiency, and competitive advantage.

Chapter 3: This chapter cover the methodology and design of the research project. It provides comprehensive details regarding the quantitative methodology used in the study. Where it outlined the sampling strategies, data collection instrument and procedures. The study further outlined the data analysis processes and tool used to present data

Chapter 4: This chapter provides a comprehensive overview of the data collection, analysis, and presentation. In order to readily comprehend the results, the data was presented utilising statistical and excel spreadsheet methodologies. The study was interested in presenting the

factors affecting an organisation's adoption of e-procurement. The analysis and presentation followed the relevant study-related questions precisely.

Chapter 5: The topic of this chapter concentrated on the presentation and interpretation of the results for the study. It served as a platform to communicate the outcomes of the research, assessing the findings and results from each research objective while using the relevant supporting data to support the study's outcomes. The chapter begins with addressing each research objective findings and conclusion.

Chapter 6: The chapter serves as a concluding part of the dissertation, reflecting on the research journey. Starts with a summary of the chapters included in the study. Followed by outlined recommendations, limitations, and suggestion for future research possibilities, also included are the concluding remarks.

6.3. Recommendations

The following suggestions are given in light of the research's findings:

- The findings of the study reveal that the Mpumalanga Provincial Treasury is currently using emails, paperwork and telephone as the procurement processes. This indicates that the Mpumalanga Provincial Treasury is yet to adopt a full electronic procurement system in which employees will carry out all procurement activities using a centralised electronic system. It is thus recommended that the Mpumalanga Provincial Treasury adopt centralised e-procurement system that will help the provincial treasury to improve performance in the organisation. Furthermore, the findings of the study show that the provincial treasury have positive perceptions about the adoption of e-procurement. Thus, it can be assumed that employees would embrace the shift from the traditional procurement to e-procurement.
- The Mpumalanga Provincial Treasury needs to encourage the use of technologies among its employees. The department should invest in a durable IT infrastructure that can also help the department protect its sensitive data and information from cyber threats, such as hacking, malware, and phishing attacks. This can help reduce the risk of data breaches and other security incidents that could damage the department's reputation and operations.

- The study findings also revealed that lack of management support is one of the barriers towards the adoption of e-procurement. The study recommends that the top management in the provincial treasury should support the adoption of e-procurement. The literature shows that the commitment from executive level towards the implementation of e-procurement is paramount, as it sets the tone towards the shift in the organisation. Management must inform organisational stakeholders of the justification for adopting the technology and offer end-user training that enables the technology's full exploitation.

6.4. Limitation of the Study

Data for this study were only gathered from a certain section of the Mpumalanga Provincial Treasury. If data from the whole department had been included in this study, the findings could have been more informative. The study had a small sample of (n=33) with probability sampling method and (sample random technique). This made it possible to generalise the results by giving every member of the population an equal opportunity to be picked (Leedy & Ormrod, 2015).

6.5. Suggestions for further studies

The results of the research suggest that, should e-procurement be introduced, there are several options that might improve organisational performance and result in cost savings for the organisation. The study was conducted only in certain sections of the Mpumalanga Provincial Treasury. Therefore, future studies could focus on all the departments of the provincial government to understand the broader view on the variables influencing the adoption of e-procurement**.** Future research on public sector electronic procurement may potentially take a mixed-method approach into consideration. For the purpose of this study, a quantitative technique and a literature review were used to gather data. Including qualitative interview techniques which could enhance the research and include more viewpoints on the deployment of electronic procurement in the public sector.

Regarding the adoption of e-procurement in the Mpumalanga public sector, there are a number of areas that could be further investigated. Here are some suggestions as follows:

- Evaluating the implementation and use of e-procurement in Mpumalanga to that in other South African provinces: The study might contrast Mpumalanga's e-procurement adoption and implementation progress with those of other South African provinces.

This could provide insight into the best practices identified in other provinces on the adoption of an e-procurement system.

- Examining the impact of leadership on the adoption of e-procurement in the public sector: This study may examine the role that leadership plays in the public sector on the adoption of e-procurement. It could also look at the role that leadership can play in helping to manage change when e-procurement is implemented.
- Procurement risk management: conduct research on procurement risk management, to assess the effectiveness of e-procurement in controlling procurement risks in Mpumalanga's public sector, the potential of e-procurement to recognise and reduce risk factors associated with procurement, such as fraud, collusion, and conflict of interest, may be evaluated by this study.
- The effect of e-procurement on supplier relations: This study may look at the effect of e-procurement on supplier relations in Mpumalanga province. It might investigate topics like contract administration, supplier selection, payment procedures and look at how e-procurement affects supplier retention.
- Adoption of e-procurement and organisational culture: This study may look at how organisational culture affects the adoption and use of e-procurement in the Mpumalanga public sector. It might investigate how employees feel and think about e-procurement, as well as the part leadership plays in encouraging its use.

6.6. Conclusion

The use of digital technology is critical in the public sector. E-Procurement is more than just an internet purchasing system. The use of the system would result in substantial advantages, particularly cost savings, and increased productivity, as well as an improvement of the supply chain principles, such as transparency, equity, fairness, competition, and, most importantly, value for money. Infrastructure accessibility, including that of ICT, is something the Treasury could focus on more if it wants to adopt e-procurement effectively. Furthermore, the department should invest in ICT champions to block cyberattacks and hacking. The Mpumalanga Treasury should concentrate its efforts on several key and essential areas, such as enhancing corporate communications, streamlining business processes and reducing costs and cycle times, exploring new markets and business prospects, increasing contract clarity, and overall competitiveness in the implementation of the e-procurement system. Through easy

access to pertinent information about each procurement process, this system will assist the department in making more informed and precise**.** Furthermore, the implementation of the system will reduce the potential duplication of documents. Furthermore, e-procurement is frequently viewed as a solution to inefficiencies and cost overruns in conventional procurement processes since it automates and tracks operations with minimum human interaction.

This study illuminates the perceived factors that influence the adoption of e-procurement in Mpumalanga Provincial Treasury. The findings of the research provide useful information on the challenges and opportunities associated with the implementation of e-procurement systems in public sector organisations. One of the key findings of the study is that perception of organisational readiness plays a decisive role in adopting e-procurement. Participants in the study identified factors such as support from top management, sufficient resources, and qualified personnel as essential to successful implementation. These conclusions highlight the importance of organisational preparation and the need for strategic planning and investment in e-procurement initiatives.

In addition, the study identified the benefits of perceived benefits as another factor that has an influence on the adoption of electronic procurement. Participants recognised benefits such as improved efficiency, cost reduction, increased transparency, and reduced corruption. These advantages are recognised as the driving force behind the adoption of electronic procurement systems and recognise the possibility of simplifying procurement processes and improving results. However, the study also revealed some perceived obstacles and challenges to the adoption of electronic procurement. Participants expressed concern about resistance to changes, lack of technological infrastructure, inadequate training as well as security risks. These results highlighted the importance of dealing with these obstacles to promote a positive adoption environment. Organisations should invest in change management strategies, provide adequate training and support, and implement robust security measures to address these challenges.

Based on these findings, it is clear that the adoption of e-Procurement in the Mpumalanga Provincial Treasury is influenced by a complex interplay of organisational, internal, and external factors. To promote successful adoption, the Treasury should focus on building organisational readiness, addressing perceived barriers, and leveraging perceived benefits. Additionally, collaboration with suppliers and other stakeholders, along with the adherence to legal and regulatory frameworks, will contribute to the effective implementation and

sustainability of e-Procurement systems. It is important to acknowledge the limitations of this study. The study was conducted within a specific context, and the findings may not be generalisable to other organisations or regions. In conclusion, this study has contributed to understanding the factors that influence the adoption of e-Procurement in the Mpumalanga Provincial Treasury. The findings provide valuable information that can inform policy makers, managers and practitioners in their efforts to implement and maximise the benefits of e-procurement systems.

References

Abdi, H., and Williams, L.J., 2010. Principal component analysis. *Wiley interdisciplinary reviews: computational statistics*, 2(4), pp.433-459.

Abdullah, O., 2022. Tracking the evolution of procurement and where it's going next. [online] available at: https://futureofsourcing.com/tracking-the-evolution-of-procurement-and-where-its-going-next (accessed on 07 March 2023).

Accenture., 2021. The future of procurement: Rapidly evolving to remain relevant. [online] available at : *https://www.accenture.com/us-en/insights/consulting/future-procurement* (accessed on 21 April 2023).

Addison, D., 2017. *Implementation and adoption of E-Procurement in Ghana Public Sector: the way forward.* Unpublished thesis (PhD), Kwame Nkrumah University of Science and Technology.

Addo, S.K., 2019. Challenges of E-Procurement Adoption in the Ghana Public Sector: A Survey of in the Ministry of Finance. *Journal DOI*, 1(7), pp.44-80.

Adebayo, V.O., and Evans, R.D., 2015. Adoption of e-procurement systems in developing countries: A Nigerian public sector perspective.*2nd International Conference on Knowledge-Based Engineering and Innovation (KBEI),* pp. 20-25.

Afolabi, A., Ibem, E., Aduwo, E., Tunji-Olayeni, P., and Oluwunmi, O., 2019. Critical success factors (CSFs) for e-Procurement adoption in the Nigerian construction industry. *Buildings*, 9(47).pp.2-18.

Ahmad, T., Aljafari, R., and Venkatesh, V., 2019. The government of Jamaica's electronic procurement system: experiences and lessons learned. *Internet Research*, 29(6), pp. 1571– 1588.

Ajuna, D., 2018. E-procurement and organizational performance a case of Makerere University. Unpublished thesis (Bachelor's degree) Kampala International University.

Aldhaheri, R.T., and Ahmad, S.Z., 2023. Factors affecting organisations' supply chain agility and competitive capability. *Business Process Management Journal*, 29(2), pp.505-527.

All things statistics., 2021. KMO test (for measuring sampling adequacy). [online] available at: *https://allthingsstatistics.com/inferential-statistics/kmo-test/.* (accessed on 02 April 2023).

Altayyar, A., and Beaumont-Kerridge, J., 2016. External factors affecting the adoption of e-procurement in Saudi Arabian's SMEs. *Procedia-Social and Behavioral Sciences*, 229 (2016), pp.363-375.

Ambe, I.M., 2016. Public procurement trends and developments in South Africa. *Research Journal of Business and Management-(RJBM)*, 3(3), pp.277-290

American Educational Research Association., 2018. *Standards for educational and psychological testing*. American Educational Research Association.

Amirrudin, M., Nasution, K., and Supahar, S., 2021. Effect of variability on Cronbach alpha reliability in research practice. *Jurnal Matematika, Statistika dan Komputasi*, 17(2), pp.223-230.

Anthony, A., 2018. The use of e-procurement in South African public procurement law: Challenges and prospects. *Law, Democracy & Development*, 22(1), pp.39-47.

Avedi, E., 2016. *Influence of e-procurement on organizational performance: the case of Kenya association of manufacturers firms in Nairobi County, Kenya*. Unpublished (M.Arts) University of Nairobi.

Babbie, E.R., and Mouton, J., 2010. *The practice of social research*. 10th ed. Cape Town: Republic of South Africa.

Babbie, E.R., 2020. *The practice of social research*. 15th ed. Boulevard Boston: Cengage learning.

Baily, P., Farmer, D., Crocker, B., Jessop, D. and Jones, D., 2015. *Procurement principles and management*.11th ed. Pearson Education.

Banerjee, S., and Weiss, M. A., 2015. The impact of procurement technology on procurement success. *Journal of Purchasing and Supply Management*, 21(4), pp.272-283.

Barahona, J.C., and Elizondo, A.M., 2014. Introducing a disruptive service innovation: A national dilemma in e-procurement. *Management Decision*, 52 (9), pp.1782 – 1800.

Bell, E., Bryman, A., and Harley, B., 2022. *Business research methods*. 6th ed. Oxford university press.

Benzidia, S., and Makaoui, N., 2018. E-procurement implementation and organizational performance. In: Pawar., K.S., Potter., A, Chan. C., and Pujawan, N., eds. *on Logistics (ISL 2018) Big Data Enabled Supply Chain Innovations*, 8-11 May 2018.Bali Indonesia: Big Data Enabled Supply Chain Innovations, pp.28-29.

Bernard, H.R., and Bernard, H.R., 2013. *Social research methods: Qualitative and quantitative approaches*. 2nd ed. Sage.

Bhandari, P., 2022. Distributions and central tendency. [online] at: *https://www.scribbr.com/statistics/central-tendency/.* (accessed on 17 March 2022).

Bhandari, P., 2023. Descriptive Statistics: Definitions, Types, Examples. [online] at: https://www.scribbr.com/statistics/descriptive-statistics/. (accessed on 16 March 2023).

Bhattacherjee, A., 2012. *Social science research: Principles, methods, and practices*. 2nd ed. Gainesville, FL: University of Florida

Bilali, J., and Bwisa, H., 2015. Factors influencing the Adoption of e-Procurement: A case of Garissa County Government. *The Strategic Journal of Business & Change Management*, *35*, pp. 662-682.

Bless, C., Higson-Smith, C., and Sithole, S.L., 2013. *Fundamentals of social research methods: An African perspective*. 5th ed. Juta and Company Ltd.

Bos, J. 2020b. Research ethics step by step. In: Research ethics for students in the social sciences. Springer, Cham, pp. 227-273. [online] at : https://doi.org/10.1007/978-3-030-48415-6_10. (accessed 20 April 2023).

Booker, Q.S., Austin, J.D. and Balasubramanian, B.A., 2021. Survey strategies to increase participant response rates in primary care research studies. *Family Practice*, *38*(5), pp.699-702.

Bromberg, D., and Manoharan, A., 2015. E-procurement implementation in the United States: Understanding progress in local government. *Public Administration Quarterly*, 39(3), pp.360-392.

Brown, T., 2010. Construct validity: A Unitary Concept for Occupational Therapy Assessment and Measurement. *Hong Kong Journal of Occupational Therapy*, 20 (1): 30-42.

Bryant, G., Fred, B., Sattora, C., and Albert, T., 2012. Power analysis and determination of sample size for covariance structure modelling, Psychological Methods, 1(2):130-49.

Bryman, A., 2016. *Social research methods*. 2nd ed. Oxford: Oxford University Press.

Buckley, P. J., and Ghauri, P. N., 2015. *The internationalization of business: A strategic guide to global marketing*. 1st ed. Routledge.

Bulut, C., and Yen, B.P., 2013. E-procurement in public sector: a global overview. *Electronic Government, an International Journal*, 10(2), pp.189-210.

Calzo, B., 2022. The ultimate guide to modern data quality management for an effective data quality control driven by the right metrics. [online] at: https://www.datapine.com/blog/data-quality-management-and-metrics/ (accessed on 28 February 2023).

Carpentier, A., and Munos, R., 2014. Minimax number of strata for online stratified sampling: The case of noisy samples. *Theoretical Computer Science*, *558*, pp.77-106.

Chaffey, D., and Ellis-Chadwick, F., 2019. *Digital marketing: strategy, implementation & practice*. 7th ed. Pearson UK.

Chakrabartty, S.N., 2013. Best Split-Half and Maximum Reliability. *Journal of Research & Methods in Education*, 3(1),pp1-8.

Chan, A.P., and Owusu, E.K., 2022. Evolution of electronic procurement: contemporary review of adoption and implementation strategies. *Buildings*, 12(2), p.198.

Chebet, J., and Kihara, A., 2022. Influence of e-procurement on procurement performance in manufacturing firms in Nairobi County. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, *6*(1), pp. 104-114.

Chegugu, N.R., and Yusuf, K.G., 2017. Effect of electronic procurement practices on organizational performance in public hospitals in the county government of Uasin Gishu, Kenya. *International Academic Journal of Procurement and Supply Chain Management*, 2(3), pp.16-32.

Chen, H., and Guo, Y., 2015. An empirical study of the factors affecting e-procurement adoption in China. *Journal of Electronic Commerce Research,* 16(4), 300–314.

Chen, Y., Bretschneider, S., Stritch, J.M., Darnall, N., and Hsueh, L., 2022. E-procurement system adoption in local governments: the role of procurement complexity and organizational structure. *Public Management Review*, *24*(6), pp.903-925.

Chirchir, E.K., Ngeno, V., and Chapkwony, J., 2015. Relationship between e-procurement adoption & supply chain management practices in tea firms. *International Journal of Managerial Studies & Research*, 3(2), pp.25-36.

Chong, A.Y.L., 2013. Predicting m-commerce adoption determinants: A neural network approach. *Expert systems with applications*, *40*(2), pp.523-530.

Chopra, S., and Meindl, P., 2016. *Supply Chain Management: Strategy, Planning, and Operations (Global Edition)*, 6th ed. Harlow, England: Pearson.

Clardi, M., 2021. What Is a Response Rate? (online) at: *https://resources.clearvoice.com/blog/what-is-a-response-rate/* (accessed on 04 April 2023).

Cook, T.D., Campbell, D.T., and Shadish, W., 2002. Experimental and quasi-experimental designs for generalized causal inference. Boston, MA: Houghton Mifflin. pp.103-134.

Corsi, M., 2006. E-procurement overview. Università "La Sapienza" di Roma, pp.1-9.

Cote, C., 2021. 7 Data collection methods in business analytics. [online] at: *https://online.hbs.edu/blog/post/data-collection-methods* . (accessed on 14 March 2023).

Creswell, J. W., 2009. *Research design: Qualitative, quantitative, and mixed-methods approaches*. 3rd ed. Thousand Oaks, CA: Sage Publications, Inc.

Creswell, J. W., 2014. *Research design: Qualitative, quantitative, and mixed-methods*.4th ed. Sage publications.

Creswell, J.W., and Creswell, J.D., 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. 3rd ed. Sage publications.

Daniels, J. D., Radebaugh, L. H., and Sullivan, D. P., 2018. *International business: Environments and operations*. 6th ed. Pearson.

Daoud, L., and Ibrahim, M., 2018.The factors affecting on e-procurement usage: The moderating role of power. *In Journal of Physics: Conference Series,*1019,(1), p. 012076.

DataSpring., 2017. Understanding Survey Response Rates for Better Market Research Insights. (online) at: *https://www.d8aspring.com/blog/understanding-survey-response-rates-for-better-market-research-insights* (accessed on 04 April 2023).

Davila, A., Gupta, M., and Palmer, R., 2003. Moving procurement systems to the internet: The adoption and use of e-procurement technology models. *European management journal*, 21(1), pp.11-23.

Dikko, M., 2016. Establishing construct validity and reliability: Pilot testing of a qualitative interview for research in Takaful (Islamic insurance). *The qualitative report*, 21(3), pp.521-529.

Doherty, N.F., McConnell, D., and Ellis-Chadwick, F., 2013. Institutional responses to electronic procurement in the public sector. *International Journal of Public Sector Management,* 26(6) pp. 495–515.

Du Plooy-Cilliera, F., Davis, C., and Bezuidenhout, R., 2014. Research matters. Cape Town: Juta. Durai. *Human Resource Management*, p.2010.

.

Duma, P.S., 2018. *The adoption of the e-procurement system by the eThekwini Municipality for SMME owners: the views of Small Medium and Micro Enterprise (SMME) owners.* Unpublished (PhD) University of Kwa-Zulu Natal.

Engel, R.J., and Schutt, R.K., 2013. *The practice of research in social work*. 4th ed. Los Angeles: Sage Publications.

Fabiola, B., and Ignasi, B., 2012. A virtual snowball sampling method using Facebook. *An International Journal*, 22(1),pp.232-241.

Fang, F., and Natarajan, H.P., 2020. Sourcing and Procurement Cost Allocation in Multi-division firms. *Production and operations management*, 29(3), pp.767-787.

Frambach, R. T., and Vlachos, P. A., 2016. The adoption of e-procurement in supply chains: An empirical analysis. *International Journal of Operations & Production Management*, 36(10), pp.1142-1166.

Francios, C., 2022. What is a Procurement System? [online] available at: https://www.smartcapitalmind.com/what-is-a-procurement-system.htm (accessed on 09 November 2022).

Friedman, A., 2019. The benefits of employee training and development. Forbes. [online] available at: https://www.forbes.com/sites/amyanderson/2019/02/17/the-benefits-of-employee-training-and-development/?sh=2f94c2721b9d (accessed on 21 April 2023).

Gardenal, F., 2013. A model to measure e-procurement impacts on organizational performance. *Journal of public procurement*, 13(2), pp.217-242.

Glesne, C., *Becoming qualitative researchers: An introduction*. 4th ed. Boston: Pearson Education.

Goforth, C., 2015. Using and Interpreting Cronbach's Alpha. [online] at: https://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/. (accessed on 15 March 2023).

Gulwa, P., 2017. E-procurement an international perspective. [online] available at: https://www.smartprocurement.co.za/review/2017/02/e-procurement-

aninternationalrocurement-an-international-perspective.html. (accessed on 21 November 2022).

Gunasekaran, A., and Ngai, E.W., 2008. Adoption of e-procurement in Hong Kong: an empirical research. *International Journal of Production Economics*, 113(1), pp.159-175.

Gunasekaran, A., McGaughey, R.E., Ngai, E.W., and Rai, B.K., 2009. E-Procurement adoption in the Southcoast SMEs. *International Journal of Production Economics*, 122(1), pp.161-175.

Hatice, C., and Mehmet, S., 2012. E-Procurement: A Case Study about the Health Sector in Turkey. *International Journal of Business and Social Science*, 3(7), pp.234-265.

Hayes, A., Brock, T., and Logan, M., 2022. Descriptive statistics: definition, overview, types, example. [online] at: https://www.investopedia.com/terms/d/descriptive_statistics.asp. (accessed on 17 March 2023).

Heikkilä, J., Hallikas, J., and Saarela, M., 2017. The impact of e-procurement on the purchasing process: A literature review. *Journal of Purchasing and Supply Management,* 23(4),pp. 222-232.

Huang, S., and Li, X., 2014. Factors influencing e-procurement adoption in Chinese small- and medium-sized enterprises. *Journal of Purchasing and Supply Management,* 20(2), pp.104-111.

Hugos, M.H., 2018. *Essentials of supply chain management*. 4th ed. Hoboken, New Jersey: John Wiley & Sons.

Hung, W. H., Lin, C. P., Tai, Y. M., Ho, C. F., and Jou, J. J., 2014. Exploring the impact of Webbased e-procurement on performance: organisational, interorganisational, and systems perspectives. *International Journal of Logistics Research and Applications*, 17(3), pp.200-215.

Ibem, E.O., and Laryea, S., 2015. E-Procurement use in the South African construction industry. *Journal of Information Technology in Construction,* 20 (23), pp.364-384.

Ibem, E.O., Aduwo, E.B., Afolabi, A.O., Oluwunmi, A.O., Tunji-Olayeni, P.F., Ayo-Vaughan, E.A., and Uwakonye, U.O., 2021. Electronic (e-) procurement adoption and users' experience in the Nigerian construction sector. *International Journal of Construction Education and Research*, 17(3), pp.258-276.

Ibem, E.O., Aduwo, E.B., Tunji-Olayeni, P., Ayo-Vaughan, E.A., and Uwakonye, U.O., 2016. Factors influencing e-Procurement adoption in the Nigerian building industry. *Construction Economics and Building*, 16(4), pp.54-67.

Ilhan, N., and Rahim, M.M., 2013. Understanding e-procurement systems benefits: A theoretical model with initial findings from an Australian Local Council. In *Proceedings of the 24th Australasian Conference on Information Systems (ACIS),* pp. 4-6.

Innocent, R., and Kalaskar, P.B., 2016. The Adoption of e-Procurement and its impact on the Procurement Performance of Selected Telecommunication Companies in Rwanda. *European Journal of Business and Management*, 8(15), pp.125-133.

Iquantum., 2022 .How Strategic Procurement Can Give You a Competitive Advantage. [online] available at: https://www.iquantum.ai/blog/strategic-procurement-can-give-competitive-advantage/. (accessed on 26 February 2023)

Israel, D., and Curkovic, S., 2020. Indirect Procurement: A Literature Review and Study of Trends. *American Journal of Industrial and Business Management*, *10*(04), pp.775.

Issabayeva, S., Yesseniyazova, B., and Grega, M., 2019. Electronic Public Procurement: Process and Cybersecurity Issues. NISPAcee. *Journal of Public Administration and Policy*, 12(2), pp.61-79.

Jaadi. Z., 2022. A Step-by-Step Explanation of Principal Component Analysis (PCA). [online] at: https://builtin.com/data-science/step-step-explanation-principal-component-analysis (accessed on 17 March 2023).

Jafari, M., and Fakhrzad, M. B., 2015. The impact of e-procurement on supply chain management: a case study of Pars Oil and Gas Company. *Journal of Applied Environmental and Biological Sciences,* 5(2),pp.103-109.

Jolliffe, I. T., 2002. Principal component analysis. 2nd ed. New York: Springer.

Kabanda, S., Pitso, N., and Kapepo, M., 2019. The Role of Institutional Pressures in the Adoption of e-Procurement in Public Institutions in Developing Countries: The Case of Lesotho. *The African Journal of Information Systems*, 11(3), pp. 232-248.

Kachingwe, L.K., 2013. *Action Strategies for Enhancing the Implementation of Performance Improvement Initiatives Within the Health Sector in Botswana.* Unpublished (PhD). University of KwaZulu-Natal.

Kamotho, D.K., 2014. *E-Procurement and procurement performance among state corporations in Kenya*. Unpublished thesis (PhD). University of Nairobi.

Keeble, G., 2016. Data quality control. [online] at:http://uis.unesco.org/sites/default/files/documents/6._nadi 2016_data_quality_control.pdf (accessed on 28 February 2023).

Kelly, K., 2023. What is Data Analysis? Methods, Process and Types Explained. [online] at:https://www.simplilearn.com/data-analysis-methods-process-types-article (accessed on 15 March 2023).

King'ori, M.W., 2013. *The effect of e-procurement on supply chain management at teachers' service commission*. Unpublished thesis (PhD).University of Nairobi.

Kituzi, A.E., 2016. *Influence of e-procurement on organizational performance: The case of Kenya association of manufacturers firms in Nairobi County, Kenya*. Unpublished thesis (M.Arts) University Of Nairobi.

Kiwekete, A.K., and Doorgapersad, S.V., 2017. Gender Based E-Procurement within the City of Johannesburg Metropolitan Municipality. *International Journal of eBusiness and eGovernment Studies*, 9(1), pp.9-23.

Kumar, N., and Ganguly, K.K., 2021. External diffusion of B2B e-procurement and firm financial performance: Role of information transparency and supply chain coordination. *Journal of Enterprise Information Management*, 34(4), pp.1037-1060.

Kumar, R., 2011. Research methodology: a step-by-step guide for beginners. 3rd ed. Los Angeles: SAGE.

Kumar, R., 2019. Research methodology: a step-by-step guide for beginners. 5th ed. London: SAGE.

Kumar, S., and Suresh, N., 2017. E-procurement: a review of emerging research issues. *Journal of Advances in Management Research,* 14(1),pp. 4-16.

Kumar, V., and Singh, D., 2018. Adoption of e-procurement for supply chain performance: An empirical study. *International Journal of Procurement Management,* 11(3), pp.283-306.

Kusek, J. Z., and Rist, R. C., 2018. *Ten steps to a results-based monitoring and evaluation system: A handbook for development practitioners*.1st ed. World Bank Publications.

Laryea, S., Ibem, E. O., Pagiwa, R., and Phoi, R., 2014. Electronic procurement in the South African construction sector: case study of government departments in the Gauteng Province. In Proceedings of the DII-2014 Conference on Infrastructure Investments in Africa. 25-26 September 2014 Livingstone, Zambia.

Leedy, P.D., and Ormrod, J.E., 2013. *Practical research: planning and design*. 10th ed. San Francisco: Pearson.

Leedy, P.D., and Ormrod, J.E., 2019. *Practical Research: Planning and Design*. 12th ed. San Francisco: Pearson.

Lutfi, A. A., Idris, K., and Mohamad, R., 2016. The influence of technological, organizational and environmental factors on accounting information system usage among Jordanian small and medium-sized enterprises. *International Journal of Economics and Financial Issues*, 6(7), pp. 240–248.

Luyirika, M.N., 2010. *The role of microfinance in the socio-economic development of women in a community: a case study of Mpigi town council in Uganda.* Unpublished thesis (MA).University of South Africa.

Madzimure, J., 2018. *E-Procurement, supplier integration and supply chain performance in small and medium enterprises in Gauteng Province.* Unpublished thesis (PhD) Vaal University of Technology.

Mafini, C., Dhurup, M., and Madzimure, J., 2020. E-procurement, supplier integration and supply chain performance in small and medium enterprises in South Africa. *South African Journal of Business Management*, 51(1), pp.1-12.

Mahdillou, H., and Akbary, J., 2014. E-procurement adoption, its benefits and costs Unpublished thesis (Bachelor Science) University of Boras, [online] available at : https://www.diva-portal.org/smash/get/diva2:1310114/FULLTEXT01.pdf (accessed on 13 October 2022).

Mamafha, T.M.M., Ngulube, P., and Ndwandwe, S.C., 2014. Utilization of information and communication technologies in public libraries at Ekurhuleni Metropolitan Municipality in South Africa. *Information Development*, 32(3),pp.313-326.

Maree, K., 2007. *First steps in research*. 1st ed. Pretoria: Van Schaik.

Marei, A., 2022. The effect of e-procurement on financial performance: Moderating the role of competitive pressure. *Uncertain Supply Chain Management*, 10(3), pp.855-866.

Masudin, I., Aprilia, G.D., Nugraha, A., and Restuputri, D.P., 2021. Impact of E-procurement adoption on company performance: Evidence from Indonesian manufacturing industry. *Logistics*, *5*(1), p.16.

Maxfield, M.G., and Babbie, E.R., 2014. *Research methods for criminal justice and criminology.* 7th ed. Stanford: Cengage Learning.

Maxwell, J.A., 2013. *Qualitative research design: An interactive approach (applied social research methods)*.3rd ed. Thousand Oaks, CA: Sage.

Mayer, I., 2015. Qualitative research with a focus on qualitative data analysis. *International Journal of Sales, Retailing & Marketing*, 4(9), pp.53-67.

Mbanje, S., and Lunga, J., 2015. *Fundamental principles of supply chain management*. Van Schaik Publishers.

McGuirk, P.M., and O'Neill, P., 2016. Using questionnaires in qualitative human geography. *In*: Hay, I. *Eds. Qualitative Research Methods in Human Geography*. Don Mills, Canada: Oxford University Press, pp. 147-162.

Mcleod, S., 2014. Questionnaires. Simply psychology. [Online] at: https://www.simplypsychology.org/questionnaires.html (accessed on 20 March 2023).

Mgidlana, L.M., 2013. *Factors affecting the adoption of e-procurement technologies from the supplier perspective.* Unpublished thesis (MBA). University of Pretoria.

Monczka, R.M., Handfield, R.B., Giunipero, L.C., and Patterson, J.L., 2015. 6th ed. *Purchasing and Supply Chain Management*. Cengage Learning.

More, M., 2016. Small businesses to benefit from Central Supplier Database. [online] available at: https://www.sanews.gov.za/south-africa/smallbusinesses-benefit-central-supplier-database: (accessed on 13 November 2022).

Mose, J. M., Njihia, J. M., and Peterson, O. M., 2013. The critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya, *European Scientific Journal,* 9(3), pp. 375–401.

Mothibi, G.M., 2020. *A framework for the implementation of e-procurement practices in the South African public sector*. Unpublished thesis (PhD). Vaal University of Technology.

Mpehle, Z., and Mudogwa, R.M., 2020. Utilisation of digital central supplier database in enabling electronic procurement in the Limpopo provincial departments. *Africa's Public Service Delivery and Performance Review*, 8(1), pp.1-10.

Muhia, D.W., and Afande, F.O., 2015. Adoption of e-procurement strategy and procurement performance in state corporations in Kenya (A case of Kenya Revenue Authority). *Industrial Engineering Letters*, 5(6), pp.1-24.

Mulili, B.M., 2011. *Towards the best corporate governance practices model for public universities in developing countries: the case of Kenya.* Unpublished (PhD), Southern Cross University.

Munzhedzi, P.H., 2016. South African public sector procurement and corruption: Inseparable twins? *Journal of Transport and Supply Chain Management*, 10(1), pp.1-8.

Muriithi, M.P., and Senelwa, A.W., 2018 Factors influencing adoption of e-procurement in humanitarian organisations in Kenya: A case of Norwegian refugee council- Kakuma refugee camp. *International Journal of Recent Research in Social Sciences and Humanities*,(5) 4, pp.248-264.

Mushi, G.O., and Nsimbila, P.M., 2022. Determinants of Electronic Procurement System Adoption in Tanzania. *African Journal of Applied Research*, *8*(1), pp.309-323.

Mutangili, S.K., 2014. An assessment of the adoption of e-procurement application systems on supply chain management environment in Kenya: A case of Zain Kenya Limited. *International Academic Journals,* 1(1), pp.38-61.

Muthoka, C.N., 2016. *E-procurement and performance of government ministries in Kenya*. Unpublished thesis (PhD).University of Nairobi.

Mwita, P., Mwaighacho, S., and Azanlerigu, J.A., 2017. Effect of e-procurement on procurement performance in Kenya ports authority. *Imperial journal of interdisciplinary research*, *5*, pp.624-636.

Myataza, N.M., 2015. *An Assessment of E-procurement in the Eastern Cape Provincial Government.* Unpublished thesis (PhD). University of Fort Hare.

National Treasury., 2015. Central Supplier Database (CSD) - Frequently Asked Questions. [online]at:https://www.treasury.gov.za/comm_media/press/2015/FAQ_CSD_2015_06_23.pdf (accessed on 23 April 2023).

National Treasury.,2021. Office of the Chief Procurement Officer. [online] at: https://www.treasury.gov.za/ocpo/. (accessed on 23 April 2023).

Nawi, M. N. M., Deraman, R., Bamgbade, J. A., Zulhumadi, F., and Riazi, S. R. M., 2017. E-procurement in Malaysian construction industry: Benefits and challenges in

implementation. *International Journal of Supply Chain Management*, 6(1),pp. 209–213.

Nawi, M.N.M., Roslan, S., Salleh, N.A., Zulhumadi, F., and Harun, A.N., 2016. The benefits and challenges of E-procurement implementation: a case study of Malaysian company. *International Journal of Economics and Financial Issues*, 6(7), pp.329-332.

Neuman, W.L., 2014. *Social research methods: qualitative and quantitative approaches.* 8th ed. New Jersey: Pearson.

Njualem, L., and Smith, M., 2018. Exploring the effects of enterprise resource planning systems on direct procurement: an upstream asset-intensive industry perspective. *International journal of supply and operations management*, *5*(4), pp.396-402.

Oppong, W.A., 2020. Electronic Procurement and Organizational Performance Among Commercial State Corporations. *Project Management Scientific Journal*, 4(3): 26-43.

Osei-Tutu, E., Kissi, E., Osei-Tutu, S., and Desmond, A., 2019. Evaluating critical factors for the implementation of e-procurement in Ghana. *Int. J. Procurement Management,* 12(1),pp.1-12.

Oteki, E.B., 2019. *Influence of Electronic Procurement Practices on Supply Chain Performance of Sugar Processing Firms in Kenya*. Unpublished thesis (PhD). eJomo Kenyatta University of Agriculture and Technology.

Pallant, J., 2016. *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. 6th ed. McGraw-Hill education (UK).

Pennington, D., 2018. *Essential Personality*. 2nd ed. New York: Routledge.

Pickard, A.J., 2013. *Research Methods in Information.* 2nd Ed. London: Facet Publishing.

Procurement Software Blogs., 2019. Traditional vs e-procurement: how technology has helped transform the procurement function.[online] available at: https://www.gep.com/blog/technology/traditional-procurement-vs-e-procurement: (accessed on 23 February 2023).

Rahman, S.S.A., Radzai, M.M., Hamdan, N.S., and Musa, H., 2019. A review: adoption implementation of e-procurement in organization. *International Journal of Human and Technology Interaction (IJHaTI)*, 3(2), pp.11-16.

Ramanathan, U., and Gunasekaran, A., 2014. Supply chain collaboration: Impact of success in long-term partnerships. *International Journal of Production Economics*, 1(147), pp.252-259.

Razali, M. R., and Aqlan, F., 2015. The determinants of e-procurement adoption in Malaysian manufacturing industry: A proposed framework. *Journal of Engineering and Technology*, 6(1),pp.1-10.

Ronald, N.K., and Omwenga, J.Q., 2015. Factors contributing to adoption of e-procurement in county governments: a case study of County Government of Bomet. *International Journal of Academic Research in Business and Social Sciences*, *5*(10), pp.233-239.

Rossell, Y., 2012. Principles and practice in reporting statistical equation analyses. *Psychological Methods,* 7 (1), pp.64-82.

Rubin, A., and Babbie, E., 2016. *Research methods for social work*. 7th ed. Belmont, CA: Brooks/Cole.

Rüdiger, H.M., 2015.The Increasing Importance of the Procurement and Supply Chain Management Function. (online) available at: https://www.munich-business-school.de/insights/en/2015/supply-chain-management-2/: (accessed on 23 February 2023)

Rukuni, T.F., Maziriri, E.T., and Mulaudzi, H., 2020. Assessing electronic procurement at a state-owned enterprise in South Africa. *Journal of Contemporary Management*, 17(2), pp.393-415.

Salkind, N.J., 2012. *Exploring Research*. 8th ed. New York: Pearson.

Samoei, A.K., and Ndede, F., 2018. Adoption of e-procurement and financial performance of ministry of education, science and technology, Kenya. *International Academic Journal of Economics and Finance*, *3*(2), pp.385-409.

Sani, L.I., 2013. Data collection techniques a guide for researchers in humanities and education. *International Research Journal of Computer Science and Information Systems, 2*(3),pp.40-44.

Schaafsma, A.H., and Schrakamp, J.W., 1985. Egyptian Lessons for Materials Management and Purchasing. IEEE Engineering Management Review, 2(13), pp.11-15.

Schoenherr, T., 2023. What is Procurement Management? [online] at: https://www.michiganstateuniversityonline.com/resources/supply-chain/what-is-procurementmanagement/#:~:text=Procurement%20management%20is%20responsible%20for,needed%20for%20efficient%20business%20operations. (accessed on 19 April 2023).

Seidman, I., 2014. *Interviewing as qualitative research: a guide for researchers in education.* 4th ed. New York: Teachers College Press.

Serdarasan, S., 2013. A review of supply chain complexity drivers. Computers & Industrial Engineering, 66(3), pp.533-540.

Shafiee, M., Karim, A., and Moghaddam, M., 2018. The impact of e-procurement on procurement practices and performance: A case study of selected Iranian organizations. *Journal of Business and Retail Management Research,* 12(3), 27-35.

Shields, P., and Nandhini, R., 2013. *A playbook for research methods: integrating conceptual frameworks and project management*. Stillwater, OK: New Forums Press.

Sileyew, K. J., 2019. Research design and methodology. In E. Abu- Taieh, A. El Mouatasim. pp.1-12.

Simplilearn., 2023. What is data collection: methods, types, tools, and techniques. [online] at: https://www.simplilearn.com/what-is-data-collection-article. (accessed on 14 March 2023).

Society for Human Resource Management., 2019. The bottom line: corporate performance and women's representation on boards. [online] at: https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/Documents/SHRM%20Board%20Diversity%20Report%202019.pdf (accessed on 21 April 2023).

Solanki, K., 2022. Research design: Definition, features, types, process, importance and factors affecting research design. [online] at: https://www.toppers4u.com/2022/01/research-design-definition-features.html. (accessed on 21 March 2022).

Stevens, J. P. 2009. Applied multivariate statistics for the social sciences. 5th ed. New York. Routledge.

Suleiman, M.A., 2013. *Adoption of e-procurement and value addition to Tanzanian public institutions: a case of Tanzania public institutions.* Unpublished thesis (PhD). Mzumbe University

Tassabehji, R., and Moorhouse, A., 2008. The changing role of procurement: Developing professional effectiveness. *Journal of purchasing and supply management*, 14(1), pp.55-68.

Tatsis, V., Mena, C., Van Wassenhove, L.N., and Whicker, L., 2006. E-procurement in the Greek food and drink industry: drivers and impediments. *Journal of Purchasing and Supply management*, 12(2), pp.63-74.

Taylor, S., 2023. Central tendency: A descriptive summary of a dataset through a single value that reflects the center of the data distribution. [online] at: *https://corporatefinanceinstitute.com/resources/data-science/central-tendency/*. (accessed on the 17 March 2023).

Toktaş-Palut, P., Baylav, E., Teoman, S., and Altunbey, M., 2014. The impact of barriers and benefits of e-procurement on its adoption decision: An empirical analysis. *International Journal of Production Economics*, 1(158), pp.77-90.

Tran, Q., and Huang, D., 2014. E-procurement institutionalization in construction industry in developing countries: A model and instrument. *WSEAS Transactions on Computers*, 13(7), pp.152-176.

Tshilo, M., and Joyce, A., 2020. *The Development Of A Framework For The Management Of Suppliers As Part Of Public Procurement Management And Supply Chaim Management Practices In District Municipalities Of The Free State Province.* Unpublished thesis (PhD).Central University of Technology.

Tsuma, V.I., and Kanda, M., 2017. Factors Affecting the Adoption of e-Procurement Systems among International Non-Governmental Organisations in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(2), pp.164-176.

Turney, S., 2022. Frequency distribution. Tables, types and examples. [online] at: *https://www.scribbr.com/statistics/frequency-distributions/.* (accessed on 17 March 2023).

Tutu, S.O., Kissi, E., Osei-Tutu, E., and Desmond, A., 2019. Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, 12(1), pp.1-14.

Uddin, M., 2015. *Prospects and challenges of e-procurement in government purchases: a study on e-procurement in LGED, Narayanganj District*. Unpublished thesis (Masters) Brac university, Dhaka.

Usifoh, D., 2018. The Evolution of Procurement. Gateway Procurement 1. [online] available at: https://www.gatewayprocurement.co.uk/insights/the-evolution-of-procurement/ (Accessed on 17 March 2023)

Varadharajan, D., 2020. The evolution of procurement: Where it was and where it is going. [online] available at https://www.spiceworks.com/supplychain/procurement/guest-article/the-evolution-of-procurement-where-it-was-and-where-it-is-going/: (accessed on the 20 February 2023)

Vogler, S., Habimana, K., and Haasis, M.A., 2022. Purchasing medicines for the public sector: Evaluation of the performance of centralised procurement in Portugal. *The International journal of health planning and management*, 37(4), pp.2007-2031.

Waithaka, R.K., and Kimani, J.G., 2021. Effect of E-Procurement Practices on Supply Chain Performance. *Global Journal of Purchasing and Procurement Management*, 1(1), pp.32-42.

Watt, A., 2014. *Project management*. 2nd ed. Campus.

Welman J.C., Kruger S.J., Mitchell B., 2010. *Research Methodology*. Oxford University Press Southern Africa.

Welman, C., Kruger, F., and Mitchell, B., 2010. *Research methodology*. 8th ed. Oxford University Press.

World Bank., 2017. Procurement Reform: A Framework for Collaboration and Harmonization. [online] available at: https://openknowledge.worldbank.org/handle/10986/26439 (accessed on 21 April 2023).

Wu, F., Zsidisin, G., and Ross, A., 2007. Antecedents and outcomes of e-procurement adoption: an integrative model. *IEEE Transactions on Engineering Management*, 54(3), pp.576-587.

Wynstra, F., Rooks, G., and Snijders, C., 2018. How is service procurement different from goods procurement? Exploring ex ante costs and ex post problems in IT procurement. *Journal of purchasing and supply management*, 24(2), pp.83-94.

Yin, R. K., 2018. *Case study research and applications: Design and methods*. 6th ed. Thousand Oaks, CA: Sage.

Yong, A.G., and Pearce, S., 2013. A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in quantitative methods for psychology*, 9(2), pp.79-94.

Young, J., James, M., and Munichiello, K., 2023. What Is Procurement? [online] available at: *https://www.investopedia.com/terms/p/procurement.asp:* (accessed on 19 April 2023).

Zohrabi, M., 2013. Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and practice in language studies*, 3(2), p.254

.

Zou, P.X.W., Sunindijo, R.Y., and Dainty, A.R.J., 2014. A mixed methods research design for bridging the gap between research and practice in construction safety. *Safety Science*, 1,(70),pp.16-326.

APPENDIX A: INFORMED CONCENT FORM

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL
For research with human participants

Information Sheet and Consent to Participate in Research

Date: 16 November 2022

I can be contacted at: Email: 222128723@stu.ukzn.ac.za or nchabelengs@yahoo.com
Cell: (0785073037)
My supervisor is Dr Eric D. Ncube who is School of Management, IT and Government within the College of Law and Management. Contact details: Email: ncubee@ukzn.ac.za; Phone number: (0312608805)

Greetings,

My name is Lewane Success Nchabeleng, a postgraduate student at the University of Kwa-ZuluNatal. This study project forms part of my master's degree of Supply Chain Management at the School of Management, IT, and Government within the College of Law and Management. I am engaging in a Research project, titled: ***Perceived factors affecting the adoption of E-procurement in the Mpumalanga provincial treasury***. This study attempts to look into the perceived factors, benefits, and barriers, influencing the adoption of e-procurement.

You are invited to participate in this empirical study which is quantitative in nature. The aim and purpose of this research are to identify the factors that affect the adoption of e-procurement at the Mpumalanga provincial treasury. The study is expected to include 35 staff members from ICT, finance, and supply chain. The information provided by the participants will be used for scholarly research only. Your participation is voluntary. This means that one can choose to take part in the study or decline participation. You are at liberty to withdraw your participation should you feel uncomfortable in any way. The participant's views in this questionnaire will be presented anonymously, and neither the participant's name nor identity will be disclosed in any form in the study. The study will follow the principle of confidentiality and respect throughout. The questionnaire will take you about 5 to 10 minutes to complete. If you agree to participate, please sign the declaration attached to this statement **(a separate sheet will be provided for signatures**)

This study will provide no benefit to participants, the study hopes to identify the factors that affect the adoption of e-procurement in the Mpumalanga provincial treasury. The study will assist the treasury with the advantages of adopting e-procurement. The researcher will self-administer the questionnaire.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number_____).

In the event of any problems or concerns/questions, you may contact the researcher at (Email: 222128723@stu.ukzn.ac.za or nchabelengs@yahoo.com
Cell: 0785073037) or the UKZN Humanities & Social Sciences.
Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

Thank you for your contribution to this research.

Sincerely,

Lewane S. Nchabeleng

CONSENT TO PARTICIPATE

I …….. have been informed about the study entitled perceived factors affecting the adoption of e-procurement in the Mpumalanga provincial treasury, by Lewane S. Nchabeleng

I understand the purpose and procedures of the study.

I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time.

If I have any further questions/concerns or queries related to the study, I understand that I may contact the researcher at email: 222128723@stu.ukzn.ac.za or nchabelengs@yahoo.com
Cell: 0785073037

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000

KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness **Date**
(Where applicable)

_____ _____
Signature of Translator **Date**
(Where applicable)

APPENDIX B: QUESTIONNAIRE

Section A: General information of the respondent
Kindly respond to the question by crossing [x] in the appropriate box provided for each question and briefly write where required.

1. Professional background of the respondent:

   Supply chain/procurement officer [ ]

   Accounting [ ]

   ICT [ ]

   Contract management [ ]

   Other please state …….

2. What is your position?

   Procurement officer [ ]

   Deputy Director [ ]

   Director [ ]

   Accountant expenditure [ ]

   Other please state……..

3. Years of working experience in your organisation.

   Less than a year [ ]

   1-3 years [ ]

   4-7 years [ ]

   More than 7 years [ ]

4. Does your organisation use web-based system for procurement of goods and services?

   Yes [ ]

   No [ ]

Section B (a): Procurement structure

From your experience, what is the procurement structure at your organisation? Mark with (x) in the appropriate box provided for each question.

Centralized (i.e. the majority of purchasing is the responsibility of a single unit or designated units purchase particular products or services)	
Decentralized (i.e. responsibility for procurement is shared between departments)	
Outsourced (i.e. a private company carries out procurement on behalf of your Department)	
Mixed	

Section B (b): Procurement process in your organisation

From your experience, what are the current direct and indirect procurement practices at your organisation? Mark with (x) in the appropriate box provided for each question.

E-mail	
Paperwork	
Phone	
All of the above	

Section C: perceptions towards the adoption of e-procurement

From your experience, how are the following views best describe the adoption of e-procurement in your organisation? Make an (x) in a scale of: 1. strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: strongly agree

scale	1	2	3	4	5
1. Can improve short-term organisational performance	1	2	3	4	5
2. Can improve long-term organisational performance	1	2	3	4	5
3. Can reduce paperwork thus reduced costs	1	2	3	4	5
4. Can address unethical practice issues and increases transparency	1	2	3	4	5
5. Can improve turnaround time	1	2	3	4	5
6. Can better administrative costs with better effectiveness	1	2	3	4	5
7. Electronic payment to suppliers improve delivery	1	2	3	4	5

Section D: Factors influencing the adoption of e-procurement.

From your experience, how will the following factors influence the adoption of e-procurement in your organisation? Make a (x) in a scale of: 1. strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: strongly agree

scale	1	2	3	4	5
1. Employment of digital signature	1	2	3	4	5
2. Strategic necessity to compete in the marketplace	1	2	3	4	5
3. E-procurement make the purchasing process efficient	1	2	3	4	5
4. Mandatory use of e-procurement by the national government	1	2	3	4	5
5. Availability of IT infrastructures	1	2	3	4	5
6. Top management support	1	2	3	4	5
7. Visibility in supply chain operations	1	2	3	4	5
8. Provide fairness to all regardless of geographical location of the supplier	1	2	3	4	5

Section E: Barriers of e-procurement.

From your experience, how will the following challenges affect the adoption of e-procurement in your organisation? Make a (x) in a scale of: 1. strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: strongly agree

scale	**1**	**2**	**3**	**4**	**5**
1. Availability of supporting infrastructures	**1**	**2**	**3**	**4**	**5**
2. Unstable power supply	**1**	**2**	**3**	**4**	**5**
3. Lack of training regarding the implementation and use of e-commerce systems	**1**	**2**	**3**	**4**	**5**
4. Availability of financial resources	**1**	**2**	**3**	**4**	**5**
5. Fear of Cyber security	**1**	**2**	**3**	**4**	**5**
6. Low top management support	**1**	**2**	**3**	**4**	**5**
If other, please state					

Section F: Benefits of e-procurement.

From your experience, how will the following factors benefits enhance the adoption of e-procurement in your organisation? Make a (x) in a scale of: 1. strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: strongly agree

scale	**1**	**2**	**3**	**4**	**5**
1. Leads to cost reduction	**1**	**2**	**3**	**4**	**5**
2. Reduce paper consumption and other procurement expenses	**1**	**2**	**3**	**4**	**5**
3. Reduce human error	**1**	**2**	**3**	**4**	**5**
4. Increase supplier participations and competitiveness	**1**	**2**	**3**	**4**	**5**
5. Increase unlimited availability of information	**1**	**2**	**3**	**4**	**5**
6. Increase procurement quality and lead-time	**1**	**2**	**3**	**4**	**5**
If other, please state	**1**	**2**	**3**	**4**	**5**

The end, Thank you for your participation.

APPENDIX C: APPROVED GATEKEEPERS LETTER

provincial treasury
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Nokuthula Simelane Building, No. 7 Government Boulevard, Riverside Park Extension 2, Mbombela, 1200
Private Bag X 11205, Mbombela, 1200
Tel: 013 766 4572, Int: +27 (13) 766 4572

SigcinaMafa SesiFundza | UmNyango weeMali ZesiFunda | Provinsiale Tesourie

Enquiries : Ms C Nkonyane. 013 766 4523
Ref : MPT3/1/4

Ms Lewane Success Nchabeleng
University of Kwa-ZuluNatal
University Road Westville
Durban
4000

Dear Ms Nchabeleng

RE- REQUEST FOR PERMISSION TO CONDUCT AN ACADEMIC RESEARCH

1. Your letter dated 31 March 2022 on the above matter bears reference.

2. Upon due consideration of your request, the Provincial Treasury hereby grants you with permission to conduct your academic research on your topic: **Perceived factors affecting the adoption of e-procurement in the Mpumalanga provincial treasury**. You can liaise with the Chief Financial Officer, Mr MA Khoza at 013 766 4459 and makhoza@mpg.gov.za who can be of assistance in this regard.

3. Of importance herein, is to adhere to the provisions of the Promotion of Access to Information Act, 2000 (Act No. 2 of 2000) ("PAIA) and the protection of Personal Information Act, 2013 (Act No. 4 of 2003) ("POPIA") should a need arise for you to obtain information that may infringe on the rights of others and/or the Provincial Treasury.

4. Should you be found to be violation of the above-mentioned legislation or any relevant legislations in this regard, permission granted herein will be withdrawn with immediate effect and you will, then be subjected to applicable legal penalties provided for under the applicable legislation.

5. The Provincial Treasury wishes you well in your academic studies

Kind Regards,

MS GUGU MASHITENG
HEAD: PROVINCIAL TREASURY
DATE: 15 / 11 / 2022

MPUMALANGA
THE PLACE OF THE RISING SUN

APPENDIX D: LETTER REQUESTING PERMISSION TO CONDUCT RESULT

19 October 2022

Adjusted Request for Permission to Conduct Research

Dear Mr MA Khoza

My name is Lewane Nchabeleng, a Master in Supply chain Management student at the University of Kwa-ZuluNatal. I am currently beginning a research project; I wish to conduct my studies that is focused on the **Perceived factors affecting the adoption of e-procurement in the Mpumalanga provincial treasury.** Dr Eric D Ncube from the School of Management, IT and Government within the College of Law and Management, supervises the study.

The aim of the study is to assess the perceptions of employees and the current status of the adoption of e-procurement at the Mpumalanga provincial treasury. The success, challenge and influence factors remain an important part of the research. I have chosen the provincial treasury of South Africa because the department is the heart of the province in cases of supply chain management services. I believe the study will be able to provide the result from the participant's view to see if electronic procurement has benefits or challenges. The data collection will be non-probability approach; every employee chosen will be given equal opportunities. Age restriction will be between 18-70 years. Occupation from general worker to head of the department, both women and men.

I am writing to ask your permission to be allowed access to the facility with authorization to carry out questionnaires with staff in the ICT, supply chain management and finance department. The research will not take a large amount of time and will be conducted at a convenient time and date to be arranged. The questionnaire will be distributed to the chosen departments. In addition, note that all answers and results from the research will be kept strictly confidential and the results will be reported in a research paper available to all participants on completion.

If you require any further information, please do not hesitate to contact me at **Lewane.nchabeleng@ump.ac.za/nchabelengs@yahoo.com**. Thank you for your time and consideration in this matter.

Yours sincerely,

Lewane Success Nchabeleng
University of KwaZulu-Natal
Mobile number: 0785073037

APPENDIX E: ETHICAL CLEARENCE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

16 January 2023

Lewane Success Nchabeleng (222128723)
School of Management, IT & Governance
Westville Campus

Dear LS Nchabeleng,

Protocol reference number: HSSREC/00005050/2022
Project title: Perceived factors affecting the adoption of E-procurement in the Mpumalanga provincial treasury
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 23 November 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 16 January 2024.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

28 November 2023

Lewane Success Nchabeleng (222128723)
School Of Man Info Tech & Gov
Westville Campus

Dear LS Nchabeleng,

Protocol reference number: HSSREC/00005050/2022
Project title: Perceived factors affecting the adoption of E-procurement in the Mpumalanga provincial treasury
Amended title: Perceived factors affecting the adoption of electronic procurement in the Mpumalanga Provincial Treasury
Degree: Masters

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 16 November 2023 has now been approved as follows:

- Change in title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

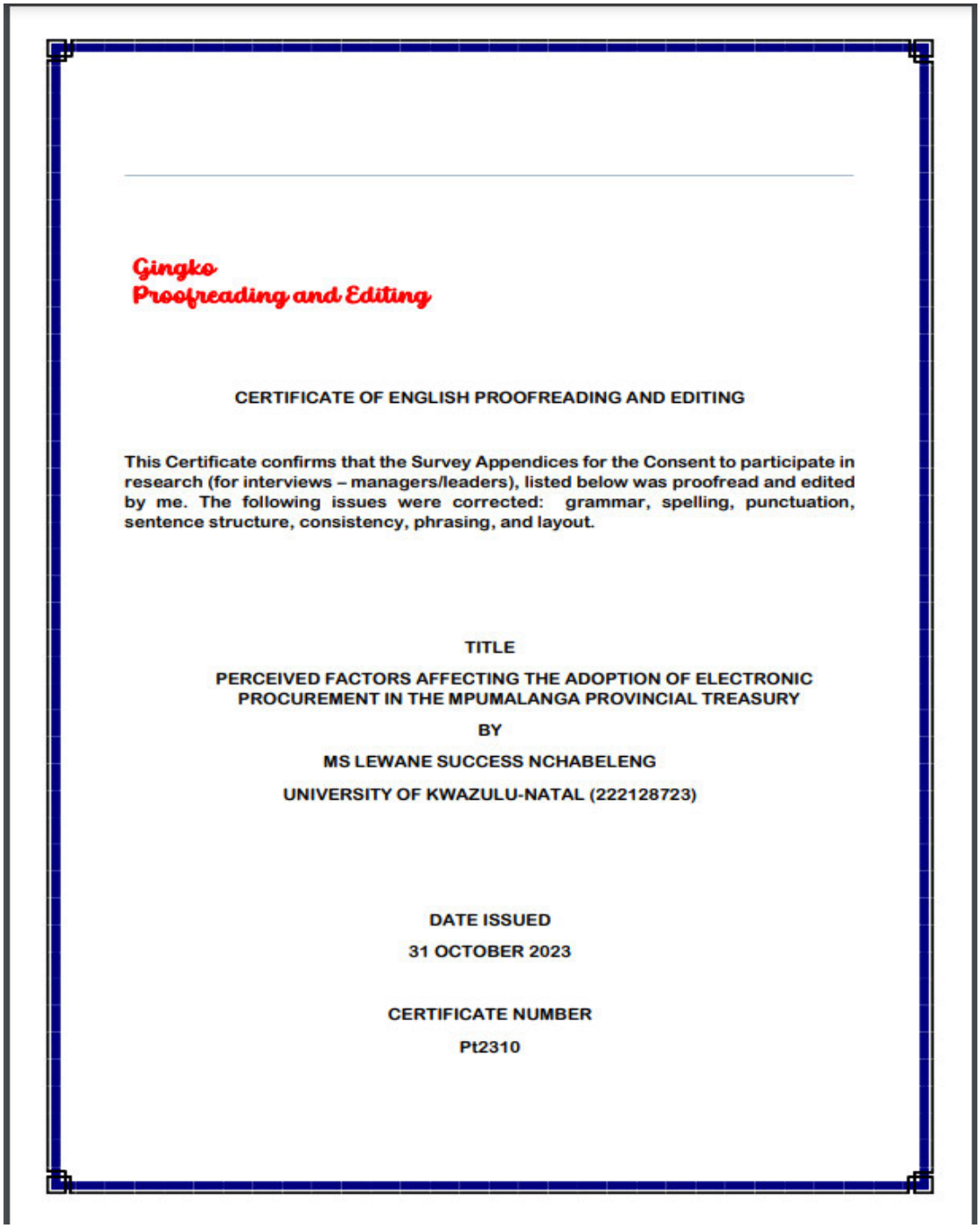
Best wishes for the successful completion of your research protocol.

Yours faithfully

Professor Dipane Hlalele (Chair)

/dd

APPENDIX F: LANGUAGE EDITING CERTIFICATE



Gingko
Proofreading and Editing

CERTIFICATE OF ENGLISH PROOFREADING AND EDITING

This Certificate confirms that the Survey Appendices for the Consent to participate in research (for interviews – managers/leaders), listed below was proofread and edited by me. The following issues were corrected: grammar, spelling, punctuation, sentence structure, consistency, phrasing, and layout.

TITLE

PERCEIVED FACTORS AFFECTING THE ADOPTION OF ELECTRONIC PROCUREMENT IN THE MPUMALANGA PROVINCIAL TREASURY

BY

MS LEWANE SUCCESS NCHABELENG

UNIVERSITY OF KWAZULU-NATAL (222128723)

DATE ISSUED

31 OCTOBER 2023

CERTIFICATE NUMBER

Pt2310