Perceived procurement challenges affecting Steve Tshwete Local Municipality.

PERCEIVED PROCUREMENT CHALLENGES AFFECTING STEVE TSHWETE LOCAL MUNICIPALITY

By

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DECLARATION BY THE CANDIDATE

I, Katlego Acadia Hlongwa, hereby declare that this research report is my own work and effort and that it has not been submitted anywhere for any award. Where other sources of information have been referred to and used, they have been duly acknowledged. It is submitted in partial fulfillment of requirements for the degree of Magister Technologiae: Supply Chain Management in the Faculty of Management Sciences of Tshwane University of Technology in Pretoria.

Signature: ___________________________

Date: 17 December 2024

DEDICATION

This dissertation is dedicated to my loving mother, who has been my constant pillar of strength in my life. The love and commitment you have shown me in my whole life has enabled me to improve myself academically and be a better person. I wish to express my deepest gratitude and appreciation to you for what you have done for me.

Katlego Acadia Hlongwa

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Katlego Acadia Hlongwa

ABSTRACT AAAA

The objective of study was to assess and evaluate obstacles that undermine the perceived quality of public procurement services that are performed in Steve Tshwete Local Municipality by employees of the municipality. Quantitative data was gathered from 147 employees of Steve Tshwete Municipality who worked on procurement services in the local municipality by using a questionnaire of study. The study was performed by using quantitative methods of data gathering and analyses including exploratory factor analysis. Exploratory factor analysis was used to identifying underlying dimensions affecting procurement service quality. The results showed that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards. The study found that the quality of procurement services performed by employees of the municipality was undermined by 3 factors. These 3 factors were regular awareness of employees about changes in procurement policy, the alignment of the budget with procurement plan, and the extent to which employees were capable of working on electronic public procurement system. A framework is developed based on findings obtained from the research.

Key words: Steve Tshwete Local Municipality, Public procurement services, Service quality

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LIST OF ACRONYMS

Acronym	Description of acronym
APS	Assessment of Procurement Services
ASCS	Assessment of Supply Chain Services
BPPS	Best Practice in Procurement Services
CEPS	Competitive Environment in Procurement Services
DVPS	Direct Verification of Procurement Services
DVSCS	Direct Verification of Supply Chain Services
EAM	Effective Assessment of Markets
EOPS	Electronic and Online Procurement Services
EDPS	Executive Decision on Procurement Services
FOPS	Fairness and Objectivity in Procurement Services
HFY	Highlights of Financial Year
FBAP	Facts Based Auditing Procedure
IMPS	Internal Management of Procurement Services
ISD	Integrated Service Delivery
OPP	Observed Procurement Procedure
PM	Procurement Management

PS	Procurement Services
PSCS	Procurement and Supply Chain Services
SCP	Supply Chain Process
SCM	Supply Chain Management
SLA	Service Level Agreement
SQS	Service Quality Standards
STI	Sexually Transmitted Infections
STLM	Steve Tshwete Local Municipality
TQMP	Total Quality Management Processes
TAAP	Transparency in Auditing and Accounting Procedures
ULPS	Unexplained Losses in Procurement Services
VDCI	Voluntary Disclosure of Conflict of Interest
WSPS	World Standard for Procurement Services
WTPS	Waiting Time in Procurement Services

CHAPTER 1: INTRODUCTION AND BACKGROUND TO STUDY

1.1: INTRODUCTION TO STUDY

The study investigates the perceived procurement challenges faced by Steve Tshwete Local Municipality. To achieve this, the following will be discussed: background and overview of the study, the problem statement, research objectives and questions. The Municipality relies on procurement services on a routine basis for rendering essential services. The aim of research is to explore socioeconomic and management related obstacles that undermine efficiency in procurement services. The research work will be valuable for minimising wasteful expenditure in the Municipality.

A procurer is responsible for the acquisition of services and goods from the most suitable service providers at the lowest possible cost without lowering service level agreements and the quality of products, goods and services. The most efficient procurer is capable of avoiding wasteful expenditure while maintaining quality and levels of agreement between service providers and consumers (Lawal, 2015:6). According to Zimmermann and Foerstl (2014:37), organisations rely heavily on procurement to enhance their operations. A municipality's procurement department has a duty to comply with high levels of service quality, efficiency, ethical obligations and professional obligations in terms of saving money and minimising loss and adhering to service level agreements and specifications (Dzuke & Naude, 2015:1). As a consequence, public procurement processes must be constantly evaluated. Reis and Cabnal (2015:104) highlight the need for the industry to adopt new techniques to boost competition and innovation within procurement.

1.1.1: Key functions of a procurement employees

According to National Treasury (2013), a municipality's resources should be used effectively, efficiently, and economically with the help of containment regulations. Section 168 (1)(b) and (p) of the Municipal Finance Management Act (MFMA) shows internal control measures and processes to be followed on the expenditure of municipal money by procurers and parties who represent municipalities. These control measures are informed by fiscal discipline, ethical conduct, knowledge of local and international markets, and product and service quality.

The study has the potential to examine procurement challenges that are known to affect supply chain efficiencies (Auditor-General South Africa, 2020:3). Competent and ethically responsible procurers are accountable, duty-bound, rule-bound, honest, fair, transparent, cost effective and competitive. Competent procurers know their markets, services, products and goods well enough and are capable of ensuring the optimal utilisation of municipal resources (Ambe & Badenhorst-Weiss, 2012:243). The study will help draw valuable lessons from procurers working at Steve Tshwete local municipality in Mpumalanga Province, South Africa.

The aim of public procurement is to ensure that procurement and service delivery processes are carried out efficiently in a manner that is fair, equitable, transparent, competitive, and cost-effective (Davey & Gtaenby, 2017). Kioko and Were (2014:1) have investigated factors that affect the efficiency of procurement functions and processes in Kenya, using both qualitative and quantitative methods. The authors have identified barriers to efficiency in public and private procurement processes by performing the analysis of variables such as the level of technical and managerial skills, years of experience, competencies of fellow employees and line function managers, legal framework, institutional culture, ability to use appropriate information technology (ICT) procedures.

1.1.2: Responsibilities of procurement employees

The key responsibilities of procurement employees include the ability to identify the best possible service provider at the lowest possible cost of service delivery. Hanak and Korytarova (2019:1) have performed the analysis of factors that undermine efficiency among procurers working in Czech Republic municipalities and have identified socioeconomic and management related factors that undermine efficiency in procurement services. The authors have found a significant relationship between the ability of procurers to follow internal control measures and the minimisation of wasteful expenditure. Examples of main obstacles to efficiency were inability to follow instructions, failure to follow internal control measures, lack of understanding product specifications and local markets, and inability to critically examine markets. Addo (2019:44) has assessed procurement related factors with regards to the successful adoption of e-procurement in Ghana. The author has found that the ability of procurers to follow internal control measures and their level of knowledge of the market are major determinants of success among procurers working in Ghanaian municipalities.

The survey conducted in Ghana by Ofori and Fuseini (2020:18) indicates that Ghanaian municipalities promote the adoption of e-procurement services by rolling out regular training, mentoring and coaching services for civil servants working in local municipalities. These measures have been found to be effective and helpful to municipalities in terms of saving municipal resources, manpower and infrastructure. The authors have found that e-procurement processes save money and time, while promoting accountability, efficiency and transparency.

The Auditor-General of South Africa (2019:1) posits that the successful adoption of e-procurement is a critical success factor for effective procurement in South African municipalities. The successful adoption of e-procurement requires awareness education, organisational support, infrastructural investment, training, control measures, monitoring and technical training. Khan (2018) informs us that it is possible to save huge sums of money and resources by adopting e-procurement in municipalities. The report also shows that South African municipalities can enhance their service delivery outputs by adopting e-procurement techniques and applications. Moe, Newman and Sien (2017:143) posit that the ability to procure effectively requires the adoption of e-procurement processes as well as the implementation of internal control measures at all levels. Key areas of relevance are seeking approval for procurement based on verifiable and transparent processes, a fair, transparent and objective bidding process, the approval of contracts based on verifiable processes, and ensuring the delivery of contracts by transparent and verifiable processes (Moe, et al., 2017:145).

The research conducted by Ye, Suleiman and Huo (2022: 1666) shows that factors that affect procurement processes in municipalities have not been investigated exhaustively. Most investigations target specific challenges that are unique to the jurisdiction in question. The findings from such investigations may not be generalisable to other municipalities because of the varied policies, operations strategies, resources and challenges. To this end, this study aims to investigate perceived procurement challenges of a South African municipality focusing on the effect of employee competency, legal framework and technological infrastructure.

1.2: BACKGROUND TO STUDY

The aim of public procurement is to ensure that procurement and service delivery processes are carried out efficiently in a manner that is fair, equitable, transparent, competitive, and cost-effective (Davey & Gtaenby, 2017). Kioko and Were (2014:1) have investigated factors that affect the efficiency of procurement functions and processes in Kenya, using both qualitative and quantitative methods. The authors have identified barriers to efficiency in public and private procurement processes by performing the analysis of variables such as the level of technical and managerial skills, years of experience, competencies of fellow employees and line function managers, legal framework, institutional culture, ability to use appropriate information technology (ICT) procedures.

1.2.1: Obstacles to efficiency in procurement services

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A review of the literature shows that factors that affect procurement processes in municipalities have not been investigated exhaustively. Most investigations target specific challenges that are unique to the jurisdiction in question. The findings from such investigations may not be generalisable to other municipalities because of the varied policies, operations strategies, resources and challenges. To this end, this study aims to investigate perceived procurement challenges of a South African municipality focusing on the effect of employee competency, legal framework and technological infrastructure.

The legal framework comprises documents such as the constitution, legislation, regulations, and contracts (Reis & Cabnal, 2015: 103-110). The South African National Treasury (2022) has listed down essential procurement guidelines and regulations to all South African municipalities under Section 217 and Regulations 3(b), 4 and 9 of the Preferential Procurement Regulations of the year 2000. In the context of this study, the non-validity of these regulations affects all procurement above R30, 000 (including VAT). As a result of this failure, the quality and efficiency of service delivery will be compromised. Pooe, Mafini and Makhubele (2015:67-78) have investigated challenges that often lead to failure to comply with existing public procurement policies. Causes of failure identified by the authors include failure to comply with internal control measures, flouting auditing processes, lack of transparency, lack of technical skills in auditing and accounting, and inability to curb excessive irregular expenditure.

1.2.2: Acute shortcomings in procurement services

The South African Municipal Systems Act (Act no. 32 of 2000) provides explicit details about the obligations of municipalities in terms of service delivery. Guidelines stipulated in the Batho Pele Principle and legislative framework are outlined in Integrated Development Plans (IDPs) of each municipality in the form of performance management indicators (Gaffoor & Cloete, 2010:2). However, Municipalities nationwide face significant challenges in the implementation of this policy framework (South African Auditor-General, 2019:1; 2020:2).

Lack of technical skills among muncipal employees

An employee competency is a list of specific skills and behaviors that outline the performance expectations of an organisation for a specific job or an organisation's culture (Wulansari & Rahmi, 2018). The lack of employee competencies emerged as a major and common challenge faced by many municipalities in South Africa. Human resources management faces one of the greatest challenges in modern times: attracting and retaining top performers (Koketso & Rust, 2012:2221). According to Luthuli, Nywao and Mashau (2019:20), the lack of training and development in the municipality leads to demotivated employees and increased labour turnover. Results of the study suggest that it is imperative to align training and development programs with employee needs to effectively equip and motivate employees. Because of the lack of training among municipal employees, new procurement regulations have been difficult to implement in the municipalities.

Ababio, Vyas-Doorgapersad and Mzini (2019) have found that financial managers try to adapt to new legislation and improve processes on a daily basis, all within the constraints of limited workforces because of retirements and transfers to other positions. Generally, these challenges slow down the contracting and procurement process significantly. Resultantly, municipalities experience the phenomenon of under-expenditure and services are delayed.

Technological skills and infrastructure

Inability to use appropriate technological tools and applications is a main obstacle to effective procurement processes. Technological skills and infrastructure should be adequate for effective procurement processes in municipalities. Processes such as e-procurement, e-governance and e-commerce are highly relevant and valuable for procurement services in municipalities. It is essential to adopt and use e-procurement processes to save municipal resources from waste and corruption (Akay & Azanlerigu, 2015). The use of appropriate technology is a critical success factor for e-procurement implementation in all municipalities (Almanasreh, Moles & Chen, 2022).

Efficiency in supply chain management

Supply chain efficiency refers to a company's ability to use resources, technology, and expertise to minimise logistics costs and maximise profits (Stumberg & Meulen, 2019:1). Davey and Gtaenby (2017) state that it has been difficult to use public resources effectively due to lack of efficiency in supply chain management processes. Helpful measures are training, close supervision, the implementation of internal control processes, awareness campaigns, mastery of markets, and compliance with ethical guidelines (Mahamandu, 2018). All municipalities are required to use their financial and human resources according to integrated development plans (IDPs). Failure in this regard is a main cause of failure in South African municipalities (Ambe & Badenhorst-Weiss, 2012).

1.3: PROBLEM STATEMENT

Surveys conducted by Mojaki, Tuyikeze and Ndlovu (2024), Manyathi, Burger and Moritmer (2021), Ngcobo and Conradie (2024) and Williams (2023) show that the quality and efficiency of procurement services in public sector entities such as local municipalities are often undermined due to failure to address comments, remarks and recommendations issued to them by the South African Auditor-General. The authors have pointed out that guidelines and processes that are stipulated in the Public Finance Management Act (Act no. 1 of 1999) and the Municipal Finance Management Act (Act no. 56 of 2003) are often disregarded due to lack of capacity, lack of adherence to National Treasury guidelines, and lack of specialised skills in auditing, accounting and procurement processes. Mojaki, Tuyikeze and Ndlovu (2024), Manyathi, Burger and Moritmer (2021) and Ngcobo and Conradie (2024) state that transparency, accountability, good governance and good leadership are critical aspects of a successful public procurement service in local municipalities. Not enough is known in the literature about specific factors that undermine the quality and efficiency of public procurement services that are rendered in Steve Tshwete Municipality. The gap identified by the above authors is that there is a need for current research and empirical evidence which is based on actual surveys that are conducted by gathering data from Steve Tshwete Local Municipality. This study aims to fill this specific gap in the literature.

1.4: RATIONALE OF STUDY

The study has numerous benefits to knowledge. Not enough is known about factors that undermine efficiency and quality in public procurement processes that are carried out at Steve Tshwete Local Municipality. This study has the potential to make a valuable contribution to knowledge by gathering fresh data from the local municipality. Mojaki, Tuyikeze and Ndlovu (2024) point out that there is a need to enhance the current level of compliance with guidelines that are issued by the National Treasury to local municipalities such as Steve Tshwane Municipality in preparing mid-term expenditure framework (MTEF) documents. Guidelines and processes stipulated in MTEF documents are helpful for saving wasteful expenditure and deterring the abuse of public funds. Manyathi, Burger and Moritmer (2021) state that the major obstacles in the public sector are lack of skills in auditing and accounting procedures, failure to verify the credentials of people who apply for public sector tenders, lack of good governance, and political interference in public procurement processes. Efficient procurement services are highly significant for the achievement of municipal goals and targets. This area of research has not been investigated exhaustively in Steve Tshwete Local Municipality. Procurement plays a significant role to organisational functionality. Resources such as physical and technological resources are pertinent for the implementation of organisational strategies. Procurement supports organisational strategic implementation through effective, economical, and efficient acquisition of resources for deployment by the organisation. While procurement importance may be well documented, the challenges that organisations face are unique and varied. There is no ‘one size fits’ all solution to procurement challenges. This study specifically investigates the challenges faced by Steve Tshwete Local Municipality. The problem identified is the lack of sufficient knowledge of procurement related challenges faced by employees working at Steve Tshwete Local Municipality. This problem has led to inefficient municipal service delivery. The study aims to make an original contribution to knowledge by expounding on existing literature and proffering recommendations based on empirical evidence of the procurement challenges faced municipalities.

Mojaki, Tuyikeze and Ndlovu (2024) and Ngcobo and Conradie (2024) point out that there is a need to enhance the current level of efficiency and quality in procurement services that are rendered in South African local municipalities such as Steve Tshwete Local Municipality. This study aims to make an original and valuable contribution to knowledge by gathering empirical data from Steve Tshwete Local Municipality.

1.5: RESEARCH QUESTIONS OF STUDY

The aim of research was to determine socioeconomic factors that undermine the ability of procurement employees working at Steve Tshwete Local Municipality (STLM) to render quality procurement services.

Secondary research questions of study

The research aims to provide adequate answers to the following secondary research questions:

- What is the percentage of procurement employees working at Steve Tshwete Local Municipality who render satisfactory services?
- What socioeconomic factors undermine the quality of procurement services provided at the Steve Tshwete Local Municipality?
- What remedial actions can be taken to enhance the quality of procurement services that are provided at the Steve Tshwete Local Municipality?

1.6: OBJECTIVES OF STUDY

Overall objective of research

The overall objective of study is to explore socioeconomic factors that affect efficiency in supply chain and procurement processes in Steve Tshwete Local Municipality.

Secondary objectives of research

The research was carried out to meet the following specific objectives:

- To estimate the percentage of procurement employees who perform adequately at Steve

Tshwete Local Municipality.

- To determine socioeconomic factors that undermine performance by procurement employees working at Steve Tshwete Local Municipality.

- To construct a practical framework that could be performed for enhancing the level of performance of procurement employees working at Steve Tshwete local municipality.

- To draw up feasible recommendations that are helpful for enhancing the level of performance of procurement employees working at Steve Tshwete local municipality.

1.7: RESEARCH HYPOTHESES

A research hypothesis is vital for finding out the validity of an assumption or prior belief held by researchers. By testing the validity of a research hypothesis, it is possible to determine whether or not a prior belief or assumption is correct. Research hypotheses are usually tested for validity at the 5% level of significance. A null hypothesis is rejected at the 5% level of significance if the probability value falls below 5%. A null hypothesis cannot be rejected at the 5% level of significance if the probability value is greater than or equal to 5%. This research work was carried out to test the following three research hypotheses.

Research hypothesis 1:

The quality of procurement services performed by employees of the municipality is not associated with the extent to which employees were made aware about changes made to the procurement policy of the local municipality.

Research hypothesis 2:

The quality of procurement services performed by employees of the municipality is not associated with the extent to which the municipal budget is aligned with the procurement plan of the municipality.

Research hypothesis 3:

The quality of procurement services performed by employees of the municipality is not associated with the extent to which municipal employees are capable of utilising electronic public procurement procedures effectively.

1.8: CHAPTER OUTLINE

Six chapters are used for writing up the dissertation. At the end of the sixth chapter, there is a list of references. Following the list of references, the questionnaire of study is provided. Next to the questionnaire of study, a computer printout of data analyses is provided.

Chapter 1 : Introduction and background of study

Chapter 1 gives an overview of the research, the aim and purpose of study, and the main motivations that prompted the study. This involves the general and specific aims and objectives of research as well as its potential advantages.

Chapter 2: Literature review

This chapter of thesis gives a structured review of the literature on procurement services based on local and international best practice.

Chapter 3: Methods and materials of study

This chapter of thesis gives details about sampling techniques, the design of study, the use of quantitative methods of data analyses, statistical methods of data collection and analyses, and statistical goodness-of-fit tests that are used for ensuring the theoretical reliability of estimated results of data analyses.

Chapter 4: Results of study

Chapter 4 gives results of statistical data analyses along with interpretations and graphical depictions and narratives. Graphs are sketched in Excel by using pie charts and bar charts.

Chapter 5: Discussion of results

In this section of the thesis, a discussion of results of data analyses is given.

Chapter 6: Conclusions and recommendations

Chapter 6 provides the conclusions, recommendations and limitations of research.

1.9: CHAPTER SUMMARY

Chapter 1 has provided an introduction to the study, the background to the study, the potential benefits of study to knowledge, the aims and objectives of study, the research problem, and the research hypotheses tested by the study. Chapter 2 will present a structured review of the literature.

CHAPTER 2: LITERATURE REVIEW

This chapter provides an overview of procurement processes that are followed at Steve Tshwete Local Municipality (STLM) in Mpumalanga province. The chapter presents a critical review of procurement processes and supply chain management in the public sector. This will be followed by a discussion of the theories that broadly underlie procurement practices and the relevance of these theories to this study. The section will then provide an insight into the determination, including determinants, of challenges and risks faced by organisations in relation to best practice in the field of public procurement.

As a final section, the chapter will provide a comprehensive analysis and contextualisation of publications on the challenges municipalities face in the field of public procurement. A critical assessment will be made based on what has been reported in the literature. A gap will be identified. Examples of local and international best practice will be provided. Theoretical principles that are relevant to the study will be presented. The benefit of such theoretical principles will be discussed.

2.1: AN OVERVIEW OF PROCUREMENT SERVICES IN THE PUBLIC SECTOR

A preference system was introduced in 1995 as part of the procurement reforms in the South African government focusing on promoting good governance and addressing socioeconomic goals. A number of legislations were introduced to support the procurement reform process, including the Municipal Finance Management Act and the Preferential Procurement Policy Framework Act (National Treasury, 2003).

2.1.1: The current state of procurement services in the public sector

In accordance with Section 217 of the Constitution of the Republic of South Africa (Republic of South Africa, 1996), the PPPFA endorses the implementation of a procurement strategy that provides priority to contracts and avoids unfair discrimination. PPPFA stipulates that the Reconstruction Development Programme (RDP) objectives, functionality, and pricing must all be taken into account when the government evaluates contracts. To advance the objectives of the Broad-Based Black Economic Empowerment Act (B-BBEE Act) and its strategy, the Department of Trade and Industry (DTI) and the National Treasury amended the PPPFA following the approval of the B-BBEE Codes of Good Practice in 2006, since the two legislations were not aligned. As a result of alignment, the Preferential Procurement Regulations (PPR) were amended in 2011 (National Treasury 2011). According to Ambe and Badenhorst-weiss (2012), the procurement process was constitutionalized mostly due to failure to adhere to recommended guidelines and ethical principles. The authors posit that there is a need for a fair, equitable, transparent, competitive, and cost-effective procurement system in South Africa.

Procurement and supply chain management services in South African municipalities

In addition to the procurement reform processes discussed above, a number of legislative measures were introduced to support the procurement reform process. Therefore, Municipal

Finance Management Act (MFMA) and Preferential Procurement Policy Framework Act (PPPFA) were adopted in support of the procurement reform process (National Treasury, 2003). The purpose of the study is to investigate perceived procurement challenges affecting Steve Tshwete local municipality, they are discussed below by different school of thoughts.

The lack of suitable processes and procedures has caused procurement performance to suffer, attracting the attention of scholars, practitioners, academics, and researchers worldwide. Public procurement performance is affected by various factors, including procurement processes, ICT adoption, ethics, and supplier relationships. Public procurement has been widely publicised due to the reluctance of current regulations to encourage the use of technology during procurements and long-term relationships between buyers and suppliers. According to (Transparency International Corruption Perception Index, 2012), maintaining strong ethical standards in the procurement process has continued to be a challenge, placing the country at number 139 of 174 economies worldwide. According to the research study's findings, a review of the laws currently in place in Kenya can only help improve its public procurement performance by promoting the extensive use of technology to manage the procurement process, building long-term relationships between buyers and suppliers, and engaging stakeholders through training and awareness campaigns regarding ethical procurement practices.

2.1.2: Obstacles pointed out by the South African Auditor-General

A growing number of public procurement activities are subject to increasing scrutiny by the South African Auditor-General and stakeholders who are affected by the quality, efficiency and reliability of procurement services that are routinely provided to public sector entities. This process is a result of advances made in the utilisation of digital systems of saving, auditing, accounting, reporting, and verifying financial information to stakeholders and the South African National Treasury. Utilisation of digital and online systems for auditing, reporting and accounting is also a result of e-governance systems and processes that are being promoted in local municipalities and Government Departments.

The South African Auditor-General issues audit reports with specific comments, remarks, and feasible remedial actions that are in line with the Public Finance Management Act (Act no. 1 of 1999) and the Municipal Finance Management Act (Act no. 56 of 2003). Procurement services and processes are currently managed by using digital and online systems and processes that are easy to access, verify and scrutinise by all relevant stakeholders. The use of e-governance processes has improved the accuracy of auditing, accounting and financial reporting systems that are essential for public procurement duties and functions. Mojaki, Tuyikeze and Ndlovu (2024) point out that digital procurement processes are highly valuable for deterring corruption in the public sector. Manyathi, Burger and Moritmer (2021) state that efficient public sector procurement services are essential for the delivery of improved service delivery.

Ngcobo and Conradie (2024) state that transparency, accountability, good governance and good leadership are critical aspects of a successful public procurement service in local municipalities. Williams (2023) states that highly talented female auditors and accountants should be actively encouraged and supported to work on public procurement services and processes to promote efficiency in procurement services and to enhance better compliance with National Treasury guidelines.

Mojaki, Tuyikeze and Ndlovu (2024), Manyathi, Burger and Moritmer (2021), Ngcobo and Conradie (2024) and Williams (2023) state that the main obstacles pointed out by the South African Auditor-General on public procurement processes followed in public sector entities include lack of expertise and skills in basic auditing, reporting and accounting skills, inadequate compliance with PFMA and MFMA processes, poor motivation in enhancing level of skills in the utilisation of digital and online systems, difficulty in sharing financial and audit-related information in good time with stakeholders, incompetence in complying with guidelines issued by the South African National Treasury on public procurement processes, a large number of deviations from guidelines and processes, unauthorised approval of purchases and acquisitions of public assets and logistical resources, inadequate skills in writing up audit and financial statements and reports, deviations from mid-term expenditure framework (MTEF) guidelines and processes that are recommended by the South African National Treasury to public sector entities, local municipalities and provincial Governments, inadequate competence in verifying the credentials of people who apply for public sector tenders, and political interference in public procurement processes with a view to influence the outcomes of public tender processes.

The South African Auditor-General issues qualified auditor reports to public sector entities with the expectation that comments, remarks and recommendations are implemented successfully by all relevant stakeholders in the next round of audit review processes. However, Mojaki, Tuyikeze and Ndlovu (2024), Manyathi, Burger and Moritmer (2021), Ngcobo and Conradie (2024) and Williams (2023) point out that public sector entities often fail to follow recommendations given to them in audit-reports by the South African Auditor-General. Failure to adhere to National Treasury guidelines leads to wasteful expenditure in public sector entities (Bolton, 2006; Eyaa, & Oluka, 2011). Procurement remains a significant component of the public sector in South Africa because of the unfair and discriminatory procedures used during apartheid (Bolton, 2006).

2.2. FACTORS THAT AFFECT EFFICIENCY IN PROCUREMENT SERVICES

Several principles of public procurement are common to most, most or many public procurement systems, some of which are shared. Public procurement procedures are one way of implementing these principles through legal and regulatory rules. This study is intended to achieve the following specific objectives in order to achieve its main objective:

2.2.1: Ensuring value for money in procurement

Obtaining goods, works, or services for the lowest possible price is the primary goal of most-if not all-procurement systems. Value for money is often measured and referred to as efficiency, economic efficiency, or economic effectiveness. A good value for money must be attached to goods, works, and services in order for the local government to function efficiently (Badi, & Murtagh, 2019).

There are three important aspects to achieving this objective: evaluating the goods, services, or work acquired, negotiating a deal to get what is required on the best terms, and knowing the contractor can provide what is required. In most procurement systems, this is the primary objective.

2.2.2: Integrity (avoiding corruption and conflict of interest)

As a general principle, integrity implies that procurement should not be influenced by government or bidders. Often, this is accomplished through collusion of the government with bidders, like awarding contracts based on bribes to firms where one has a payroll interest and relationship (Ansell, & Boin, 2019). Consequently, the government cannot benefit from a fair competition's best offer, so disclosure and transparency are crucial to ensuring fair competitions and fair procurements (Azanlerigu, & Akay, 2015).

2.2.3: Accountability

As part of its accountability function, it also allows interested parties to assess whether the government is fulfilling its mandate. In addition to achieving many procurement system objectives, it ensures the integrity of the procurement process (Baker, 2006).

2.2.4: Equal opportunities and treatment of supplies

In the public procurement context, equal treatment can mean two different things. In public procurement, equality of treatment can be used to achieve other objectives, such as obtaining goods, works, and services at competitive prices, preventing corruption, and opening up markets. Secondly, the procurement process can also seek to achieve equal treatment as a standalone objective in addition to supporting other procurement objectives (Bhandal, Meriton, Kavanagh & Brown, 2022).

2.2.5: A fair treatment of supplies

Thus, suppliers can make their case before being excluded from procurement, thereby improving the quality of debarment decisions and possibly preventing unjustified debarment of companies that may provide good value; however, requiring suppliers to explain why decisions against them were made may improve the quality of procurement decisions and supplier monitoring (Bhardwaj & Ketokivi, 2021).

2.2.6: Guiding principles of public procurement services in municipalities

Public procurement relies on open competition in order to use public funds most efficiently (Gavurova & Kubak, 2021:240). There are discrepancies in the language and body of information used to comprehend procurement across all levels of government. The public procurement has been viewed from a variety of angles, from simple ordering to in-depth budgetary research. The difficulty in defining the field and settling upon its focus has hampered attempts to define it. This subsection examines several ramifications of public procurement's murky nature, which has prompted speculation and ambiguity about the right role for practitioners. A procurement process involves acquiring goods, works, and services from both internal and external vendors for the public sector (Brewer & Arnette, 2017).

Moreover, according to various academics in supply chain management, public procurement refers to the legal authority that advises, plans, obtains, delivers, and evaluates government purchases of goods and services for the achievement of stated objectives, obligations, and activities in accordance with desired policy outcomes (Butner, 2010; Aberu, 2019; Abutabenjeh, 2021). Addressing the conceptual ambiguity of the word "public procurement" is an essential first step in developing a suitable body of knowledge for the topic. Ex ante understanding of the bounds, scope, and domain of public procurement's goals, practices, and outcomes is essential given the field's potential to improve governance. Individuals outside those formally recognised as procurement practitioners may think that they are more appropriately qualified to handle the concept and actions related to public procurement in the absence of such an exercise.

A human resource manager might consider gathering information about a purchase from various suppliers, looking into the suitability of various suppliers, ensuring that the supplies are delivered, verifying that what was ordered was actually received, and discarding all used supplies as some of the most frequent tasks that procurement practitioners perform on the job, but not all of these tasks may be best handled by procurement managers.

Consequently, it becomes apparent that choosing whether to supply the service internally or to outsource it from the market constitutes a substantial part of the procurement process (Aberu, 2019).

2.2.7: Implementation of supply chain management services in the public sector

A vital component of the public sector's supply chain is public sector supply chain management, which defines the composition of public supply chains and multilevel networks (Aberu, 2019). It is the government's responsibility to procure goods and services necessary for carrying out its missions through public procurement (Aberu, 2019). Addo (2019) defines public procurement as the process of procuring goods and services by municipalities. Public entities' supply chains can be supported by numerous activities, but basic needs and improved infrastructure are the most crucial. According to Addo (2019), public procurement entails procuring goods and services on behalf of a municipality via any contractual mechanism. A wide range of stakeholders are involved in delivering activities within the public sector supply chain. Anane, Adoma and Awuah (2019) posit that different stakeholders are involved in the public sector supply chain. An array of actors participates, including private firms receiving orders from public sector agents, accountants, and policymakers.

Government institutions implement a variety of supply chain management practices. In the municipalities, for example, the policies are meant to encourage local economic development, harmony and a healthy business climate within the municipality. In order to achieve their socioeconomic goals, which include promoting the growth of eligible small firms and exempted microenterprises, particularly of the historically disadvantaged, governments around the world are using preferential procurement policy methods (Ambe & Badenhorst-Weiss, 2012).

Therefore, it is sufficient to declare, with sufficient certainty that the financial issue goes well beyond the ideas of merely spending and savings. It includes several areas and sub-disciplines that are outside the scope of this study project. However, a brief introduction to the ideas of public finance, financial literacy, and financial management is regarded necessary due to their close alignment to the research topic at hand.

2.2.8: Budgets in supply chain management services

Budgets provide estimates of revenues and expenditures for a particular period of time (Downes, & Goodman, 2006). According to the IMF Glossary of Selected Financial Terms (2006), a budget presents projections of revenue, expenditure, and the financing of a business' surpluses or deficits. Therefore, the budget of a local government usually covers a 12-month financial year. The National Treasury normally provides detailed instructions to all other government entities for budget preparation and approves the budget. In order to ensure good financial governance, after the budgets are approved, the implementation stage begins, during which revenues are collected and budget activities are funded.

In the Constitution of the Republic of South Africa, Section 216 stipulates good financial governance (RSA 1996). As a result of Section 87 of the Public Finance Management Act (PFMA) (RSA 1999), the Accounting Standards Board (ASB) was established. According to Section 216(a) ASB sets financial statement standards and guidelines in accordance with the Constitution of the Republic of South Africa. Financial governance is the implementation of Generally Recognised Accounting Practices (GRAPs) in all three spheres of government. As part of the in-year budgetary monitoring process, good financial governance is further enhanced. As outlined in Section 71 of the MFMA (RSA 2003), "Monthly reporting" takes place every month, "quarterly monitoring" is carried out under Section 52(d) of the MFMA (RSA 2003), and "mid-year assessment" can be conducted as well. Adjustments to the budget can be made to account for reallocations and changes in priorities. The performance of service delivery is included in both quarterly and mid-year reporting. As a result, the three sets of reporting which is the municipal council, COGTA, and National Treasury have an oversight mechanism. By proactively preventing fiscal distress, this good financial governance helps municipalities ensure financial sustainability.

As a local government's finances deteriorate, it has chronic difficulties in balancing the budget, and it has the tendency to have vanity projects as it depletes surplus funds (Schick, 1988).

2.3. BEST PRACTICE IN PROCUREMENT SERVICES

Various researchers have shown the numerous benefits of ensuring the competencies of employees and officials working on public procurement processes in South African public sector entities. The main benefits of ensuring competence in procurement employees and officials are the ability to save public resources such as manpower, money and logistical resources and protecting the public infrastructure from abuse, neglect and deterioration.

2.3.1: Ensuring the competency of procurement employees

An employee competency is a collection of precise abilities and conduct that describes the performance standards of a company for a given position or the culture of the organization (Wulansari, & Rahmi, 2018). The absence of personnel competences has become a significant and widespread issue for many municipalities in South Africa. Recruiting and keeping top performers is one of the biggest issues facing human resources management in the modern day (Koketso, & Rust 2012). Aberu (2019) posits that there is an increased turnover of employees in the municipality as a result of insufficient training and development. The study's findings indicate that in order to adequately prepare and inspire personnel, training and development programs must be in line with their needs. New procurement standards have been challenging to implement in the municipalities due to a lack of training among municipal staff. In addition, the findings suggest that the municipality should make sure its training and development programs comply with its requirements.

According to guidelines stipulated by the South African National Treasury (2016, 2021, 2022), municipal procurement officials need to be able to use applications that provide distribution chain management and value-added services. It is necessary for the implementation management to take into account software, data, and specifications of systems when managing implementations. Addo (2019:49), states that a number of challenges may arise because of the characteristics of an organisation, including the competencies of its employees, the legal framework, and the technological infrastructure, as well as concerns about procurement data security and privacy.

According to Srai and Lorentz (2019), ensuring fiscal discipline at municipal level requires strict monitoring, evaluation and control as well as compliance with guidelines recommended by the South African National Treasury to local municipalities. Developing strategies to control public spending in response to service delivery are not funded adequately. In accordance with the report, financial managers constantly labour to enhance procedures and adjust to new laws, all while working with a smaller workforce as a result of retirements and job transfers. These difficulties typically cause the contracting and procurement process to go very slowly. As a result, towns suffer from the under-expenditure phenomena and services are delayed.

2.3.2: Technological infrastructure

Literature on public procurement shows that modern technologies, such as e-procurement, are used to improve supply chain procedures. Creation and deployment of information systems is a crucial aspect of electronic procurement. According to Azanlerigu and Akay (2015), through the customer's information infrastructure and supplier relationships, system integration is recognized as a crucial success factor for the endorsement of e-procurement. Integrating public procurement will not be possible without a solid technological foundation, which is needed to implement e-procurement. Due to the explosion of e-commerce in business-to-business marketplaces, organizations around the world have adopted a wide range of new supply chain technologies and applications. Furthermore, e-procurement improves transparency, accessibility, and competition in public procurement procedures, which contributes to economic growth (Addo, 2019:49). There is a significant increase in e-procurement applications for both strategic sourcing and general purchases, which has been detrimental to procurement (Dunn, 2017).

A better understanding of the various levels of infrastructure and of the differences between municipal procurements and suppliers would allow the government to estimate the amount of investment needed for e-procurement. By implementing e-procurement, public institutions have enjoyed numerous targeted benefits including improved transparency, contract award notices, online bid submission, and improved tenderer participation as a result of better information and access to opportunities (Mhelembe, 2018:13). Therefore, foregoing, staff competencies, statutory frameworks, and technology infrastructure are crucial in the procurement process.

It's more difficult to adopt e-procurement in the public sector than in the private, where efficiency, cost reduction, and time savings are sufficient justifications (Aberu, 2018). There are many benefits to government procurement, such as achieving national interests, distributing resources, and promoting equity. Consequently, the procurement process may not simply be based on economy and value for money.

In the world of business, the internet has brought huge changes. As a result, it has gained market share, such as a greater reach to customers and a reduction in its users' cost.

2.4. LEGISLATIVE REQUIREMENTS REGULATING PUBLIC PROCUREMENT

The legal system is composed of papers like the constitution, laws, rules, and contracts (Ravitch & Carl, 2017). Regulations 3(b), 4 and 9 issued to South African local municipalities by the South African National Treasury (2022) have been taken on appeal to the South African Supreme Court of Appeal, and have since been declared invalid by the South African Supreme Court of Appeal because of what it determined to be the interconnections between the regulations and because the content of the regulations went beyond what the minister was authorised to regulate under section 5 of PPPFA and section 217 of the Constitution. This does not mean that guidelines issued to local municipalities by the South African National Treasury may be disregarded by local municipalities. Although such guidelines could have minor procedural flaws, they are, by and large, correct, highly relevant, highly valuable, and should be adhered to in the interest of saving public finances at municipal level.

Results shows that governments still struggle to accomplish their procurement goals due to noncompliance with existing public procurement policies, even though policies and support methods exist. In the survey, compliance with new National Treasury circulars and current policies was seen as a major concern, especially when procuring from supplier database. According to the Auditor-General's report of 2020/2021, meeting the elusive target requires addressing three specific issues: Mitigating inadequate consequence management that leads to excessive noncompliance and irregular expenditures (AGSA, 2017). The present procurement strategy mandates that vendors register on the central supplier database in order to supply services to the government sector, according to the South African National Treasury (2022).

The South African Municipal Systems Act (Act no. 32 OF 2000) outlines responsibilities of local municipalities in the course of providing procurement services. Independent Development Plans (IDPs) and Batho Pele Principles must be adhered to by all municipal employees in the course of rendering public procurement services. Annual assessments are conducted by the South African Auditor General (2022) to assess the level to which local municipalities do so.

2.4.1: The regulatory landscape and legal framework

Research and development regulations governing new products' safety and health, manufacturing, work safety and health regulations, pollution control, and financial regulations govern all business activities, among others. A finance regulation governing the disclosure of information, a marketing regulation governing deceptive advertising, a regulation governing pollution control, a finance regulation governing pollution control are all governed by the legal environment There are several contract-related issues that are governed by the same contract law, regardless of whether they pertain to private or public agreements. Developing and especially transitional nations with less comprehensive legal systems may require special clauses in government contracts.

The legal framework comprises documents such as the constitution, legislation, regulations, and contracts (Sayed, Hendry & Zorzin Bell, 2021: 146). A report published by the South African National Treasury (2022) has found various areas of weakness in complying with fiscal regulations and guidelines by procurement employees and officials. This shows that it is necessary to enhance the current level of adherence of procurement employees and officials to the Municipal Finance Management Act (MFMA) in local municipalities. The totality of the Procurement process was affected because of what the Supreme Court of Appeal determined to be the interconnectivity of the regulations. As a result of the regulations' content exceeding what the minister was authorised to regulate under section 5 of the Preferential Procurement Policy Framework Act, 2000 (PPPFA) and section 217 of the Constitution, the regulations were deemed unlawful. In the context of this study, the non-validity of these regulations affects all procurement above R30 000.00, VAT included. As the results, service delivery will be compromised.

Shai, Molefinyana and Quinot (2019) have identified various areas of weakness in the utilisation of municipal finances at the level of local municipalities. These weaknesses are mostly attributed to lack of auditing, accounting and bookkeeping skills and failure to enforce municipal bylaws. The authors have shown that local municipalities often struggle to use their financial resources effectively due to lack of accountability and political interference in procurement processes. The results show that governments still struggle to accomplish their procurement goals due to noncompliance with existing public procurement policies, even though policies and support methods exist. In the survey, compliance with new National Treasury circulars and current policies was seen as a major concern, in particularly when using supplier databases.

Municipal Systems Act outlines municipalities' responsibilities for providing services. The IDPs of each municipality include a description of Batho Pele policies and legislative frameworks in the form of performance management indicators (Gaffoor & Cloete, 2010:2). However, the execution of this policy framework is fraught with difficulties for municipalities nationwide according to the South African Auditor-General (2022). There is a dire need for auditing, accounting and financial skills in South African local municipalities.

2.4.2: The political landscape

During public procurement, a wide array of organisations and individuals from the private sector participate actively, including trade associations, professional associations, business firms and advocacy organisations (Spector, 2019: 126). The entities, also known as interest groups, are involved in the public procurement system in a variety of ways. They have diverse interests, goals, and beliefs. As part of this, they influence budget authorisation and appropriations procedures, lobby legislators to amend procurement statutes, and influence the implementation of these statutes (Thai, 2001). In most cases, a government program that is eventually implemented is the result of a compromise between various viewpoints held by interest groups, decision makers, and management personnel (Stumberg, & Meulen, 2019). The authors suggest that there are instances of powerful alliances between decision-makers, bureaucrats, and interest groups working to have their ideas implemented. Defense industry professionals use the iron triangle theory as a result of this alliance.

Nevertheless, the purchase stage follows the authorisation and appropriations stages of the procurement program before the iron triangle changes. Since losing or gaining significant defense contracts can have a significant impact on a company, defense-specific businesses compete for these contracts (Stoffel, Cravero, La Chima, & Quinot, 2019). In order to preserve future business competition, should several relatively weak small businesses go out of business while leaving a few defence-focused businesses to compete for contracts? In poorer nations, where ideal competition is rare, this problem is more prevalent (Dunn, 2017; Melese, 2021). It has been observed that large companies are more likely to accept slim profit margins or even financial losses in exchange for submitting the lowest bids. They will benefit from an unevenly competitive market once small and weak enterprises are forced out of existence (Dunn, 2017).

2.5. CONCEPTUAL FRAMEWORK OF STUDY

The main theory that underpins this research work is the iron triangle theory (Sheingate, 2024). The theory states that in a three-way mutually beneficial relationship, each group does what benefits the other two members of the group so that all three groups benefit by showing mutual loyalty and dedication for looking after the interest of the other two members of the triangle at all times and at all costs. Such three-way relationships create a lasting and unbreakable bond between the three members of the group. In this study, there is a 3-way relationship between local municipalities, provincial Governments, and public and private entities that render procurement and supply chain services to Steve Tshewete Municipality.

2.5.1: Prevailing market conditions

The effort made by the public procurement system to maximise competition is greatly influenced by market conditions (Berger & Roman, 2018). In addition, a government organization's ability to reach its goals, the timeliness of fulfilling them, the quality of the products and services they acquire, and the pricing of their capital assets are all determined by the market (Shai, Molefinyana & Quinot, 2019). Furthermore, it determines whether procurement targets are met in terms of socio-economic objectives. There is a great deal of market favourableness in industrialized countries, but there is a great deal of market unfavourableness in developing countries, due to the varying rates of economic growth throughout the world. The government needs some goods and services, particularly those for weapons systems, and they are readily available on the market even in a highly competitive environment (Stoffel, Cravero, La Chima & Quinot, 2019). The size and level of competition in this captive market are constrained.

Markets are becoming more globalised through regional and international trade agreements and treaties, which require modification and complexity in public procurement systems. Professionals in public procurement do in fact encounter additional difficulties, such as those relating to communication, payment and currency exchange rates, lead times, transportation, trade agreements, and customs laws (Sonnichsen, & Clement, 2020). Therefore, before starting a foreign purchase program, procurement specialists need to evaluate the total costs involved at home and compare them to those abroad. Public procurement specialists struggle with the difficult decision of whether to select domestic or foreign enterprises due to the conflicts between free trade agreements and the economies of their countries.

2.5.2: Socio-cultural changes

The majority of government entities, whether in developed or developing nations, or in the federal, state, or local governments, do not impose social policies on their public procurement, such as one that requires a fair percentage of government acquisitions to come from women- or minority-owned small businesses, by favouring domestic or local businesses over those from other nations or other geopolitical regions, they can help stabilize or develop the economy (Verma, 2015). As a result of a flawed competitive market, public procurement experts may have to deal with favourable or unfavourable environments, which effects their work in significant ways.

2.5.3: Environmental changes

There are external constraints facing procurement experts, such as environmental movements and foreign policy issues, as well as the social and economic environment ((Stoffel, Cravero, La Chima, & Quinot, 2019). Green procurement or environmental protection concern. Every nation, both established and developing, has environmental protection laws, and environmentalists have put a lot of pressure on those who work in public procurement. This kind of pressure occurs frequently and in every nation. To accomplish certain goals, many nations have utilized public procurement as a tactic in their foreign policies. For instance, the United States government refused to let Pakistan purchase 28 F-16 fighter jets in the 1980s because Pakistan was working on nuclear weapons against American preferences (Dunn, 2017; Melese, 2021). When it comes to public procurement in impoverished and weak countries, professionals usually struggle with dealing with foreign policy issues.

2.5.4: The availability of skills

A business's competitive advantages may no longer be sustained by resources that are relevant in the ever-changing business environment (Moon, Yi & Ngai, 2012:191). Many countries lack the skills required by their production sectors for a variety of reasons, but a common thread remains that their indigenous workforce has failed to be sufficiently trained to produce the skills they need (Heyns & Luke, 2012:108). Despite unemployment challenges, South Africa has a shortage of skills like many developing countries. When an individual's qualifications and skills don't match the job requirements, it poses a serious concern to the labour market. According to Zieminski (2009), due to the shortage of skilled workers, employers are looking for more specific skills. Heyns and Luke (2012:107) state that an important constraint to the expansion of businesses in South Africa is the shortage of skilled workers.

Prajogo and Sohal (2013:1534) posit that skilled resources are more important than infrastructure, information, and communication systems. Ideally, a country that is not able to create employment for its people should also not have difficulty filling critical vacancies. Skills are acquired through experience or knowledge within the workplace and are defined as the ability to perform job duties and tasks competently (Tassabehji & Moorhouse, 2008:57). Martinaitis (2014:200) has found that skills are sometimes confused with qualifications and competences. In addition to unmeasurable skills, competency is also acquired through on-the-job training (competency) and education (qualification). According to Sutherland (2012:620), qualifications are useful indicators of academic achievement and competence. Futcher, Schroder and Von Solms (2010:371) posit that competency requires the ability to meet complex requirements within a specific context, which goes beyond knowledge and skills.

Hall, Sarkani and Mazzuchi (2011:156) state that competencies include differentiated knowledge, skills, abilities, special organizational processes, and other characteristics that must be present in order to accomplish a specific task. Martinaitis (2014:200) states that superior performers exhibit 50 individual characteristics that are significantly different from average performers. These characteristics include motives, traits, self-concepts, attitudes, values, content knowledge and cognitive or behavioral skills. Heyns and Luke (2012:109) point out that South African local municipalities experience a severe lack of skills in auditing, accounting, construction, building and engineering. The authors argue that it is essential to recruit adequately trained employees from the private sector.

It is increasingly apparent that achieving a goal requires more than mastery of a few narrowly defined skills alone. South Africa's education is regulated by the South African National Department of Basic Education and the South African National Department of Higher Education and Training. Although these authorities play a significant role in closing the skills gap, not enough progress has been made so far at the level of local municipalities (Stumberg & Meulen, 2019). The authors point out that it is essential to recruit suitably skilled and experienced educators to alleviate the severe shortage of technical skills at the level of local municipalities. The authors posit that sufficient incentives should be provided to local municipalities so that they can recruit and employ suitably qualified and well experienced employees to work in local municipalities. The lack of technical skills at the level of local municipalities has increased significantly since 1994. Local municipalities have lost their skilled employees to the private sector due to various reasons. The quality of education has also decreased in the same period. As a result, South African local municipalities lack adequate skills to utilise their financial resources according to plan (Wolbers, Kuipers &

Boin, 2021: 374). The authors state that fiscal guidelines are often disregarded and stolen municipal assets are not recovered. There is a significant lack of commitment to recover stolen state assets due to lack of political commitment (Mongale, 2022).

Depending on the technology, policies, and regulations in place, a particular job may require a different set of skills as time passes. Historically, supply chain management, which evolved from tactical buyers to strategic supply chain managers, has undergone rapid changes since the 1990s (Wu, Steward & Hartley 2010:817). According to National Treasury (2015:52), Public and private sectors compete for skilled supply chain management staff, which results in lower levels of skills and knowledge in the public sector. Recruiting the right skills is difficult due to a lack of public sector attention to supply chain management; attracting qualified candidates is difficult due to a negative perception of supply chain management; and institutional cultures must change in order to attract, develop, and retain talent, as well as to offer attractive career paths. Procurement employees must have a thorough ability to conduct market research and negotiate with suppliers and producers in order to be competent enough (Mongale, 2022). Manuj and Sahin (2011:512) state that business environments rapidly change, expand, and are often uncertain, supply chain managers need to adapt and manage increasingly complex supply chains. Competitive advantage is largely attributed to supply chain management, which is responsible for the control of resources, structures, and capabilities (Mongale, 2022). Therefore, supply chain professionals need to be more flexible with all their operational activities in order to maintain a balance between their organisations' responsiveness and changing market conditions.

2.5.5: Information security

In supply chain and procurement operations, there are many paperwork requirements, which are essential for supplier communication. According to Butner (2010:24), an abundance of information, and connectivity has never been easier. In recent years, companies have provided information to investors, regulators, shareholders, and management of their businesses (Trites, 2013:2). During the public sector supply chain management process, public sector organizations are required to provide information according to transparency and ethical standards, for example: no suppliers will be given the same information before or during the tendering process at the same time (South African National Treasury, 2022). An important aspect of procurement is the management, measurement, and control of information. Despite the fact that even the most skilled and qualified organizations may be able to manage and implement even the best-designed procurement processes effectively, they may also have difficulty implementing even the most comprehensive and aligned procurement-related strategic plans and policies if they lack adequate information (APICS, 2016:16). According to the South African National Treasury (2022), the public has the right to access information about supply chains in the public sector, and it should be made readily available. A variety of information is provided on supply chain management, from government plans to practice notes about legislation.

The accuracy and completeness of information are crucial in public sector supply chain management. As policymakers design supply chain management processes, security is a critically important consideration. In the absence of security, supply chain management processes will be unlikely to succeed. According to Sindhuja and Kunnathur (2015:481), it is essential for supply chains to be interconnected and integrated with communication networks. In addition to suggesting that information security cannot be implemented only through technological tools, the author also argues that effective organization-wide information security is determined by three factors: a strong team, a structured process, and a technology-based approach (Moshtari, Altay, Heikkila & Goncalves, 2021). A number of information-handling activities are involved in providing coordination and collaboration between supply chain partners, and they rely heavily on information systems to do so (Sindhuja & Kunnathur, 2015:477). Procurement employees and officials must possess adequate skills in the use of digital and electronic systems and applications including the internet. They need to possess adequate skills in the use of digital and online methods of conducting market research and looking for products, goods and services. They also need to have good skills in verifying the accuracy and completeness of market related information in real time.

2.6. CHAPTER SUMMARY

Chapter 2 has provided a detailed and structured summary of the relevant literature on public sector procurement. The review is relevant to performance requirements at municipal level. The chapter has provided an overview of procurement processes followed at Steve Tshwete Local Municipality (STLM) in Mpumalanga province. The review has covered aspects of procurement services that are integral to municipal service delivery. Problems and basic operational needs are covered in the summary. A critical review of the literature has been provided on the pervasive nature of organisational procurement strategies and its overarching implications on efficient public supply chain management. Two fundamental procurement theories namely utilitarian theory and virtue theory are explored and whilst they may be linked to each other, their differences are distinct, and each plays a different role in explaining public procurement practices and strategies. Additionally, the literature review offers insight on some of the findings brought forth in prior studies that assessed the challenges faced by public institutions, highlighting challenges resulting from both internal and external factors. The works examined in the study are elaborately discussed and contextualised in terms of how public institutions are challenged by various factors when it comes to procurement and procurement practices, including financial literacy, perceptions of risk, risk appetite, competition between employees, technological advances, socioeconomic changes, market conditions, and regulatory landscapes, among others. Although the studies provide different viewpoints with some evidencing positive associations, some negative associations and in some cases, no relationships at all, there is an unmistakable view shared by the majority of the scholars in relation to the underlying factors that contribute to the challenges faced by public institutions insofar as procurement strategies and practices go.

CHAPTER 3: METHODS AND MATERIALS OF STUDY

3.1: INTRODUCTION

Chapter 3 gives an explanation about technical methods used for producing empirical or scientific evidence in the research carried out. This is mostly about what study design was used, what the size of the population was, what the size of the sample was, how eligible respondents were selected from the population of study into the sample of study, what statistical methods of data analyses were used in the study, and how interpretations of results of data analyses were made. The chapter also shows how the precise measurement of variables was ascertained in the course of conducting the research work.

3.2: STUDY DESIGN AND RESEARCH APPROACH

The study was quantitative in nature and was conducted by using positivism and deductive reasoning (Creswell, 2021). Positivism and deductive reasoning allow the researcher to test the validity of assumptions by gathering empirical data from the field. Rahman (2016:53) informs us that a research design explains the purpose of research, expected outcomes of research, and the methods to be used for achieving the intended outcomes of research. The research design outlines how the information will be collected and evaluated (Addo, 2019:65). This study adopts a cross-sectional research approach. A descriptive design will be used to collect quantitative data on the procurement challenges facing municipalities in South Africa. According to Babbie (2016:1), descriptive and cross-sectional research methods can be used since the purpose of the study is to observe how procurement challenges affect the efficiency of the procurement process. To establish variable relatedness, temporality, reject alternative hypotheses, and offer premise, a cross-sectional design is used. Quantitative tools are appropriate for conducting exploratory research. Examples of such methods are frequency tables, bar charts, pie charts, cross tabulated tests and exploratory and exploratory factor analysis (Spector, 2019: 128).

3.3: SAMPLE SIZE OF STUDY

The sample size of study was 147 employees of Steve Tshwete Local Municipality (STLM). The total number of employees in the municipality was 270 (Steve Tshwete Local Municipality, 2021). From among these 270 employees, it was only possible to gather data from 147 eligible employees of the local municipality. Thus, the sample size of study was equal to 147 employees of STLM.

The population is the constituents that meet the requirements of the researcher to attain findings that concern those elements (Ravitch & Carl, 2017). Steve Tshwete Local Municipality employs 270 employees which are involved in procurement from Executive Directors to Admin Clerks (Steve Tshwete Local Municipality, 2021). Thus, the population size of the study is 270 employees of the municipality.

3.4: SAMPLING TECHNIQUE

Data was collected from 147 eligible employees of Steve Tshwete Local Municipality (STLM). Stratified random sampling (Levy and Lemeshow, 2013) was used for selecting 147 eligible participants of research at the local municipality. Stratification was carried out by level of seniority. Three strata (high, middle level and low) were used for classification. The list of all 270 eligible employees of the local municipality was obtained from the Human Resources Department of the local municipality. From the list, a stratified random sample of size 147 employees working on procurement and supply chain management services was chosen.

Levels of seniority and job categories are commonly used for stratification in socioeconomic, demographic and management studies (Hair Jr, Page, & Brunsveld, 2019; Silvia, 2020). In this research, eligible employees included procurement employees, supply chain management employees, managers, administrators, clerks and low-level administrative assistants. The ranks of eligible employees include Executive Directors, Directors, Deputy Directors, Assistant Directors, Supervisors and Practitioners.

3.5: DATA COLLECTION

In this study, a questionnaire was used as the key instrument for gathering primary data. According to Silverman (2013), primary data is real time data collected specifically for a particular purpose directly, from the relevant source. Measurement was taken by using a 5-point ordinal scale or a Likert-style scale. According to Bertram (2012), the use of a 5-point ordinal or Likert scale is helpful for measuring the degree of compliance with stipulated procedures and guidelines in areas related to procurement and supply chain management. The questions to be used in the study are close ended. Quantitative studies generally use structured interviews and a questionnaire with closed questions (Bryman, & Bell, 2011:27). The questionnaire was created from existing questionnaires, and the questions were revised to fit the needs of this research.

The questionnaire of study is an adaptation of questionnaires developed by Heiskanen (2018). The dependent variable of study is the extent to which employees adhere to best practice in procurement processes. The level of performance of employees was assessed by using a composite index developed by Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029).

Data was gathered by using a structured questionnaire of study. The use of a questionnaire will help the researcher to collect data from all eligible participants of study easily. Furthermore, it encourages openness when responding to sensitive questions. A number of close-ended (structured) questions will be used in the questionnaire of study. Data was collected by using the online data collection software SurveyMonkey to ensure a speedy and reliable data collection from all eligible participants of study.

3.6: LIST OF VARIABLES OF STUDY

Data was collected from each one of the 147 respondents who took part in the study on one dependent variable of study (the extent to which employees adhere to best practice in procurement processes) and 58 socioeconomic factors or independent variables of study. The 58 independent variables of study affect the effective utilisation of procurement processes at Steve Tshwete Municipality (STM). The questionnaire of study (Appendix A) shows the list of all variables of study. The questionnaire of study was validated by conducting a pilot study. This was done by administering the questionnaire of study to a random sample of size 10 eligible participants of research at the local municipality. The pilot study showed that it was necessary to amend a few questions of study. A pilot study is commonly used in socioeconomic surveys for ensuring content validity by testing questionnaires in the field (Creswell, 2021).

Dependent variable of study (Y)

The dependent variable of study (Y) was the ability of employees working at Steve Tshwete Local Municipality (STLM) to render effective procurement services at Steve Tshwete Local Municipality (STLM). The variable Y is dichotomous, and can only have 2 possible values (Yes, No).

Y: The ability of employees working at Steve Tshwete Local Municipality (STLM) to render effective procurement services (Yes, No)

Variable Y was created by assessing the ability of employees working at Steve Tshwete Local Municipality (STLM) to render effective procurement services on a regular basis for each one of the 147 participants of research. The level of performance of employees was assessed by using a composite index developed by Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029).

Independent or explanatory variables of study ($X_1, X_2, ..., X_k$)

- Gender of employee
- Age of employee
- Position of employee at Steve Tshwete Municipality
- Highest level of formal education
- Term of employment at municipality

- Awareness about procurement policy at municipality
- Level of knowledge about challenges that are related to procurement services
- Knowledge about the implementation of procurement policy
- Knowledge about manner in which procurement policy is implemented
- Adherence to guidelines stipulated by the South African National Treasury
- Adherence to guidelines stipulated in the South African Constitution
- Extent to which the procurement policy is reviewed frequently
- Extent to which the procurement policy covers all aspects of procurement
- Extent to which all employees are made aware of changes in procurement policy
- Knowledge of administrative challenges to procurement activities
- Knowledge of availability of enough budget for procurement services
- Knowledge of alignment of procurement plan to municipal budget
- Knowledge of training needs of employees on procurement activities
- Knowledge of local best practice about procurement services and activities
- Knowledge of international best practice about procurement services and activities
- Knowledge of technical skills that affect the quality of procurement activities
- Knowledge of leadership skills that affect the quality of procurement services
- Knowledge of management skills that affect the quality of procurement services
- Knowledge of electronic methods of rendering procurement services
- Knowledge of ethical aspects of procurement services
- Knowledge of professional aspects of procurement services

Appendix A shows all sections of the questionnaire of study.

3.7: VALIDITY AND RELIABILITY TESTS

To ensure the validity of the questionnaire guide, a questionnaire of this study will be derived from existing knowledge. Validity is used to ensure consistency between what needs to be gathered and what the questionnaire of study achieves (Mohajan, 2018). A pilot study will be conducted to test the questionnaire of study in the field before actual data collection commences. Doing so is helpful for ensuring content validity (Almanasreh, Moles & Chen, 2022). Reliability and internal consistency will be ensured by estimating Cronbach Alpha coefficients for influential variables of study (Bryman & Bell, 2011). Cronbach Alpha coefficients that have magnitudes larger than 0.75 indicate that there is adequate reliability and internal consistency in the measurement tools used for gathering data (Hair Jr, Page & Brunsveld, 2019).

3.8: METHODS OF DATA ANALYSES

Data capturing and editing was carried out by using an Excel software. This process was valuable for capturing and editing data without introducing error. The raw data set had information gathered from 147 participants of study. Data analysis was carried out in sequential steps. First, univariate analysis was carried out for each variable of study. This process enabled the researcher to obtain frequency tables, percentages, pie charts and bar charts. Secondly, bivariate analysis was carried out for pairs of categorical variables. This process was helpful for identifying variables that are associated with the ability of employees to render quality procurement services in the local municipality. Thirdly, factors that are useful determinants were used for performing exploratory factor analysis based on results obtained from bivariate analysis. This sequential approach is highly recommended and commonly used for performing data analysis in management and social science studies (Leedy, *et al*., 2019; Hair Jr, Page, & Brunsveld, 2019).

According to Watkins (2018) and Bryman and Bell (2011), methods such as pie charts, bar charts, frequency tables, crosstab analyses, and exploratory factor analysis (EFA) are suitable for identifying variables that are influential predictors. The dependent variable of study is the extent to which employees adhere to best practice in procurement processes and supply chain management. The level of performance of employees was assessed by using a composite index developed by Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029). Watkins (2018: 219-246) recommends that taking 20 or more observations per variable of study yields reliable estimates in exploratory factor analysis. In this study, exploratory factor analysis was performed by taking 5 variables of study, with a sample of size of 147. According to Watkins (2018), the sample size of study (n=147) is large enough for performing exploratory factor analysis.

Goodness-of-fit tests

All estimated results of data analyses were tested by using standard goodness-of-fit tests (Hair Jr, Page & Brunsveld, 2019). Goodness-of-fit tests are essential for obtaining reliable estimates of data analysis. Objectivity was ensured during the study with a view to obtain realistic answers to questions. Doing so is valuable for minimising bias (Almanasreh, Moles & Chen, 2022) as the positivist paradigm was used for conducting the research. According to Ran and Qi (2016:347), social science is characterised by theories before empirical research. Statistical reasoning justifies findings from empirically testable speculations. This was achieved by using appropriate statistical tests. The various sets of results estimated from the analysis of raw data sets were tested and evaluated for reliability by using appropriate goodness-of-fit tests. Results obtained from goodness-of-fit tests confirmed the reliability of estimated results.

3.9: ETHICAL CONSIDERATIONS

The researcher is an employee of Steve Tshwete Local Municipality (STLM). The researcher understands the confidentiality and importance of study. All aspects of confidentiality and anonymity were ensured by the researcher during the study. Participants who chose to participate in the study did so voluntarily and gave consent to that effect before data was gathered. Ethics approval was granted for the research from the Research Ethics Committee of Tshwane University of Technology (TUT) in Pretoria.

During data gathering, eligible participants of the study were given codes (A, B, etc) in order to ensure anonymity. Direct names of participants were not used. Instead, participants were addressed as "participant A”, “Participant B”, etc. All participants of research were informed about their right to drop out of the study at any time of their choice without having to explain the reason why. Participants were provided with a quiet and private environment in which they were free to complete the questionnaire of study with no interference.

CHAPTER 4: RESULTS OF DATA ANALYSES

4.1: INTRODUCTION

This chapter presents results from frequency tables, pie charts, bar charts, two-by-two Pearson's chi-square tests of associations, Cronbach Alpha coefficients, and exploratory factor analysis. Interpretations of results of data analyses will also be provided.

4.2. RESULTS FROM FREQUENCY TABLES

Table 4.2.1 shows frequency counts and percentages for the dependent variable of study. The table shows that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029). The table shows that the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards.

Table 4.2.1: Assessment of the performance of procurement employees (n=147)

Quality of procurement services	Number	Percentage
Adequate	133	90.48%
Inadequate	14	9.52%
Total	147	100.00%

Figure 4.2.1 shows a pie chart for the level of performance of the 147 participants who were chosen for the research. The pie chart shows that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards.

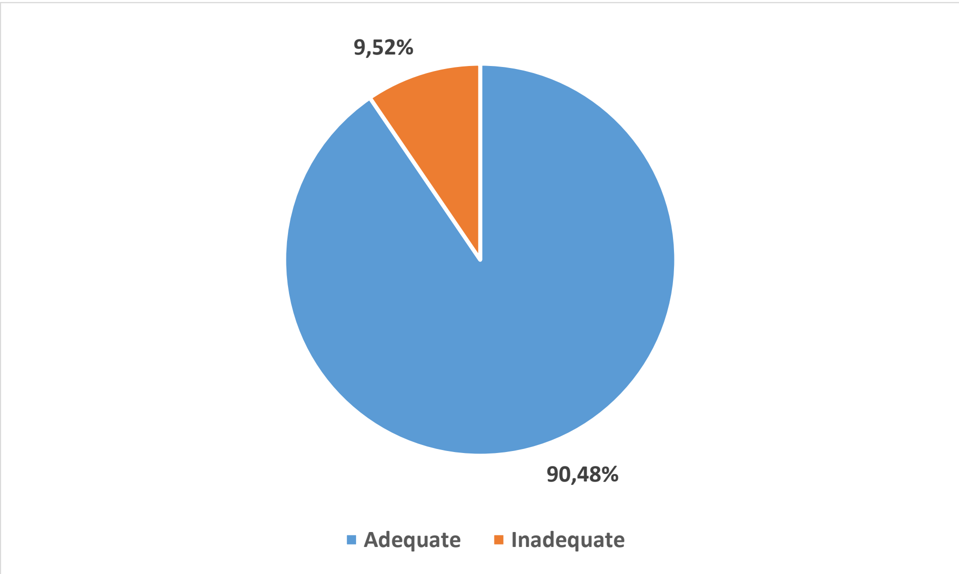

Figure 4.2.1: Level of performance of procurement employees

Table 4.2.2 shows frequency counts and percentages for socioeconomic characteristics of respondents. Female participants accounted for 42.18% of participants, male participants accounted for 52.38%, and others accounted for 5.44%. Participants with ages of 21 to 30 years made up 10.20% of participants. The corresponding figure for participants with ages of 31 to 40 years was 46.26%. The corresponding figure for participants with ages of 41 to 50 years was 31.97%. The corresponding figure for participants with ages of 51 to 60 years was 11.56%.

Table 4.2.2: Gender and age distribution of participants of research (n=147)

Gender of participant	Number	Percentage
Female	62	42.18
Male	77	52.38
Other	8	5.44
Age in years	Number	Percentage
21 to 30	15	10.20
31 to 40	68	46.26
41 to 50	47	31.97
51 to 60	17	11.56

Figure 4.2.2 shows a pie chart for the gender of participants. Male participants accounted for 52.38%; female participants accounted for 42.18%; and other participants accounted for 5.44%.

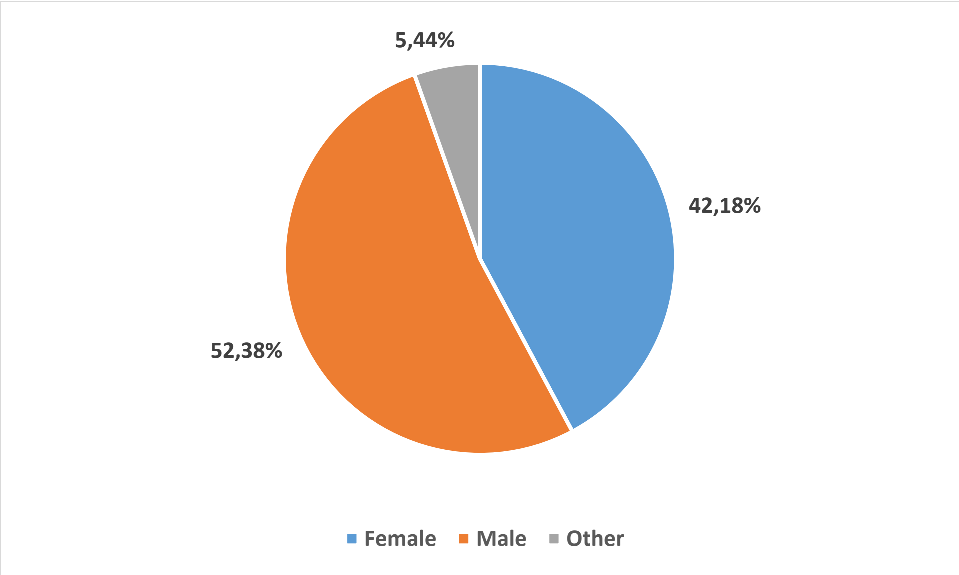

Figure 4.2.2: Gender of participants

Figure 4.2.3 shows the ages of participants of research Participants with ages of 21 to 30 years made up 10.20% of participants. The corresponding figure for participants with ages of 31 to 40 years was 46.26%. The corresponding figure for participants with ages of 41 to 50 years was 31.97%. The corresponding figure for participants with ages of 51 to 60 years was 11.56%.

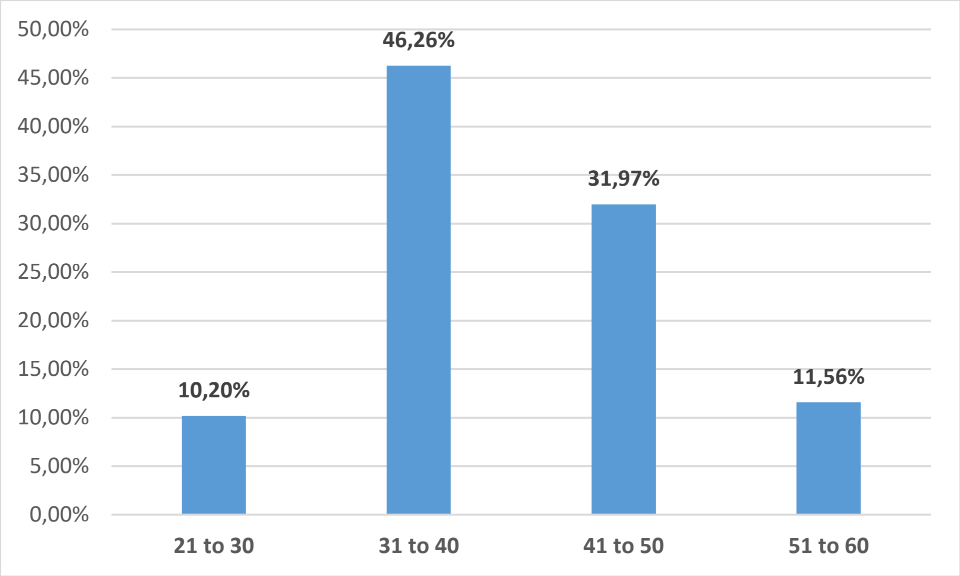

Figure 4.2.3: Ages of participants

Table 4.2.3 shows the job categories of the 147 participants of research. The table shows that administrators accounted for 29.33% of participants; Assistant Directors accounted for 17.01% of participants; Deputy Directors accounted for 12.24%; Clerks accounted for 10.88%; and Directors accounted for 8.84%.

Table 4.2.3: Job categories of participants of research (n=147)

Job category	Number	Percentage
Accountant	1	0.68%
Administrator	44	29.93%
Assistant Director	25	17.01%
Buyer	2	1.36%
Clerk	16	10.88%

Deputy Director	18	12.24%
Director	13	8.84%
Environmental officer	1	0.68%
Executive Director	4	2.72%
Horticulturalist	1	0.68%
Intern	3	2.04%
Municipal manager	1	0.68%
Network administrator	1	0.68%
Other	7	4.76%
Procurement practitioner	1	0.68%
SCM practitioner	1	0.68%
Senior technician	1	0.68%
Sub-accountant	1	0.68%
Technical assistant	5	3.40%
Town planner	1	0.68%
Total	147	100%

Table 4.2.4 shows a frequency distribution for the highest level of formal education and employment duration of participants. NQF level 1 accounts for less than 1 percent (0.68%). NQF

Level 5 accounted for 5.44%. NQF Level 6 accounted for 27.89%. NQF Level 7 accounted for 32.65%. NQF Level 8 accounted for 23.13%. NQF Level 9 accounted for 10.20%.

Employees who served for 1 to 5 years accounted for 27.21%; Employees who served for 6 to 10 years accounted for 35.37%; Employees who served for 11 to 15 years accounted for 17.01%; Employees who served for 16 to 20 years accounted for 12.93%; Employees who served for 21 years or more accounted for 3.40%.

Table 4.2.4: Level of education and employment duration (n=147)

Highest level of formal education of participant	Number	Percentage
NQF Level 4	1	0.68
NQF Level 5	8	5.44
NQF Level 6	41	27.89
NQF Level 7	48	32.65
NQF Level 8	34	23.13
NQF Level 9	15	10.20
Duration of employment in years	Number	Percentage
1 to 5	40	27.21
6 to 10	52	35.37
11 to 15	25	17.01
16 to 20	19	12.93
21 years or more	5	3.40

Figure 4.2.4 shows a bar chart for the highest level of formal education and employment duration of participants. NQF level 1 accounts for less than 1 percent (0.68%). NQF Level 5 accounted for 5.44%. NQF Level 6 accounted for 27.89%. NQF Level 7 accounted for 32.65%. NQF Level 8 accounted for 23.13%. NQF Level 9 accounted for 10.20%.

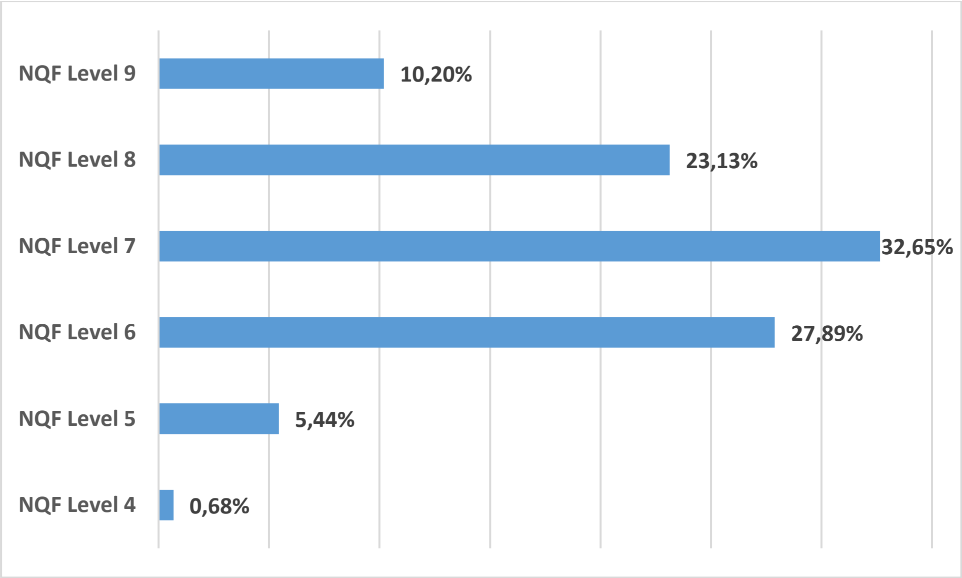

Figure 4.2.4: A bar chart for the highest level of formal education of participants

Figure 4.2.5 shows a bar chart for the number of years of service of employees who participated in the research. Employees who served for 1 to 5 years accounted for 27.21%; Employees who served for 6 to 10 years accounted for 35.37%; Employees who served for 11 to 15 years accounted for 17.01%; Employees who served for 16 to 20 years accounted for 12.93%; Employees who served for 21 years or more accounted for 3.40%.

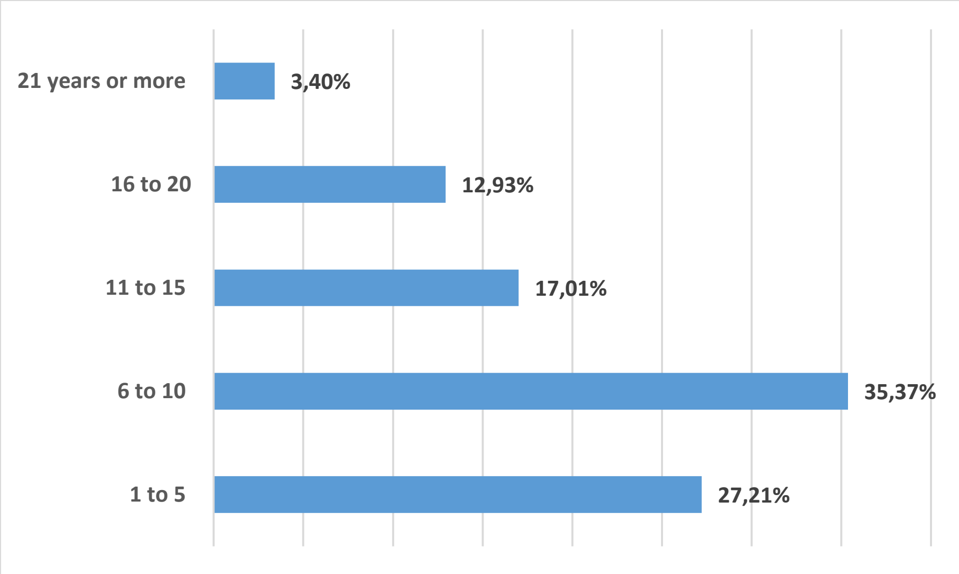

Figure 4.2.5: A bar chart for the length of employment of participants

Table 4.2.5 shows percentages for indicators of satisfactory compliance with legislative requirements. The results show that 91.84% of participants believe that the procurement policy of STLM is in line with National Treasury guidelines and the South African Constitution. Just under 83% of participants believe that the procurement policy of STLM is frequently reviewed. Just under 82% of participants believe that the policy covers all aspects of procurement. Just above 80% of participants believe that employees are regularly made aware of changes in procurement policy. These estimates indicate that there is adequate compliance with legislative requirements in the local municipality. Similar estimates have been reported in the literature by Ye, Suleiman and

Huo (2022) and Abutabenjeh (2021). The authors have used a similar set of performance monitoring indicators for procurement employees.

Table 4.2.5: Level of compliance with legislative requirements (n=147)

Legislative requirements	Yes	No	Do not know
The procurement policy of STLM is in line with National Treasury guidelines and the South African Constitution	91.84%	2.72%	5.44%
The procurement policy of STLM is frequently reviewed	82.99%	6.80%	10.20%
The policy covers all aspects of procurement	81.63%	10.88%	7.48%
Employees are regularly made aware of changes in procurement policy	80.27%	14.29%	5.44%

Table 4.2.6 shows percentages for the level of perceived challenges among procurement employees and their line function managers. The results show that procurement employees and their line function managers are capable of coping with all perceived challenges. The results show that 82.31% of participants believe that the procurement of goods and services at the STLM is adequately budgeted for in advance; 88.43% of participants believe that the STLM budget is aligned with its procurement plan; 75.51% of participants believe that end users' requisitions are planned by the STLM's procurement unit; 74.15% of participants believe that each end user of the STLM prepares a multi annual work plan based on the approved budget; 82.31% of participants believe that procurement officials of STLM are adequately trained to prepare specification as per requisitions; 83.67% of participants believe that procurement personnel are privy to the budget as per procurement procedure; 75.51% of participants believe that lack of official procurement

training lead to poor procurement performance of STLM; 76.19% of participants believe that uncoordinated procurement processes lead to poor procurement performance of STLM; 70.06% of participants believe that lack of adequate training of STLM procurement officials on public sector procurement legislation lead to unqualified audits; and that 88.44% of participants believe that adequate training of STLM procurement officials on public sector procurement legislation can improve service delivery. The above figures are in line with estimates reported in the literature by Addo (2019) for a study carried out in Ghana and Ababio, Vyas-Doorgapersad and Mzini (2019).

Table 4.2.6: Assessment of perceived challenges in procurement (n=147)

Perceived challenges	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The procurement of goods and services at the STLM is adequately budgeted for in advance.	0.68%	3.40%	13.61%	56.46%	25.85%
The STLM budget is aligned with its procurement plan.	0.68%	1.36%	9.52%	48.98%	39.45%
End users' requisitions are planned by the STLM's procurement unit.	2.72%	5.44%	16.33%	28.57%	46.94%
Each end user of the STLM prepares a multi annual work plan based on the approved budget.	1.36%	5.44%	19.05%	50.34%	23.81%
Procurement officials of STLM are adequately trained to prepare specification as per requisitions.	0.68%	3.40%	13.61%	48.98%	33.33%
Procurement personnel are privy to the budget as per procurement procedure.	0.68%	0.68%	14.97%	46.26%	37.41%

Lack of official procurement training lead to poor procurement performance of STLM.	2.04%	6.80%	15.65%	34.01%	41.50%
Uncoordinated procurement processes lead to poor procurement performance of STLM.	2.72%	6.12%	14.97%	38.78%	37.41%
Lack of adequate training of STLM procurement officials on public sector procurement legislation lead to unqualified audits.	5.44%	8.16%	16.33%	31.29%	38.77%
Adequate training of STLM procurement officials on public sector procurement legislation can improve service delivery.	0.68%	0.00%	10.88%	42.86%	45.58%

Table 4.2.7 shows percentages for the level of perceived technological challenges among procurement employees and their line function managers. The results show that 18.37% of participants believe that STLM staff are inadequately prepared to work with the electronic public procurement system; 57.82% of participants believe that STLM staff are inadequately prepared to work with the IT systems that can be used to enhance procurement; 59.18% of participants believe that STLM staff are inadequately skilled in using the Information and Communication Technology (ICT) system; 61.9% of participants believe that there are technical challenges in ICT hardware of STLM that hinder the procurement processes; and that 56.46% of participants believe that the

procurement IT system of STLM is integrated with other units within the municipality. These figures are similar to those estimated in the past by Verma (2015) and Speranza (2018).

Table 4.2.7: Assessment of perceived technological challenges in procurement (n=147)

Perceived technological challenges	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
STLM is not well equipped in terms of systems software infrastructure.	13.61%	16.33%	11.56%	40.14%	18.37%
The STLM staff is inadequately prepared to work with the electronic public procurement system.	8.84%	17.01%	16.33%	17.01%	31.29%
The STLM staff is inadequately prepared to work with the IT systems that can be used to enhance procurement.	10.88%	14.97%	14.97%	30.61%	28.57%
The STLM staff is inadequately skilled in using the Information and Communication Technology (ICT) system.	10.88%	14.29%	12.93%	34.59%	27.21%

There are technical challenges in ICT hardware of STLM that hinder the procurement processes.	10.20%	14.97%	18.37%	31.29%	25.17%
Procurement IT system of STLM is integrated with other units within the municipality.	1.36%	5.44%	17.69%	42.86%	32.65%

Table 4.2.8 shows percentages for the level of perceived leadership challenges among procurement employees and their line function managers. The results show that 70.07% of participants believe that poor procurement leadership contributes to poor performance; 58.50% of participants believe that lack of transparency from procurement leaders in conducting STLM activities contributes to poor performance; 83.67% of participants believe that poor procurement leadership affects staff enthusiasm; 78.91% of participants believe that lack of leadership to deal with corruption in the procurement process demoralise the procurement staff; 63.26% of participants believe that lack of proper articulation of procurement legislation by procurement leaders confuses the staff; 79.60%

of participants believe that conflict of interest contributes to corruption; and that 72.79% of participants believe that lack of formal procurement reporting structures leads to confusion among the staff. The estimates obtained are similar to those reported in the literature by Azanlerigu and Akay (2015) and Badi and Murtagh (2019).

Table 4.2.8: Assessment of perceived leadership challenges in procurement (n=147)

Perceived leadership challenges	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Poor procurement leadership in the STLM contributes to poor performance.	4.76%	8.84%	16.33%	44.90%	25.17%
Lack of transparency from procurement leaders in conducting STLM activities contributes to poor performance	7.48%	16.33%	17.69%	31.29%	27.21%
Poor procurement leadership affects staff enthusiasm	2.72%	2.72%	10.88%	44.22%	39.45%
Lack of leadership to deal with corruption in the procurement process demoralise the procurement staff	1.36%	8.84%	10.88%	45.58%	33.33%
Lack of proper articulation of procurement legislation by procurement leaders confuses					

the staff	5.44%	16.33%	14.97%	27.89%	35.37%
Conflict of interest contributes to corruption	0.68%	3.40%	16.33%	39.46%	40.14%
Lack of formal procurement reporting structure leads to confusion among the staff	2.04%	7.48%	17.69%	43.54%	29.25%

Table 4.2.9 shows percentages for the level of perceived economic challenges among procurement employees and their line function managers. The results show that 65.99% of participants believe that the operating costs of STLM have decreased since electronic methods of procurement were introduced; 66.67% of participants believe that there are economic challenges related to sourcing for clients using the Central Supplier Database at the STLM; and that 67.34% of participants believe that there are financial challenges that hinder procurement services at the STLM. The

figures estimated are similar to those reported in the literature by Badi and Murtagh (2019) and Ganesh Kumar and Nambirajan (2014).

Table 4.2.9: Assessment of perceived economic challenges in procurement (n=147)

Perceived economic challenges	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The operating costs of STLM have decreased since the inception of electronic features (i.e., Central Supplier Database and e-Tender publishing portal).	0.68%	8.84%	24.49%	46.94%	19.05%
There are economic challenges related to sourcing for clients using the Central Supplier Database at the STLM.	2.72%	10.20%	20.41%	38.78%	27.89%
There are financial challenges that hinder procurement service at STLM	3.40%	10.20%	19.05%	36.73%	30.61%

Figure 4.2.6 shows a bar chart for the perception held by participants about the extent to which the values of good governance were understood by procurement officials working in the local municipality. The bar chart shows that 76.19% of participants believed that the values of good governance were understood well enough by STLM procurement officials.

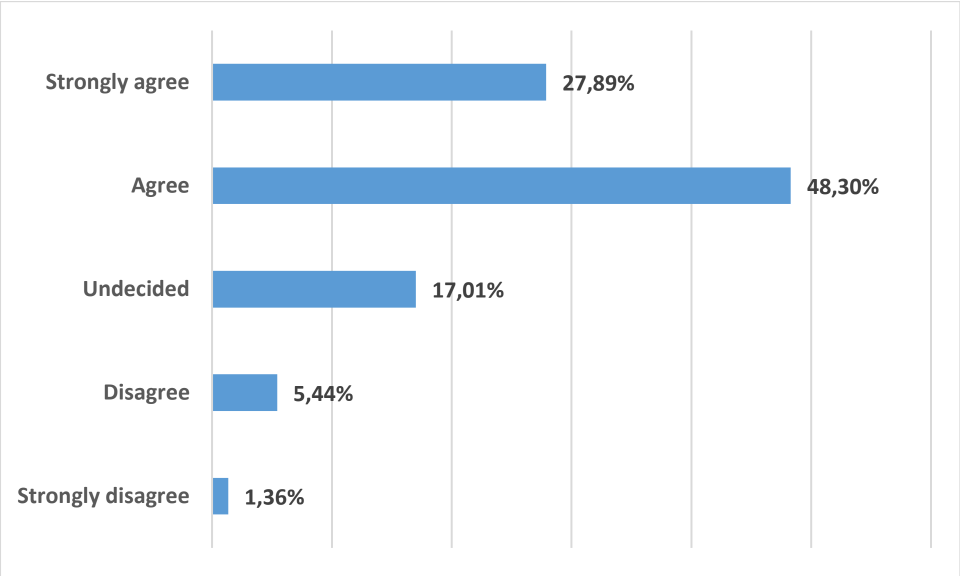

Figure 4.2.6: Perceived level of understanding of values of good governance

Figure 4.2.7 shows a bar chart for the perception held by participants about the level of adherence with ethical guidelines among STLM procurement officials. The bar chart shows that 79.59% of participants believed that the level of adherence to ethical guidelines among STLM employees was good enough.

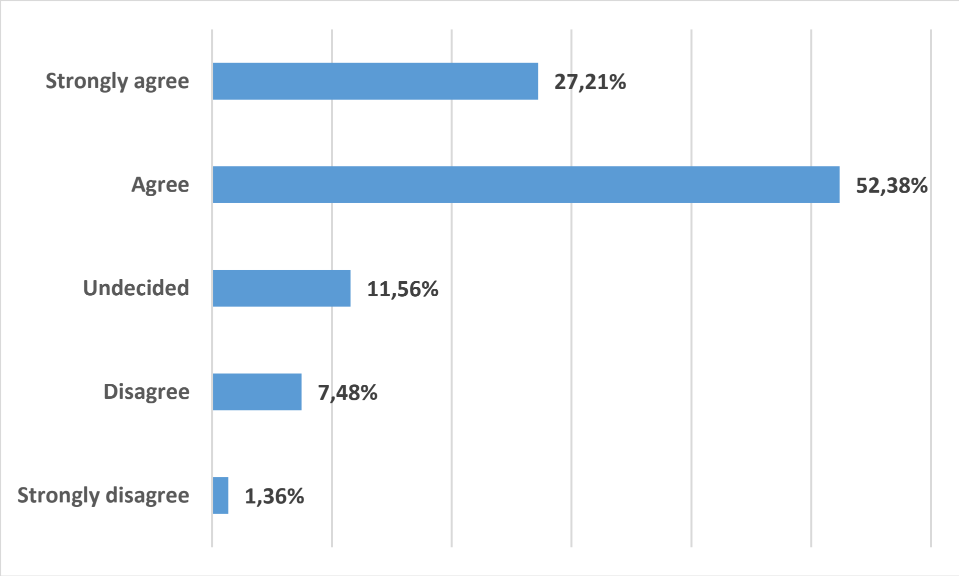

Figure 4.2.7: Perceived level of adherence with ethical guidelines

Figure 4.2.8 shows a bar chart for the perception held by participants about the extent to which procurement employees are consulted before decisions are taken by the top leadership of the local municipality. The bar chart shows that 63.94% of participants believed that enough consultation was made with procurement employees and officials by the top leadership of the local municipality before decisions were taken.

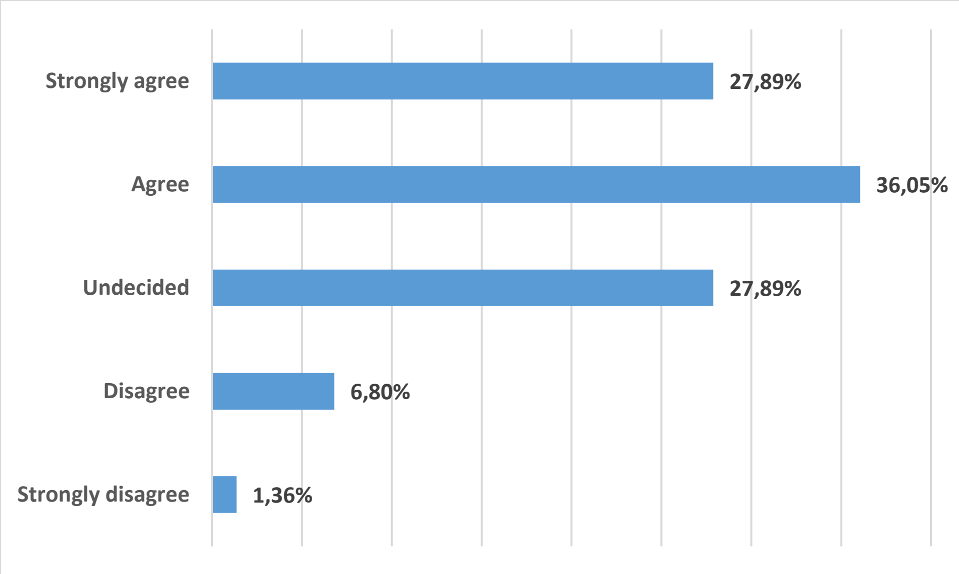

Figure 4.2.8: Perceived level of consultation with procurement employees

Table 4.2.10 shows percentages for the level of perceived leadership and governance related challenges that undermine the quality of procurement services that are performed by procurement employees and their line function managers at STLM. The results show that 87.07% of participants believed that the STLM communicates its procurement approach to governance to all employees well enough; 82.99% of participants believed that the STLM's approach to governance was communicated to all stakeholders; 76.19% of participants believed that the value of good governance is understood by all the procurement officials of the STLM; 79.59% of participants believed that there was a general high level of adherence to general ethical standards within the STLM; 89.79% of participants believed that good governance enhances ethical leadership implemented by the STLM council through providing strategic direction; and that 63.94% of participants believed that procurement employees were fully consulted when decisions were taken.

The results show that 72.79% of participants believed that the roles of procurement officials were thoroughly explained and stated in a written document; 76.03% of participants believed that STLM encourages procurement officials to attend professional procurement training programs relevant to their position; 68.03% of participants believed that the performance evaluation process followed in the local municipality showed the level of commitment of each procurement official well enough; 70.06% of participants believed that the evaluation of employees was performed on a regular basis; 71.43% of participants believed that the management of the municipality ensured the availability of a sound system of internal control to safeguard the interest of members; 73.47% of participants believed that STLM procurement officials complied with all the relevant laws, regulations, and best practice codes; 71.43% of participants believed that STLM procurement management ensured the availability of relevant procurement procedures to penalise misconduct by procurement officials; and that 73.47% of participants believed that there was a direct communication channel between procurement management members and their subordinates.

The results show that 71.43% of participants believed that procurement policies and decisions were regularly communicated to procurement officials; 75.51% of participants believed that the management of the municipality shared relevant information regarding procurement performance with other stakeholders on a regular basis; 76.19% of participants believed that the local municipality had existing procurement mechanisms to deal with perceived conflicts of interest; 74.14% of participants believed that all procurement officials were involved when decisions were made; 70.75% of participants believed that all procurement officials were treated equally; and that 62.58% of participants believed that enough support was provided by the management of the local municipality to procurement employees and officials to execute their duties well enough.

The figures estimated above are similar to figures estimated in the past by Anane, Adoma and Awuah (2019) in Ghana. Similar figures have also been reported by Dzuke and Naude (2015) based on a survey conducted in Zimbabwe.

Table 4.2.10: Assessment of leadership and governance related challenges (n=147)

Perceived economic challenges	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The STLM’s approach to governance is communicated to all employees.	0.00%	5.44%	7.48%	58.50%	28.57%
The STLM’s approach to governance is communicated to all stakeholders.	0.68%	3.40%	12.93%	44.90%	38.09%
The value of good governance is understood by all the procurement officials of the STLM.	1.36%	5.44%	17.01%	46.94%	27.89%

There is a general high level of adherence to general ethical standards within the STLM.	1.36%	7.48%	11.56%	52.38%	27.21%
I believe a good governance system will enhance the ethical leadership implemented by the STLM council through providing strategic direction.	0.68%	0.68%	8.84%	50.34%	39.45%
The procurement staff members are fully consulted when decision are taken.	1.36%	6.80%	27.89%	36.05%	27.89%
Roles of procurement officials have been thoroughly explained and stated in a written document.	1.36%	4.76%	21.09%	47.62%	25.17%

STLM encourages procurement officials to attend professional procurement training programs relevant to their position.	0.68%	3.42%	19.86%	38.36%	37.67%
The performance evaluation is sufficient to show whether each procurement officials associated with the municipality continues to demonstrate commitment to their respective role.	0.00%	9.52%	22.45%	44.90%	23.13%
The evaluation of the employees is performed on a regular basis.	2.04%	9.52%	18.37%	37.41%	32.65%
The municipality management ensures that a sound system of internal control to safeguard members' interests.	0.68%	7.48%	20.41%	45.58%	25.85%
STLM procurement officials comply with all the relevant laws, regulations, and best	1.36%	7.48%	17.69%	40.82%	32.65%

practice codes.					
STLM procurement management ensures that relevant procurement procedures are in place to penalise misconduct by procurement officials.	2.04%	7.48%	19.05%	44.22%	27.21%
A direct communication channel exists between the procurement management and subordinates at STLM.	1.36%	4.76%	18.37%	45.58%	29.93%
STLM procurement manager ensures that procurement policies and decisions, are regularly communicated to procurement officials.	2.72%	2.04%	19.05%	44.22%	31.97%
The municipality management shares relevant information regarding procurement performance with other stakeholders on a regular basis.	2.04%	4.76%	19.05%	36.05%	38.09%

STLM has existing procurement mechanisms to deal with perceived conflicts of interest.	1.36%	4.08%	23.81%	42.86%	27.89%
All procurement officials are involved when decisions are made.	2.72%	12.93%	21.77%	32.65%	29.93%
All procurement officials are treated equally.	3.40%	6.12%	25.17%	38.78%	26.53%
The procurement management supports its procurement officials in the execution of their duties.	0.00%	1.36%	21.77%	44.22%	32.65%

Figure 4.2.9 shows a bar chart for the perception held by participants about the extent to which STLM encourages procurement officials to attend professional procurement training programmes relevant to their position. The bar chart shows that 76.03% of participants believed that the level of support provided was good enough.

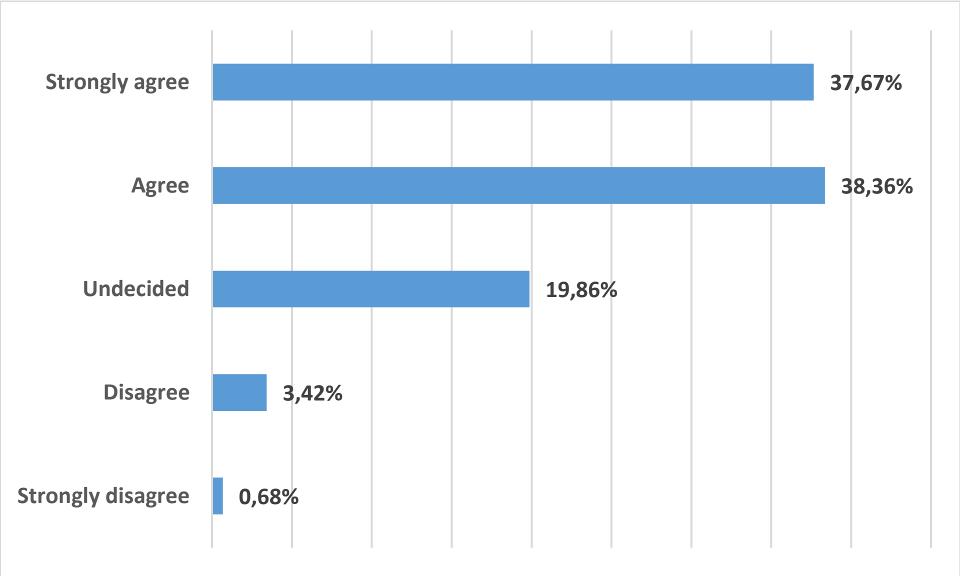

Figure 4.2.9: Perceived level of support for the training of procurement officials

Figure 4.2.10 shows a bar chart for the perception held by participants about the extent to which STLM procurement officials complied with relevant laws, regulations, and best practice codes in the course of service delivery. The bar chart shows that 73.47% of participants believed that the level of compliance was good enough.

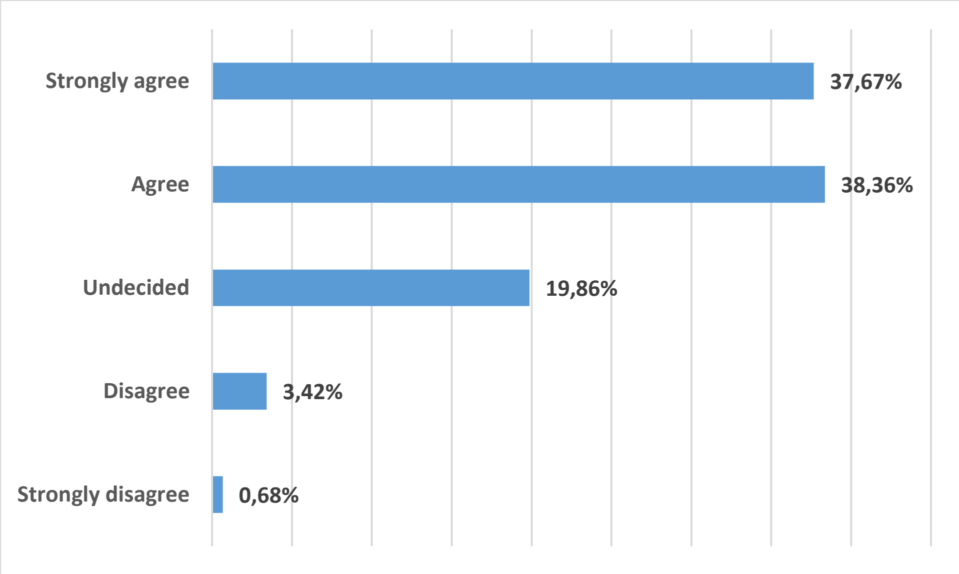

Figure 4.2.10: Perceived level of support provided to procurement employees

Figure 4.2.11 shows a bar chart for the perception held by participants about the level of support provided to procurement employees and officials by the top leadership of the local municipality. The bar chart shows that 76.87% of participants believed that enough support was provided to procurement employees and officials by the top leadership of the local municipality.

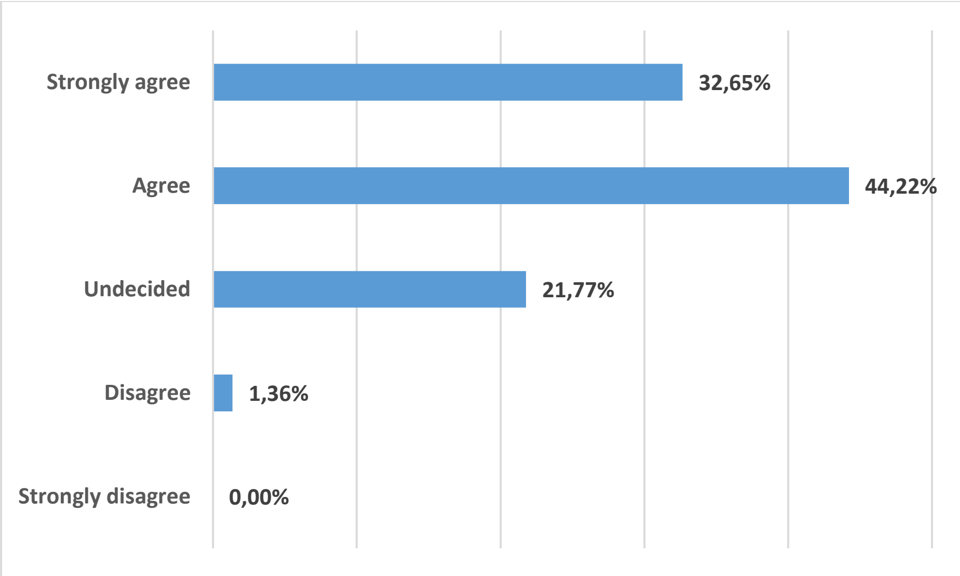

Figure 4.2.11: Perceived level of support provided to procurement employees

The frequency tables and percentages presented in this section indicate that there is a need to enhance the current level of compliance with guidelines issued to public sector entities by the South African National Treasury on how public procurement processes should be adjudicated and processed. There is a need for better performance in terms of working on remarks and comments received from the South African Auditor-General. The main challenges in this regard have been pointed out by Mojaki, Tuyikeze and Ndlovu (2024), Manyathi, Burger and Moritmer (2021), Ngcobo and Conradie (2024) and Williams (2023) in which the authors state the need for improved transparency and accountability in public sector procurement processes. Doing so enhances the ability of local municipalities and provincial Governments to minimise wasteful expenditure in public sector entities (Bolton, 2006; Eyaa, & Oluka, 2011).

4.3. RESULTS FROM BIVARIATE ANALYSIS

The strength of association of 57 factors with the ability to render quality procurement services at Steve Tshwete Local Municipality (STLM) was measured by estimating observed values of the Pearson chi-square statistic (Cohen, West & Aiken, 2013) and probability values. At the 5% level of significance, important associations have large magnitudes of the chi-square statistic and small probability values (less than 0.05). This exercise identified 9 variables that are associated with the ability of employees to render quality procurement services at the local municipality. These 9 variables are displayed below in Table 4.3.1.

Table 4.3.1: Significant bivariate associations (n=147)

Determinants of quality in public procurement services	Observed chi-square value	Probability value
Awareness of employees about changes that are made to procurement policy on a regular basis	13.6785	0.000
Alignment of procurement budget with procurement plan	9.7761	0.008
The ability of municipal employees to work with electronic procurement systems	9.5491	0.009
Position of municipal employee	10.6213	0.014
Penalising misconduct	8.5407	0.015
Adequate training of procurement employees	7.0760	0.029
The availability of enough operating cost for procurement services	6.4324	0.040
Treating all procurement officials equally	6.4191	0.041
The availability of a procurement policy that covers all aspects of procurement services	6.1895	0.043

The table shows that the ability of procurement employees to render quality services is associated with the following 9 variables:

1. Awareness of employees about changes that are made to procurement policy on a regular basis
2. Alignment of procurement budget with procurement plan
3. The ability of municipal employees to work with electronic procurement systems
4. Position of municipal employee
5. Penalising misconduct
6. Adequate training of procurement employees
7. The availability of enough operating cost for procurement services
8. Treating all procurement officials equally
9. The availability of a procurement policy that covers all aspects of procurement services

The above 9 variables are used for performing subsequent multivariate analysis by using exploratory factor analysis (EFA). Thus, the results shown above can be seen as preliminary results.

4.4. RESULTS FROM EXPLORATORY FACTOR ANALYSIS

Based on estimates obtained from bivariate analysis, exploratory factor analysis (Mertler and Reinhart, 2016) was performed on the 9 variables identified by using crosstab analyses. The main benefit of exploratory factor analysis is that the model is helpful for identifying a suitable factor structure for testing the research hypotheses of study in which it is claimed that there is a relationship between observed and underlying latent variables of study. Exploratory factor analysis is suitable for identifying influential variables of study in cases where a deductive research approach is used. This enables the researcher to test the relevance, benefit and veracity of well-known theoretical principles that are published in the literature.

Watkins (2018) posits that exploratory factor analysis (EFA) is suitable for identifying variables that are influential predictors. The dependent variable of study is the extent to which employees adhere to best practice in procurement processes. The level of performance of employees was assessed by using a composite index developed by Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029). Watkins (2018: 219-246) recommends that taking 20 or more observations per variable of study yields reliable estimates in exploratory factor analysis. In this study, exploratory factor analysis was performed by taking 5 variables of study, with a sample of size of 147. According to the author, the sample size of study (n=147) is large enough for performing exploratory factor analysis.

The Cronbach Alpha test was used for ensuring the level of reliability and internal consistency (Hair Jr, Page & Brunsveld, 2019) in the 5 variables used for performing exploratory factor analysis. The estimated Cronbach Alpha coefficients of these 5 variables had magnitudes of 0.710 or more, thereby confirming that measurement scales used in the study were reliable and internally consistent enough (Watkins, 2018). Table 4.4.1 displays values of Cronbach Alpha coefficients for the 5 variables of study used for performing exploratory factor analysis.

Table 4.4.1: Cronbach Alpha coefficients (n=147)

Variable of study	Cronbach Alpha coefficient
Awareness of employees about changes that are made to procurement policy on a regular basis (aware)	0.787
Alignment of procurement budget with procurement plan (aligned)	0.774
The ability of municipal employees to work with electronic procurement systems (electronic)	0.789
Position of municipal employee (position)	0.721
Penalising misconduct (penalize)	0.710

According to Watkins (2018), the estimated Cronbach Alpha coefficients displayed in Table 4.4.1 are large enough to perform exploratory factor analysis. Table 4.4.2 shows a correlation matrix obtained from exploratory factor analysis.

Table 4.4.2: Correlation matrix (n=147)

	aware	aligned	electronic	position	penalise
aware	1.000	0.043	0.251	-0.059	-0.167
aligned	0.043	1.000	0.026	0.548	0.043
electronic	0.251	0.026	1.000	0.213	0.251
position	-0.059	0.548	0.213	1.000	-0.059
penalise	-0.167	0.043	0.251	-0.059	1.000

Table 4.4.3 shows a component matrix obtained from exploratory factor analysis. The table shows that 3 components are extracted from exploratory factor analysis by using principal component analysis (Watkins, 2018) for each one of the 5 predictor variables of study.

Table 4.4.3: Component matrix obtained from exploratory factor analysis (n=147)

Component matrix			
	Component		
Variable of study	1	2	3
aware	0.121	0.488	-0.764
aligned	0.808	-0.305	0.000
electronic	0.435	0.779	0.000
position	0.858	-0.246	0.000
penalise	0.121	0.488	0.764

Standard goodness-of-fit tests were used for assessing the reliability of estimates obtained from exploratory factor analysis. Table 4.4.4 shows Kaiser-Meyer-Olkin Measures (KMO) of sampling adequacy (Watkins, 2018) estimated from exploratory factor analysis. Values of KMO vary from 0 to 1. KMO values of 0.75 or above indicate that the sample size of study is adequate (Watkins, 2018). The table shows that the estimated value of KMO is 0.847, a figure which is large enough. Thus, estimates obtained from exploratory factor analysis are reliable.

Table 4.4.4: Goodness-of-fit tests for exploratory factor analysis (n=147)

Goodness-of-fit test	Estimated value of statistic
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.847
Observed value of the chi-square statistic	17.246
Degree of freedom	10
Probability value for Bartlett’s test of sphericity	0.002

Principal component analysis was used for extracting factors by using principal component analysis methods. Table 4.4.5 shows a comparison between initial and extracted values of communalities corresponding to the 5 variables used for performing exploratory factor analysis. The table shows that the extracted communality values are large enough. According to Watkins (2018), the results suggest that the fitted factor model is reliable enough.

Table 4.4.5: Communalities estimated from exploratory factor analysis (n=147)

Variable of study	Initial communality value	Extracted communality value
aware	1.000	0.836
aligned	1.000	0.747
electronic	1.000	0.797
position	1.000	0.796
penalise	1.000	0.836

Table 4.4.6 displays estimates obtained from exploratory factor analysis (Mertler, & Reinhart, 2016). The results showed that 3 of the 9 variables used for performing factor analysis were influential predictors of performance. This was confirmed by examining estimated values of Eigen values, which were larger than 1. These 3 influential predictors of performance collectively accounted for 80.238% of the variability in the performance of employees. This figure is significantly above 75% and shows that the fitted factor analysis model is good enough for estimation purposes (Mertler, & Reinhart, 2016).

Table 4.4.6: Estimates obtained from exploratory factor analysis (n=147)

Factors affecting the performance of employees in procurement services	Eigen value	Percentage of explained variation	Cumulative percentage of explained variation
Awareness of employees about changes that are made to procurement policy on a regular basis	1.608	32.158	32.158
The ability of procurement employees to work with electronic procurement systems	1.237	24.747	56.904
Alignment of procurement budget with procurement plan	1.167	23.333	80.238

All 3 predictor variables displayed in the table above are useful. This is because they have Eigen values that are larger than 1. The above 3 factors jointly account for 80.238% of the total variability in the ability of employees to render quality procurement services at the local municipality. The fact that this figure exceeds the cut-off figure of 75% indicates that the fitted factor analysis model is adequate (Mertler, & Reinhart, 2016). Figure 4.4.1 shows a scree plot obtained from explortory factor analysis. The figure shows that 2 of the 3 predictor variables used for prforming exploratory factor analysis have Eigen values that are greater than 1. These factors are level of awareness of procurement employees about changes that are made to procurement policy on a regular basis, and the level of ability of procurement employees to work with electronic procurement systems.

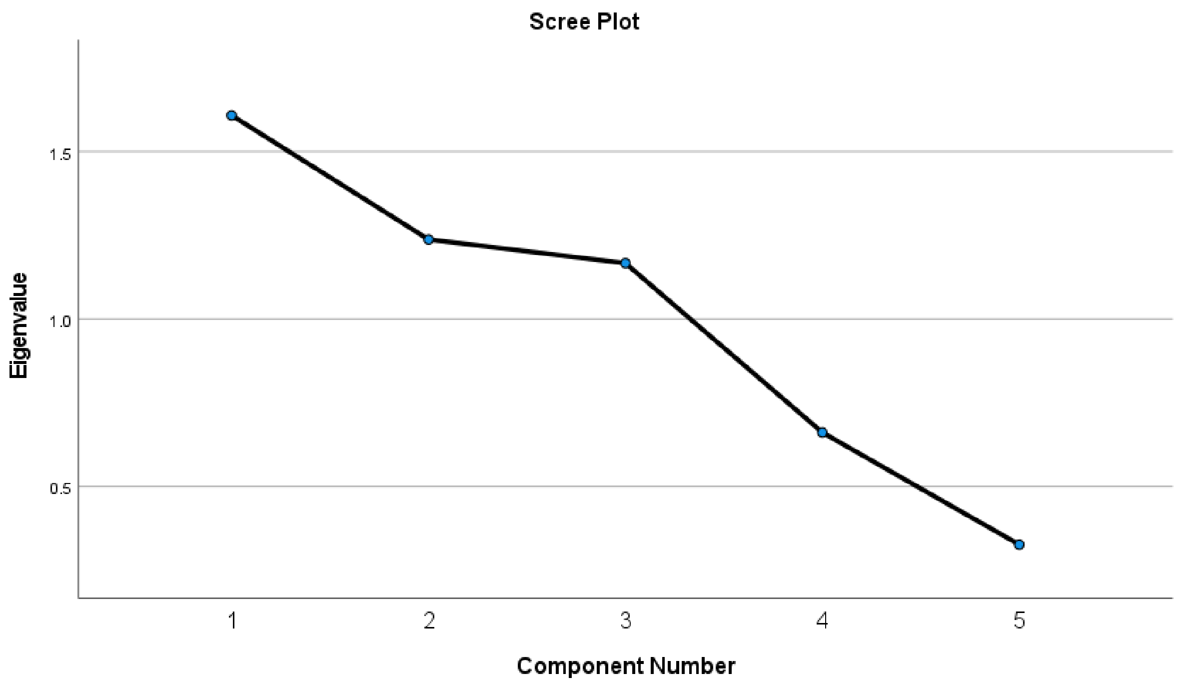

Figure 4.4.1: Scree plot obtained from exploratory factor analysis

4.5. RESULTS FROM HYPOTHESIS TESTING

The three research hypotheses in the study are tested by using the Pearson chi-square test of association (Hair Jr, Page and Brunsveld, 2019) at the 5% level of significance. At the 5% level, the null hypothesis is rejected if the probability value falls below 0.05.

Research hypothesis number 1:

The quality of procurement services performed by employees of Steve Tshwete Local Municipality is not associated with the extent to which employees were made aware about changes made to the procurement policy of the local municipality.

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|     frequency      |
| expected frequency |
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implemente |         aware
         d |        No        Yes |     Total
-----------+----------------------+----------
        No |         8          6 |        14
           |       2.8       11.2 |      14.0
           |     57.14      42.86 |    100.00
```

	27.59	5.08	9.52
	5.44	4.08	9.52
Yes	21	112	133
	26.2	106.8	133.0
	15.79	84.21	100.00
	72.41	94.92	90.48
	14.29	76.19	90.48
Total	29	118	147
	29.0	118.0	147.0
	19.73	80.27	100.00
	100.00	100.00	100.00
	19.73	80.27	100.00

Pearson chi2(1) = 13.6785 Pr = 0.000

The P-value is equal to 0.000 < 0.05 = 5%. The null hypothesis is rejected at the 5% level of significance. Thus, there is a significant association between the two variables of study at the 5% level of significance. That is, the quality of procurement services performed by employees of Steve Tshwete Local Municipality is significantly associated with the extent to which employees were made aware about changes made to the procurement policy of the local municipality.

Research hypothesis number 2:

The quality of procurement services performed by employees of Steve Tshwete Local Municipality is not associated with the extent to which the municipal budget is aligned with the procurement plan of the municipality.

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| Key                |
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|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             aligned
         d |        No        Yes        Yes |     Total
-----------+---------------------------------+----------
        No |         5          7          2 |        14 
           |       1.6        7.4        5.0 |      14.0 
           |     35.71      50.00      14.29 |    100.00 
           |     29.41       8.97       3.85 |      9.52 
           |      3.40       4.76       1.36 |      9.52 
-----------+---------------------------------+----------
       Yes |        12         71         50 |       133 
           |      15.4       70.6       47.0 |     133.0 
           |      9.02      53.38      37.59 |    100.00 
           |     70.59      91.03      96.15 |     90.48 
           |      8.16      48.30      34.01 |     90.48 
-----------+---------------------------------+----------
     Total |        17         78         52 |       147 
           |      17.0       78.0       52.0 |     147.0 
           |     11.56      53.06      35.37 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
```

```
          |     11.56      53.06      35.37 |    100.00

        Pearson chi2(2) =   9.7761   Pr = 0.008
```

The P-value is equal to 0.008 < 0.05 = 5%. The null hypothesis is rejected at the 5% level of significance. Thus, there is a significant association between the two variables at the 5% level of significance. That is, the quality of procurement services performed by employees of Steve Tshwete Local Municipality is significantly associated with the extent to which the municipal budget is aligned with the procurement plan of the municipality.

Research hypothesis number 3:

The quality of procurement services performed by employees of the Steve Tshwete Local Municipality (STLM) is not associated with the extent to which procurement employees and officials are capable of utilising electronic public procurement procedures effectively.

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|     frequency      |
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|   row percentage   |
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|  cell percentage   |
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implemente |            electronic
         d |        No        Yes        Yes  |     Total
-----------+----------------------------------+----------
        No |        11          0          3  |        14
           |       5.9        3.9        4.2  |      14.0
           |     78.57       0.00      21.43  |    100.00
           |     17.74       0.00       6.82  |      9.52
           |      7.48       0.00       2.04  |      9.52
-----------+----------------------------------+----------
       Yes |        51         41         41  |       133
           |      56.1       37.1       39.8  |     133.0
           |     38.35      30.83      30.83  |    100.00
           |     82.26     100.00      93.18  |     90.48
           |     34.69      27.89      27.89  |     90.48
-----------+----------------------------------+----------
     Total |        62         41         44  |       147
           |      62.0       41.0       44.0  |     147.0
           |     42.18      27.89      29.93  |    100.00
           |    100.00     100.00     100.00  |    100.00
           |     42.18      27.89      29.93  |    100.00

        Pearson chi2(2) =   9.5491   Pr = 0.009
```

The P-value is equal to 0.009 < 0.05 = 5%. The null hypothesis is rejected at the 5% level of significance. Thus, there is a significant association between the quality of procurement services performed by employees of Steve Tshwete Local Municipality and the extent to which procurement employees and officials are capable of utilising electronic public procurement procedures effectively.

Table 4.5.1: Summary of results from hypothesis testing (n=147)

Hypothesis tested by research at the 5% level of significance	P-value	Decision taken
The quality of procurement services performed by employees of the municipality is not associated with the extent to which employees were made aware about changes made to the procurement policy of the local municipality.	P=0.000	Rejected
The quality of procurement services performed by employees of the municipality is not associated with the extent to which the municipal budget is aligned with the procurement plan of the municipality.	P=0.008	Rejected
The quality of procurement services performed by employees of the municipality is not associated with the extent to which municipal employees are capable of utilising electronic public procurement procedures effectively.	P=0.009	Rejected

4.6: CHAPTER SUMMARY

Chapter 4 has provided results obtained from various procedures of statistical data analyses.

Chapter 5 will provide a critical discussion of the main findings of study.

CHAPTER 5: DISCUSSION OF RESULTS

5.1: MAJOR FINDINGS OF STUDY

The research was conducted to assess and evaluate obstacles that undermine the perceived quality of public procurement services that are performed in Steve Tshwete Local Municipality by employees of the municipality. Quantitative data was gathered from 147 employees of Steve Tshwete Municipality who worked on procurement services in the local municipality by using a questionnaire of study. The study was performed by using quantitative methods of data gathering and analyses including exploratory factor analysis. The results showed that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards. The study found that the quality of procurement services performed by employees of the municipality was undermined by 3 factors. These 3 factors were regular awareness of employees about changes in procurement policy, the alignment of the budget with procurement plan, and the extent to which employees were capable of working on electronic pubic procurement system.

Results obtained from bivariate analysis showed that the ability of procurement employees to render quality services is associated with the following 9 variables:

1. Awareness of employees about changes that are made to procurement policy on a regular basis
2. Alignment of procurement budget with procurement plan

3. The ability of municipal employees to work with electronic procurement systems
4. Position of municipal employee
5. Penalising misconduct
6. Adequate training of procurement employees
7. The availability of enough operating cost for procurement services
8. Treating all procurement officials equally
9. The availability of a procurement policy that covers all aspects of procurement services

Results obtained from exploratory factor analysis (EFA) showed that the ability of employees and officials to provide quality procurement services at Steve Tshwete Local Municipality (STLM) was significantly influenced by the following 3 factors:

1. Awareness of employees about changes that are made to procurement policy on a regular basis

2. The ability of municipal employees to work with electronic procurement systems

3. Alignment of procurement budget with procurement plan

5.2: A CRITICAL ANALYSIS OF KEY FINDINGS OF STUDY

The research has resulted in valuable findings. The main aim of research was to determine obstacles that undermine the perceived quality of public procurement services that are performed in Steve Tshwete Local Municipality by employees of the municipality. The study was carried out by gathering quantitative data collected from 147 employees of Steve Tshwete Local Municipality (STLM) who worked on procurement services in the local municipality by using a questionnaire of study. The main finding of research was that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards.

The other main finding of research was that the quality of procurement services performed by employees of the municipality was undermined by 3 variables of study. These variables of study were regular awareness of employees about changes in procurement policy, the alignment of the budget with procurement plan, and the extent to which employees were capable of working on electronic pubic procurement system. The survey carried out by Ye, Suleiman and Huo (2022) has led to similar findings.

Results obtained from bivariate analysis showed that the ability of procurement employees to render quality services was associated with the following 9 variables of study:

1. Awareness of employees about changes that are made to procurement policy on a regular basis
2. Alignment of procurement budget with procurement plan
3. The ability of municipal employees to work with electronic procurement systems
4. Position of municipal employee
5. Penalising misconduct
6. Adequate training of procurement employees
7. The availability of enough operating cost for procurement services
8. Treating all procurement officials equally
9. The availability of a procurement policy that covers all aspects of procurement services

Results obtained from exploratory factor analysis (EFA) showed that the ability of employees and officials to provide quality procurement services at Steve Tshwete Local Municipality (STLM) was significantly influenced by the following 3 factors:

1. Awareness of employees about changes that are made to procurement policy on a regular basis
2. The ability of municipal employees to work with electronic procurement systems
3. Alignment of procurement budget with procurement plan

All quantitative results estimated from data analyses were reliable. This was evidenced by conducting various goodness-of-fit tests that were carried out for each type of quantitative data analysis. Findings obtained from the study are similar to findings reported by Ansel and Boin (2019: 1079) in which the authors have shown the benefits of fiscal discipline and commitment to compliance with guidelines on financial expenditures and the implementation of municipal projects. The research has shown that project plans adopted by local municipalities should be adequately aligned to municipal budgets and the availability of marketing and networking skills procurement employees require to source goods and services at the most affordable cost. The set of skills that are essential for satisfactory performance are listed in a report published by APICS (2016). A few examples of essential skills are marketing, networking and business intelligence skills, project management skills, bookkeeping, auditing, accounting and presentation skills, report-writing, documentation and project management skills. Procurement management employees and officials require these set of skills to be able to source goods and services that are needed in local municipalities at an affordable cost.

Berger and Roman (2018:261-288) have provided a list of essential skills procurement and supply chain management employees and officials should possess to perform adequately. Such employees and officials need to possess robust skills in negotiation, skills in analysis, good skills in the management of relationships with people who interact with them, good skills in communication, the ability to detect and manage potential risk in the market, sourcing skills that are long-term or strategic and reliable over a lengthy period of time, auditing, accounting and bookkeeping skills, report-writing skills, and skills in management and team leadership. Brown and Gray (2016: 18) have conducted a survey in Australia and have pointed out that fiscal discipline and professional and ethical integrity are essential requirements for procurement and supply chain management employees and officials. The study carried out by the authors has shown the need for the highest standard of ethical responsibility among procurement and supply chain management employees and officials working in the public sector.

Davey and Gtaenby (2017) posit that skills in the analysis of data sets, the examination of records, bookkeeping, auditing, and financial record-keeping are essential for a successful procurement and supply chain management activity in local municipalities. Procurement employees must possess skills in comparing market prices, the comparison of qualities of products, the comparison of selling costs, the verification of product quality, data capturing and verification skills, as well as skills in tracking down goods and products, and the ability to save money by utilising good market-related opportunities.

Dzuke and Naude (2015:3) have identified procurement related difficulties faced by procurement employees and officials in the public sector of Zimbabwe. The authors have found that skills in comparing selling prices, respect for accountability, adherence to fiscal guidelines and regulations, knowledge of markets, knowledge of producers with quality and affordable costs, ethical and professional integrity, and auditing, accounting and negotiation skills are highly valuable requirements. Gavurova and Kubak (2021:2) have posited that overall efficiency in the evaluation of public procurement services depends on the availability of the right set of skills as well as professional and ethical integrity. Procurement officials and employees must possess skills in identifying the right product, at the right place, with the right quantity, at the right time, and at the right cost to the buyer. These set of skills are essential in local municipalities as well.

5.3: IMPLICATIONS OF STUDY

The research has found that spreading awareness, promoting the use of electronic and digital platforms and the alignment of municipal budgets to procurement plans are helpful for ensuring quality in procurement services at Steve Tshwete Local Municipality (STLM). The research has also confirmed that the overall quality of procurement services rendered in the local municipality is good enough. The research work has confirmed that fiscal discipline and professional and ethical integrity are essential requirements for procurement and supply chain management employees and officials. The study carried out by the authors has shown the need for the highest standard of ethical responsibility among procurement and supply chain management employees and officials working in the public sector.

The survey carried out by Ye, Suleiman and Huo (2022: 1666) shows the advantages of keeping complete, accurate and up-to-date records and data on procurement processes to local municipalities. Keeping a complete, accurate and up-to-date set of records on transactions minimises the loss and abuse of municipal resources. Such databases are valuable for performing data analysis, verification of financial records, and the publication of weekly, monthly, quarterly and annual financial reports. The assessment of financial records, bookkeeping, auditing, and financial record-keeping is essential for ensuring efficiency in procurement and supply chain management activities in all local municipalities. Procurement employees must possess skills in comparing market prices, the comparison of qualities of products, the comparison of selling costs, the verification of product quality, data capturing and verification skills, as well as skills in tracking down goods and products, and the ability to save money by utilising good market-related opportunities.

Grandinetti (2017) has explored risks that undermine efficiency in procurement activities in public and private sector companies. The author posits that relationships between procurement employees and suppliers need to be based in mutual trust and long-term or strategic relationships. The author has pointed out the benefits of long-term relationships between buyers and sellers. Five stages are involved in important long-term relationships between sellers and buyers. These are the identification of the right products, services or goods, the preparation of a purchase request, the critical assessment and evaluation of suppliers who have the ability to supply, negotiation between seller and buyer, and the successful implementation of approved purchase orders.

Kakwezi and Nyeko (2019:173) have identified obstacles that undermine efficiency in public procurement processes. Main obstacles identified by the authors include lack of knowledge of markets and products, inability to compare product quality and selling prices, lack of transparency, lack of accountability, unethical conduct and inability to allow robust competition among competitors. The five pillars of good procurement services are ensuring value for money, allowing robust competition among business rivals and competitors, adherence to ethical and professional principles and guidelines, willingness to ensure fairness, objectivity and equity in the process of procurement, and the ability to audit and keep records properly.

Hanak and Korytarova (2019: 152) have carried out a survey in various Czech municipalities and have assessed obstacles to good procurement services. The authors have highlighted the need for accountability, adequate competition among suppliers, consistency in approach, ensuring value for money, ethical and professional conduct, ability to assess markets and suppliers, ability to assess and examine the quality of products and services, professional integrity and competence, and documentation, auditing, bookkeeping, presentation, negotiation, communication, marketing and networking skills.

The 5 pillars of procurement services in the public sector are the ability to ensure value for money, open and effective communication, respect for ethical principles and commitment to fairness, accountability in reporting, and ensuring equity. These 5 pillars must be met in order for public procurement processes to be effective and successful in the long-term. Meeting the above 5 pillars means procurement processes will remain cost-effective and reliable in the long-term in local municipalities (Melese, 2021: 109).

Ensuring value for money

Successful public and private sector procurement processes are based on the ability of procurement employees and officials to ensure value for money. The survey carried out by Ketokivi and Mahoney (2020: 1011-1031) has shown the need for ensuring value for money in public and private procurement activities. The ability to ensure value for money is a critical principle in public procurement services. This requires the ability of procurement employees to know their markets and suppliers well. With no knowledge of the markets and potential suppliers, it is not possible to identify suitable suppliers for products or services. A procurement employee must be capable of assessing markets and selling prices as well as quality specifications that are essential according to the buyer. The critical requirement in procurement is to secure a deal at the lowest possible cost in the market for the best possible product quality.

Open and effective communication

Mabaso (2021: 138) posits that ethical and professional integrity are central to efficiency in successful procurement processes. The author has shown the benefits of open and transparent competitive processes for ensuring the identification of the most deserving service provider and supplier of products. Transparent processes allow all competitors to present themselves and show what they can offer, at what product quality and at what cost. This process enables local municipalities to see what is on offer in the market and choose the competitor with the best possible offer of service at an affordable cost. With no transparency and open competition in bidding processes, local municipalities can easily be blindsided.

Respect for ethical principles and commitment to fairness to all competitors

The study conducted by Markieicz (2020:18269-18286) shows that commitment to ethical principles and fairness to all competitors is quite helpful for securing the best possible deals out of competitors in public sector and private companies. Ethical principles are essential for securing the best possible deals for both local municipalities and service providers. Ensuring fairness has the benefit of enabling all competitors to display or show what they are prepared to offer, at what quality, and at what cost. When this is done, local municipalities can easily choose competitors with the most value to offer at a reasonable cost.

Accountability in reporting

Detailed accountability is essential for safeguarding resources that belong to local municipalities. Moe, Newman and Sien (2017: 143) posit that detailed accountability in reporting makes auditing and verification quite easy and reliable. Appropriate disciplinary action must be taken against people who disregard fiscal processes and guidelines that apply to procurement activities. A detailed accounting process enables verification quite easy and objective enough. The authors point out that failure to demand detailed accountability from stakeholders by municipal officials is a main cause of loss of public resources in local municipalities. The authors argue that people who abuse public resources must be held accountable and assets that are abused should be recovered by taking appropriate disciplinary and legal actions.

Ensuring equity

Ofori and Fuseini (2020: 18) conducted a survey in Ghana to assess obstacles to efficiency in public procurement processes. The authors found that the use of electronic procurement processes is highly valuable for ensuring equity. The use of electronic databases enables all competitors to be represented in central databases that are considered by local municipalities. Manual databases do not ensure completeness and accuracy in public databases. The use of equity enables local municipalities to consider historically disadvantaged competitors. This is especially helpful to emerging business enterprises that are poorly resourced or equipped. A good procurement process enables poorly resourced and historically disadvantaged businesses to be considered fairly for providing services to local municipalities. By taking part in procurement services, such businesses can grow and develop capacity.

The survey carried out in Ghana by Anane, Adoma and Amuah (2019) has highlighted the need for ensuring strict ethical guidelines and principles in public procurement service delivery. The study has shown that procurement services can easily be undermined by corruption, inability to enforce municipal and financial rules, lack of training, and inadequate performance appraisal. Procurement employees and officials must have access to training to gain confidence in their jobs. Sound financial and procurement planning is helpful for avoiding errors and the loss of municipal money and manpower. Sound planning saves money and avoids unnecessary expenditures. It is also necessary to avoid unnecessary delays in service delivery.

The main aim of research was to determine obstacles that undermine the perceived quality of public procurement services that are performed in Steve Tshwete Local Municipality (STLM) by employees and officials working in the local municipality. The study was carried out by gathering quantitative data collected from 147 employees of Steve Tshwete Local Municipality (STLM) who worked on procurement services in the local municipality by using a questionnaire of study. The main finding of research was that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards. The other main finding of research was that the quality of procurement services performed by employees of the municipality was undermined by 3 variables of study. These variables of study were regular awareness of employees about changes in procurement policy, the alignment of the budget with procurement plan, and the extent to which employees were capable of working on electronic pubic procurement system.

Bivariate analysis has led to the identification of 9 useful factors that affect the quality of procurement services rendered by municipal procurement employees and officials. These 9 variables were the level of awareness of employees about changes that are made to procurement policy on a regular basis, the alignment of procurement budget with procurement plan, the ability of municipal employees to work with electronic procurement systems, the position held by participants of the survey in the local municipality, commitment to punish employees who fail to follow guidelines, the provision of training opportunities to procurement employees, the availability of enough operating cost for procurement services, the treatment of all procurement employees and officials equally, and the availability of a procurement policy that covers all aspects of procurement services.

Multivariate results of data analysis led to the identification of 3 influential factors. These were results estimated from exploratory factor analysis (EFA). These 3 influential factors were the level of awareness of employees about changes that are made to procurement policy on a regular basis, the ability of municipal employees to work with electronic or digital procurement systems and applications, and the alignment of the procurement budget with procurement plan adopted by the local municipality. Multivariate results of data analysis are relatively more reliable than univariate and bivariate results of data analysis (Watkins, 2018). Thus, they carry relatively much more importance.

The reliability of all estimated results of data analyses was ascertained by using appropriate goodness-of-fit tests. Such tests confirmed that all estimated results obtained from quantitative data analyses were reliable. This was evidenced by conducting various goodness-of-fit tests that were carried out for each type of quantitative data analysis. Findings obtained from the study are similar to findings reported by Ansel and Boin (2019: 1079) in which the authors have shown the benefits of fiscal discipline and commitment to compliance with guidelines on financial expenditures and the implementation of municipal projects. Results obtained from this survey have confirmed that project plans adopted by the local municipality should be adequately aligned to municipal budgets and the availability of municipal resources. The results have also shown that procurement employees and officials must possess adequate marketing and networking skills so that they can find affordable goods and services in the market by conducting appropriate market research. This capacity enables the local municipality to secure quality services at an affordable cost.

Wolbers, Kuipers and Boin (2021: 375) have listed down desirable attributes of efficient procurement employees and officials working in the public sector. Such attributes are valuable for ensuring the acquisition of quality goods and services at the most affordable cost. A comprehensive list of desirable skills that are helpful for ensuring quality procurement services at municipal level is shown in a report published by APICS (2016). A few examples of essential skills are marketing, networking and business intelligence skills, project management skills, bookkeeping, auditing, accounting and presentation skills, report-writing, documentation and project management skills. Procurement management employees and officials require these set of skills to be able to source goods and services that are needed in local municipalities at an affordable cost.

Berger and Roman (2018:261-288) have provided a list of essential skills procurement and supply chain management employees and officials should possess to perform adequately. Such employees and officials need to possess robust skills in negotiation, skills in analysis, good skills in the management of relationships with people who interact with them, good skills in communication, the ability to detect and manage potential risk in the market, sourcing skills that are long-term or strategic and reliable over a lengthy period of time, auditing, accounting and bookkeeping skills, report-writing skills, and skills in management and team leadership.

Brown and Gray (2016: 18) have conducted a survey in Australia and have pointed out that fiscal discipline and professional and ethical integrity are essential requirements for procurement and supply chain management employees and officials. The study carried out by the authors has shown the need for the highest standard of ethical responsibility among procurement and supply chain management employees and officials working in the public sector.

Davey and Gtaenby (2017) posit that skills in the analysis of data sets, the examination of records, bookkeeping, auditing, and financial record-keeping are essential for a successful procurement and supply chain management activity in local municipalities. Procurement employees must possess skills in comparing market prices, the comparison of qualities of products, the comparison of selling costs, the verification of product quality, data capturing and verification skills, as well as skills in tracking down goods and products, and the ability to save money by utilising good market-related opportunities.

Dzuke and Naude (2015:3) have identified procurement related difficulties faced by procurement employees and officials in the public sector of Zimbabwe. The authors have found that skills in comparing selling prices, respect for accountability, adherence to fiscal guidelines and regulations, knowledge of markets, knowledge of producers with quality and affordable costs, ethical and professional integrity, and auditing, accounting and negotiation skills are highly valuable requirements. Gavurova and Kubak (2021:2) have posited that overall efficiency in the evaluation of public procurement services depends on the availability of the right set of skills as well as professional and ethical integrity. Procurement officials and employees must possess skills in identifying the right product, at the right place, with the right quantity, at the right time, and at the right cost to the buyer. These set of skills are essential in local municipalities as well.

5.4: RECOMMENDATIONS OF STUDY

This particular survey was carried out at Steve Tshwete Local Municipality (STLM) in the province of Mpumalanga has led to the identification of 3 influential factors that affect the quality of procurement services that are rendered by municipal procurement employees and their superiors or officials working in the local municipality. The 3 influential factors affecting the quality of procurement services were identified by performing exploratory factor analysis (EFA) and were the level of awareness of employees about changes that are made to procurement policy on a regular basis, the ability of municipal employees to work with electronic or digital procurement systems and applications, and the alignment of the procurement budget with procurement plan adopted by the local municipality. The research was carried out with a view to assess and evaluate obstacles that undermine the perceived quality of public procurement services that are performed in Steve Tshwete Local Municipality by employees of the municipality. Quantitative data was gathered from 147 employees of Steve Tshwete Municipality who worked on procurement services in the local municipality by using a questionnaire of study. The study was performed by using quantitative methods of data gathering and analyses including exploratory factor analysis. The results showed that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards.

In light of results achieved from this particular research, the following three practical recommendations are made to the top leadership of Steve Tshwete Local Municipality (STLM) so that the quality and efficiency of procurement services rendered by municipal employees and their line function managers can be enhanced:

- There is a need to promote awareness about changes that are made to procurement and supply chain management policies by the top leadership of Steve Tshwete Local Municipality (STLM) so that all relevant employees are fully aware of such changes. Knowledge of such changes and prompt awareness is highly helpful for saving scarce resources such as money, time and manpower. Prompt awareness by all relevant employees and their line function managers can save valuable resources significantly. Doing so is also essential for keeping up employee morale.

- The growing local and international trend is that digital, online and electronic methods of procurement and supply chain management services are replacing traditional modes of manual service delivery. This trend is experienced currently in all countries including South Africa. The trend is expected to affect and transform manual methods of municipal service delivery. One area that is going to be affected is municipal level procurement and supply chain management services that are rendered by municipal employees. This is an international trend that is expected to grow and expand significantly in light of developments in the fields of e-governance, e-commerce and the digital transformation of traditional services to electronic modes of municipal services. It follows that municipal employees need to be adequately equipped and trained on how to use electronic gadgets, laptops, the internet and cloud storage and data transfer systems and applications effectively.

- The study has found that it is necessary to align procurement plans with municiplal budget. This is a result achieved from multivariate data analysis along with other findings. It is, therefore, recommended that officials working on budget at Steve Tshwete Local Municipality (STLM) need to align their procurement plans with their muncipal budget. Doing so is helpful to budget adequately for all procurement activities that are planned at municipal level.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS OF STUDY

The survey was carried out by collecting quantitative data from 147 procurement employees and officials working at Steve Tshwete Local Municipality (STLM) in Mpumalanga Province. The research work has confirmed that the quality of municipal level procurement services at Steve Tshwete Local Municipality (STLM) is undermined by 3 factors. These 3 factors are lack of awareness about changes made to procurement processes and policy at municipal level by procurement employees and their line function managers, the alignment of the municipal budget with procurement plan, and the extent to which employees were capable of working on electronic public procurement systems.

The research has produced significant results. The research has shown that 90.48% of the 147 participants of research performed adequately by standards defined by Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the remaining 9.52% of the 147 participants did not perform adequately. Results achieved from bivariate analysis identified 9 useful factors that affect the quality of procurement services rendered by municipal procurement employees and officials. These 9 variables were the level of awareness of employees about changes that are made to procurement policy on a regular basis, the alignment of procurement budget with procurement plan, the ability of municipal employees to work with electronic procurement systems, the position held by participants of the survey in the local municipality, commitment to punish employees who fail to follow guidelines, the provision of training opportunities to procurement employees, the availability of enough operating cost for procurement services, the treatment of all procurement employees and officials equally, and the availability of a procurement policy that covers all aspects of procurement services.

Results achieved from exploratory factor analysis (Watkins, 2018) identified 3 predictors of performance. These predictors were the level of awareness of employees about changes that are made to procurement policy on a regular basis, the ability of municipal employees to work with electronic or digital procurement systems and applications, and the alignment of the procurement budget with procurement plan adopted by the local municipality. All estimated results were found to be reliable. This was done by using standard goodness-of-fit tests recommended in the textbooks for each test used for performing data analysis. Results achieved from this particular research were found to be quite similar to results achieved in studies carried out by Ansel and Boin (2019: 1079). These findings indicate that fiscal discipline and commitment to compliance with guidelines on financial expenditures and the implementation of municipal projects is highly valuable for ensuring the provision of quality procurement services at STLM. Results obtained from this survey have confirmed that project plans adopted by the local municipality should be adequately aligned to municipal budgets and the availability of municipal resources. The results confirm that procurement employees and officials must possess adequate marketing and networking skills so that they can find affordable goods and services in the market by conducting appropriate market research. This capacity enables the local municipality to secure quality services at an affordable cost.

Verma (2015) has posited that successful procurement employees and officials working in the public sector are characterised by a high level of ethical and professional integrity. Examples of helpful attributes are professional integrity, competence, an in-depth knowledge of markets, effective networking, accountability to stakeholders, transparency, honesty, punctuality, and willingness to conduct market related research and networking. These set of attributes are valuable for ensuring the acquisition of quality goods and services at the most affordable cost. A similar list of desirable attributes has been published by APICS (2016). The list provides examples such as competency in marketing, networking and business intelligence skills, project management skills, bookkeeping, auditing, accounting and presentation skills, report-writing, documentation and project management skills. Procurement management employees and officials require these set of skills to be able to source goods and services that are needed in local municipalities at an affordable cost.

Professional integrity and ethical conduct are highly desirable attributes in procurement employees and officials (Berger & Roman, 2018:261). Transparency, accountability and respect for due processes are shown to be highly helpful for enhancing the quality of procurement services. Procurement employees need to possess robust skills in negotiation, skills in analysis, good skills in the management of relationships with people who interact with them, good skills in communication, the ability to detect and manage potential risk in the market, sourcing skills that are long-term or strategic and reliable over a lengthy period of time, auditing, accounting and bookkeeping skills, report-writing skills, and skills in management and team leadership. According to Brown and Gray (2016: 19), procurement employees must possess commitment to fiscal discipline, ethical guidelines, personal integrity and honesty. These qualities are equally needed in all other municipal level services.

Surveys conducted by Davey and Gtaenby (2017) and Dzuke and Naude (2015) show that sound planning, accounting, auditing, and record-keeping skills are essential traits. A regular update on market conditions is essential for effective procurement services. Efficient procurement employees are capable of assessing market conditions and negotiating to achieve good value for money. Such employees possess skills in record keeping, data analysis, report-writing, oral presentation, and negotiation. They are capable of comparing market prices, and have the ability to assess product quality, selling price, and terms and conditions of sale. These skills are helpful for tracking down goods and products, and for saving money by utilising good market-related opportunities.

Gavurova and Kubak (2021) and Dzuke and Naude (2015) posit that difficulties experienced by procurement employees and officials in the public sector often arise from lack of accountability, lack of transparency and inability to adhere to the rules of fair and objective procurement activities. Such rules are clearly stipulated in guidelines provided to local municipalities by the South African National Treasury. These guidelines and rules are highly helpful for ensuring accountability and efficiency at municipal level. Good procurement employees and officials possess good skills in comparing selling prices, compliance with fiscal guidelines and regulations, knowledge of markets, and knowledge of producers with quality and affordable costs. Such procurement employees display high levels of ethical and professional integrity.

Contributions of study to knowledge

The main contribution of study to knowledge is that it has identified 3 factors that significantly affect efficiency in procurement and supply chain management services in Steve Tshwete Local Municipality. These 3 factors are lack of awareness about changes made to procurement processes and policy at municipal level by procurement employees and their line function managers, the alignment of the municipal budget with procurement plan, and the extent to which employees were capable of working on electronic public procurement systems.

Assessment of fulfilment of specific objectives of study

Table 6.1.1 shows that the 4 specific objectives of study have all been fulfilled by obtaining results of data analyses from univariate, bivariate and multivariate analyses.

Table 6.1.1: Assessment of specific objectives of study

#	Specific objective of study	Assessment of fulfilment of specific objective of study
1	To estimate the percentage of procurement employees who perform adequately at Steve Tshwete Local Municipality.	Fulfilled. The results showed that the level of performance of 133 of the 147 employees who were chosen for the study (90.48%) was adequate by the standards of Aldrighetti, Battini, Das and Simonetto (2023: 3004-3029), whereas the level of performance of 14 of the 147 employees who were chosen for the study (9.52%) was inadequate by the same standards.
2	To determine socioeconomic factors that undermine performance by procurement	Fulfilled. The study found that the quality of procurement services performed by employees of the municipality was undermined by 3 factors. These 3 factors were regular awareness of employees about changes in procurement policy, the alignment of the

	employees working at Steve Tshwete Local Municipality.	budget with procurement plan, and the extent to which employees were capable of working on electronic public procurement system.
3	To construct a practical framework that could be performed for enhancing the level of performance of procurement employees working at Steve Tshwete local municipality.	Fulfilled. Figure 6.2.1 on Page 120 shows a framework constructed based on findings of the study. The framework is valuable for ensuring efficiency in procurement services in STLM.
4	To draw up feasible recommendations that are helpful for enhancing the level of performance of procurement employees working at Steve Tshwete local municipality.	Fulfilled. Page 112 shows feasible recommendations that are made based on results estimated from data analysis.

6.2: FRAMEWORK OF STUDY

Results achieved from the research work carried out in this survey are used for constructing a framework of study for Steve Tshwete Local Municipality (STLM). The framework constructed is displayed in Figure 6.2.1 below. The framework is similar to the framework constructed by Ambe and Badenhorst-Weiss (2012: 242-261) in a similar study.

The framework consists of the critical assessment of awareness and competence, identifying gaps, filling identified gaps, and monitoring and evaluation of performance. The implementation of the framework will enable STLM to ensure the 5 pillars of procurement services in the public sector. These 5 pillars are the ability to ensure value for money, open and effective communication, respect for ethical principles and commitment to fairness, accountability in reporting, and ensuring equity. These 5 pillars must be met in order for public procurement processes to be effective and successful in the long-term.

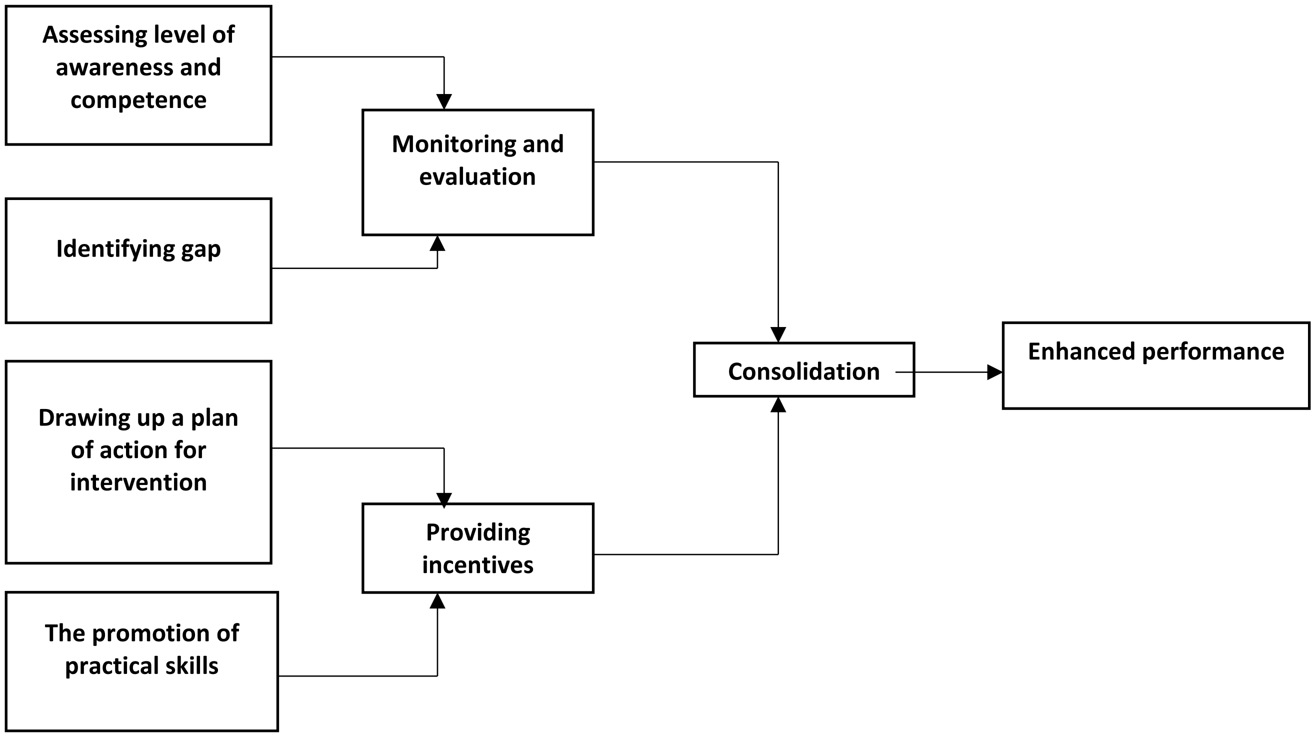

Figure 6.2.1: Framework for ensuring efficiency in procurement services in STLM

Source: Adapted from Baron (2011)

6.3: LIMITATIONS OF STUDY AND CALL FOR FUTURE RESEARCH

Limitations of study

The study has two minor limitations. Firstly, only quantitative methods of data gathering and analyses were used in the study. Secondly, the survey was carried out in Steve Tshwete Local Municipality (STLM) only due to lack of resources. The same study could be carried out in all other local municipalities in Mpumalanga Province by adequately resourced researchers in future.

Call for future research

Due to lack of resources, the survey was carried out only in Steve Tshwete Local Municipality (STLM). The same study could be carried out in all other local municipalities in Mpumalanga Province by adequately resourced researchers in future. The quality of research could be enhanced by utilising a combination of quantitative and qualitative methods of data collection and analyses.

LIST OF REFERENCES

ABABIO, E., VYAS-DOORGAPERSAD, S. & MZINI, L. 2019. *Service Delivery and Under-expenditure: Strategies Towards Effective Control of Public Funds. Journal of public administration*, 43(3): 1-14.

ABERU, A. 2019. Factors Affecting Public Procurement Performance in Ethiopia: The Case of Public Procurement and Property Disposal Services. *Journal of Transport and Supply Chain Management*, 14(4): 8-10.

ABUTABENJEH, S., 2021. Strategic management in state government two servants of the same master: Procurement and finance. *International Journal of Public Administration*, 44(7): 607-621.

ADDO, S. 2019. Challenges of E-Procurement Adoption in the Ghana Public Sector: A survey of the Ministry of Finance. *International Peer Reviewed and Refereed Journal with Indexed journal Platforms*, 1(7): 44-80.

ALDRIGHETTI, R., BATTINI, D., DAS, A. & SIMONETTO, M. 2023. The performance impact of Industry 4.0 technologies on closed-loop supply chains: insights from an Italy based survey. *International Journal of Production Research*, 61(9): 3004-3029.

ALMANASREH, E., MOLES, R. J. & CHEN, T. F. 2022. *A practical approach to the assessment and quantification of content validity*. In *Contemporary Research Methods in Pharmacy and Health Services (pp. 583-599).* New York: Academic Press.

AMAESHI, K. M., OSUJI, O. K. & NNODIM, P., 2008. Corporate social responsibility in supply chains of global brands: A boundaryless responsibility? Clarifications, exceptions and implications. *Journal of Business Ethics*, 81(1): 223-234.

AMBE, I. M., 2016. Public procurement trends and public procurement trends and developments in South Africa. *Research journal of business and management*, 3(4): 277-290.

AMBE, I. & BADENHORST-WEISS, C. 2012. Procurement challenges in the South African Public Sector. *Journal of Transport and Supply Chain Management*, 6(1): 242-261.

ANANE, A., ADOMA, V. & AWUAH, G. 2019. The effect of procurement practices on service delivery: A case study of VRA, Ghana. *Asian Journal of Economics, Business and Accounting*, 13(1): 1-23.

ANANE, A. & KWARTENG, G. 2019. Prospects and challenges of Procurement Performance Measurement in Selected Technical universities in Ghana. *Asian Journal of Economics, Business and Accounting*, 13(2): 1-18.

ANDERSON, A., BAKER, F. & ROBINSON, D. T. 2017. Precautionary savings, retirement planning and misperceptions of financial literacy. *Journal of Financial Economics*, 126(2): 383-398.

ANSELL, C. & BOIN, A., 2019. Taming deep uncertainty: The potential of pragmatist principles for understanding and improving strategic crisis management. *Administration & Society*, 51(7): 1079-1112.

APICS. 2016. *Understanding supply chain risk areas, solutions, and plans*. [Online]. Available from: http://www.apics.org/docs/ [Accessed: 17 Dec 2024].

AZANLERIGU, J. & AKAY, E. 2015. Prospects and Challenges of E-Procurement in Some Selected Public Institutions in Ghana. *European Journal of Business and Management*, 7(29), 1-13.

BABBIE, E. 2016. *The Basics of Social Research. 7th Ed*. Boston: Cengage Learning.

BADI, S. & MURTAGH, N. 2019. Green supply chain management in construction: A systematic literature review and future research agenda. *Journal of cleaner production*, 223(1): 312-322.

BAKER, P. 2006. Designing distribution centres for agile supply chains. *International Journal of Logistics*, 9(3): 207-221.

BANSAL, P. & ROTH, K. 2000. Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4): 717-736.

BARON, A. 2011. Measuring human capital. *Strategic HR Review*, 10(2): 31-34.

BERGER, A. N. & ROMAN, R. A. 2018. Finance and the real economy: Evidence from the US. *Handbook of finance and development*, 1(1): 261-288.

BERTRAM, D. 2012. *Likert Scales.* [Online]. Available from: https://scirp.org/reference/ReferencesPapers.aspx?ReferenceID=1811222 [Accessed: 17 Dec 2024].

BHANDAL, R., MERITON, R., KAVANAGH, R. E. & BROWN, A. 2022. The application of digital twin technology in operations and supply chain management: A bibliometric review. *Supply Chain Management*, 27(2): 182-206.

BHARDWAJ, A. & KETOKIVI, M. 2021. Bilateral dependency and supplier performance ambiguity in supply chain contracting: Evidence from the railroad industry. *Journal of Operations Management*, 67(1): 49-70.

BOLTON, P. 2006. Government procurement as a policy tool in South Africa. *Journal of Public Procurement*, 6(3): 193-217.

BREWER, B. & ARNETTE, A. N. 2017. Design for procurement: What procurement driven design initiatives result in environmental and economic performance improvement? *Journal of Purchasing and Supply Management*, 23(1): 28-39.

BROWN, S., FARRELL, L., HARRIS, M. N. & SESSIONS, J. G. 2006. Risk preference and employment contract type. *Journal of the Royal Statistical Society: Series A*, 169(4): 849-863.

BROWN, S. & GRAY, D. 2016. Household finances and well-being in Australia: An empirical analysis of comparison effects. *Journal of Economic Psychology*, 53(1): 17-36.

BRYMAN, A. & BELL, E. 2011. *Business Research Methods*. Oxford: Oxford University Press.

BUTNER, K. 2010. The smarter supply chain of the future. *Strategy and leadership*, 38(1): 22-31.

CRESWELL, J. W. 2021. *A concise introduction to mixed methods research*. London: SAGE Publications.

COHEN, J., COHEN, P., WEST, S. G. & AIKEN, L. S. 2013. *Applied multiple regression/correlation analysis for the behavioral sciences*. New York: Routledge.

DAVEY, J. & GTAENBY, A. 2017. *The Government Procurement Review.* London: Gideon Roberton.

DECI, E. L., OLAFSEN, A. H. & RYAN, R. M. 2017. Self-determination theory in work organizations: The state of a science. *Annual review of organizational psychology and organizational behavior*, 4(1): 19-43.

DOBRZYKOWSKI, D., DEILAMI, V. S., HONG, P. & KIM, S. C. 2014. A structured analysis of operations and supply chain management research in healthcare (1982–2011). *International Journal of Production Economics*, 147(1): 514-530.

DOWNES, J. & GOODMAN, J. 2006. *Baron's financial guide: Dictionary of finance and investment terms*. Oxford: Oxford University Press.

DUNN, R. L. 2017. Other Transactions Contracts. *National Defense*, 101(763): 15-17.

DUR, A. & DE BIEVRE, D. 2007. The question of interest group influence. *Journal of Public Policy*, 27(1): 1-12.

DZUKE, A. & NAUDE, M. 2015. Procurement Challenges in the Zimbabwe Public Sector: Preliminary Study. *Journal of Transport and Supply Chain Management*, 9(1): 1-9.

ENCA News. *ENCA news of 16 February 2022*. [Online]. Available from: https://www.enca.com/videos/market-wrap-16-february-2022 [Accessed: 17 Dec 2024].

EYAA, S. & OLUKA, P. N. 2011. Explaining non-compliance in public procurement in Uganda. *International journal of business and social science*, 2(11): 1-13.

FAHIMNIA, B., SARKIS, J. & DAVARZANI, H. 2015. Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, 162(1): 101-114.

FARELL, L., FRY, T. R. L. & RISSE, L. 2016. The significance of financial self-efficacy in explaining women's personal finance behaviour. *Journal of Economic Psychology*, 54(1): 85-99.

FARLEY, G. A. 1997. Discovering supply chain management: a roundtable discussion. *APICS-The Performance Advantage*, 7(1): 38-39.

FROHLICH, M. T. & WESTBROOK, R. 2001. Arcs of integration: an international study of supply chain strategies. *Journal of operations management*, 19(2): 185-200.

FURNEAUX, C. & BARRAKET, J. 2014. Purchasing social good(s): a definition and typology of social procurement. *Public Money & Management*, 34(4): 265-272.

FUTCHER, L., SCHRODER, C. & SOLMS, R. 2010. Information security education in South Africa. *Information Management and Computer Security,* 18(5): 366-374.

GAFFOOR, S. & CLOETE, F. 2010. Knowledge management in Local Government: The Case of Stellenbosch Municipality. *SA Journal of Information Management,* 12(1): 1-7.

GANBOLD, O., MATSUI, Y. & ROTARU, K. 2020. Effect of information technology-enabled supply chain integration on firm's operational performance. *Journal of Enterprise Information Management,* 34(3): 948-989.

GANESH KUMAR, C. & NAMBIRAJAN, T. 2014. Direct and indirect effects: SCM components. *SCMS Journal of Indian Management*, 1(1): 1-13.

GANN, D. M. 1996. Construction as a manufacturing process? Similarities and differences between industrialized housing and car production in Japan. *Construction Management & Economics*, 14(5): 437-450.

GAVUROVA, B. & KUBAK, M. 2021. *The efficiency evaluation of public procurement of medical equipment*. Brussels: European Research council.

GIANNAKIS, M. 2012. The role of procurement in the management of supplier relationships. *International Journal of Procurement Management,* 5(3): 368-408.

GOLD, S., SEURING, S. & BESKE, P. 2010. Sustainable supply chain management and inter-organizational resources: a literature review. *Corporate social responsibility and environmental management*, 17(4): 230-245.

GRANDINETTI, R. 2017. Exploring the dark side of cooperative buyer-seller relationships. *Journal of Business & Industrial Marketing,* 32(2): 326-336.

GRIPSRUD, G., JAHRE, M. & PERSSON, G. 2006. Supply chain management – back to the future? *International Journal of Physical Distribution & Logistics Management,* 36(8): 643-659.

HAIR JR, J., PAGE, M. & BRUNSVELD, N. 2019. *Essentials of business research methods*. New York: Routledge.

HALL, J. H., SARKANI, S. & MAZZUCHI, T. A. 2011. Impacts of organisational capabilities in information security. *Information Management and Computer Security*, 19(3): 155-157.

HANAK, T. & KORYTAROVA, J. 2019. Procurement management in construction: Study of Czech municipalities. *Open Engineering*, 9(1): 151-158.

HANDFIELD, R. B. & LAWSON, B. 2007. Integrating suppliers into new product development. Research-Technology Management, 50(5): 44-51.

HEISKANEN, I. 2018. *Utilization of digitalization in procurement in major Finnish municipalities*. [Online]. Available from: https://lutpub.lut.fi/bitstream/handle/10024/157058/Master%E2%80%99s%20Thesis%20Iiro%20Heiskanen.pdf?isAllowed=y&sequence=1 [Accessed: 17 Dec 2024].

HERATH, T. 2008. *Essays on information security practices in organisations*. New York, ProQuest Publications.

HEYNS, G. & LUKE, R. 2012. Skills requirements in the supply chain industry in South Africa. *Journal of Transport and Supply Chain Management*, 6(1): 107-125.

HUSTON, S. J. 2010. Measuring financial literacy. *Journal of consumer affairs*, 44(2): 296-316.

JAGDEV, H. S. & BROWNE, J. 1998. The extended enterprise-a context for manufacturing. *Production Planning & Control*, 9(3): 216-229.

JIANAKOPLOS, N. A. & BERNASEK, A. 2006. Financial risk taking by age and birth cohort. *Southern Economic Journal*, 72(4): 981-1001.

JING, S. 2021. Investigating the effect of value stream mapping on procurement effectiveness: a case study. *Journal of Intelligent Manufacturing*, 32(4): 935-946.

KAKWEZI, P. & NYEKO, S. 2019. Procurement processes and performance: Efficiency and effectiveness of the procurement function. *International Journal of Social Sciences Management and Entrepreneurship*, 3(1): 172-182.

KETCHEN JR, D. J. & GIUNIPERO, L. C. 2004. The intersection of strategic management and supply chain management. *Industrial marketing management*, 33(1): 51-56.

KETOKIVI, M. & MAHONEY, J. T. 2020. Transaction cost economics as a theory of supply chain efficiency. *Production and Operations Management*, 29(4): 1011-1031.

KHAN, N. 2018. *Public Procurement Fundamental: Lesson from and for the Field.* London: Emerald Publishing.

KIM, I. & MIN, H. 2011. Measuring supply chain efficiency from a green perspective. *Management Research Review*, 34(11): 1169-1189.
KIOKO, N. & WERE, S. 2014. Factors Affecting Efficiency of the Procurement Function at the Public Institutions in Kenya: A Case of Supplies Branch in Nairobi. *International Journal of Business & Law Research*, 2(2): 1-14.

KOKETSO, L. & BRAAM RUST, A. 2022. Perceived Challenges to Talent Management in the South African Public Service: An Exploratory Study of the City of Cape Town Municipality. *African Journal of Business Management*, 6(6): 2221-2233.

LAMBERT, D. M. & ENZ, M. G. 2017. Issues in supply chain management: Progress and potential. *Industrial Marketing Management*, 62(1): 1-16.

LAWAL, S. 2015. *Procurement Process Design: A case study of Blissful minds Nigerian Limited*. [Online]. Available from: https://www.theseus.fi/ [Accessed: 17 Dec 2024].

LEEDY, P., ORMROD, J. & JOHNSON, L. 2019. *Practical Research Planning and Design.* 12th Ed. New York: Pearson.

LEENDERS, M. R. & FEARON, H. E. 2008. Developing purchasing's foundation. *Journal of Supply Chain Management*, 44(2): 17-27.

LEVY, P. S. & LEMESHOW, S. 2013. *Sampling of populations: Methods and applications*. New York: John Wiley & Sons.

LI, G., YANG, H., SUN, L. & SOHAL, A. S., 2009. The impact of IT implementation on supply chain integration and performance. *International journal of production economics*, 120(1): 125-138.

LI, S., NGNIATEDEMA, T. & CHEN, F. 2017. Understanding the impact of green initiatives and green performance on financial performance in the US. *Business Strategy and the Environment*, 26(6): 776-790.

LUSARDI, A. & MITCHELL, O. S. 2011. Financial literacy around the world: an overview. *Journal of Pension Economics and Finance*, 10(4): 497-508.

LUSARDI, A. & MITCHELL, O. S. 2014. The economic importance of financial literacy: theory and evidence. *Journal of Economic Literature*, 52(1): 5-44.

LUSARDI, A., MITCHELL, O. S. & CURTO, V. 2010. Financial literacy among the young. *Journal of Consumer Affairs*, 44(2): 358-380.

LUSS, H. 1982. Operations research and capacity expansion problems: A survey. *Operations Research*, 30(5): 907-947.

LUTHULI, S., NYWAO, J. & MASHAU, P. 2019. Effectiveness of training and development on employees' performance in South African Municipalities with special reference to Umzumbe Local Municipality. *Journal of politics, Economics and Society*, 9(1): 1-40.

MABASO, B. A. 2021. Computationally rational agents can be moral agents. *Ethics and Information Technology*, 23(2): 137-145.

MANU, P., MAHAMADU, A., BOOTH, C., OLOMOLAIYE, P., IBRAHIM, A. & COKER, A. 2018. Assessment of procurement capacity challenges inhibiting public infrastructure procurement: A Nigerian inquiry. *Built Environment Project and Asset Management*, 8(4): 386-402.

MANUJ, I. & MENTZER, J.T. 2008. Global supply chain risk management strategies. *International Journal Physical Distribution and Logistics Management*, 41(5): 511-514.

MANUJ, I & SAHIN, F. 2011. A model of supply chain and supply chain decision-making complexity. *International Journal of Physical Distribution and Logistics Management*, 41(5): 515-521.

MARKIEWICZ, M. T. 2020. Analysis of spatial planning documents and strategic environmental assessment reports with regard to hazards of major industrial accidents: a case study involving six Polish cities. *Environmental Science and Pollution Research*, 2(15): 18269-18286.

MARTINAITIS, Z. 2014. Measuring skills in Europe. *European Journal of Training and Development*, 38(3): 198-210.

MATINHEIKKI, J., PESONEN, T., ARTTO, K. & PELTOKORPI, A. 2017. New value creation in business networks: The role of collective action in constructing system-level goals. *Industrial Marketing Management*, 67(1): 122-133.

MELESE, F. 2021. Insights from Transaction Cost Economics for Government Organizations: An Application to the US Department of Defense (DoD). *Atlantic Economic Journal*, 49(1): 109-111.

MELLAT-PARAST, M. & SPILLAN, J. E. 2014. Logistics and supply chain process integration as a source of competitive advantage: An empirical analysis. *The international journal of logistics management*, 25(2): 289-314.

MERTLER, C. A. & REINHART, R. V. 2016. *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation*. New York: Routledge.
MHELEMBE, K. 2018. Modelling the link between supply chain risk, flexibility and performance in the public sector. *Journal of economic and management sciences,* 22(1): 13-40.

MOE, C., NEWMAN, M. & SIEN, M. 2017. The Public Procurement of information System Dialects in Requirements Specification. European Journal of Information, 26(2): 142-163.

MOHAJAN, H. K. 2018. Qualitative research methodology in social sciences and related subjects. *Journal of economic development, environment and people*, 7(1): 23-48.

MONGALE, C. O. 2022. Social discontent or criminality? Navigating the nexus between urban riots and criminal activities in Gauteng and KwaZulu-Natal Provinces, South Africa (2021). *Frontiers in Sustainable Cities*, 4(1): 1-13.

MOON, S., YI, C.Y. & NGAI E.W.T. 2012. An instrument for measuring supply chain flexibility for the textile and clothing companies. *European Journal of Operational Research*, 222(2): 191-203.

MOSHTARI, M., ALTAY, N., HEIKKILA, J. & GONCALVES, P. 2021. Procurement in humanitarian organizations: Body of knowledge and practitioner's challenges. *International Journal of Production Economics*, 233(1): 1-13.

MURALIDHAR, S. & BERLIK, E. 2017. What's your risk appetite? Helping financial advisors better serve clients (by quantifying Kahneman-Tversky's value function*). Journal of Person Finance*, 16(2): 20-36.

NIKFARJAM, H., ROSTAMY-MALKHALIFEH, M. & MAMIZADEH-CHATGHAYEH, S., 2015. Measuring supply chain efficiency based on a hybrid approach. *Transportation Research Part D: Transport and Environment*, 39(1): 141-150.

NISSEN, M. E. & SENGUPTA, K. 2006. Incorporating software agents into supply chains: Experimental investigation with a procurement task. *MIS Quarterly*, 30(1): 145-166.

NUGROHO, A., CHRISTIANANTA, B., WULANI, F. & PRATAMA, I. 2020. Exploring the Association Among Just in Time, Total Quality and Supply Chain Management Influence on Firm Performance: Evidence from Indonesia. *International Journal of Supply Chain Management*, 9(2): 920-928.

NZONZO, J. C. 2017. A discourse analysis of the exogenous and endogenous drivers of employee well-being in South Africa. *Australian Academy of Accounting and Finance Review*, 3(1): 37-49.

OFORI, D. & FUSEINI, O. 2020. Electronic Governmen Procurement Adoption in Ghana: Critical Success Factors. *Advances in Research*, 21(3): 18-34.

OETTMEIER, K. & HOFMANN, E. 2016. Impact of additive manufacturing technology adoption on supply chain management processes and components. *Journal of Manufacturing Technology Management*, 27(7): 944-968.

OFORI, D. & FUSEINI, O. 2020. Electronic Government Procurement Adoption in Ghana: Critical Success Factors. *Advances in Research*, 21(3): 18-34.

OHMAN, S. 2017. Previous experiences and risk perception: The role of transference. *Journal of Education, Society and Behavioural Science*, 23(1): 1-10.

OLHAGER, J. 2013. Evolution of operations planning and control: from production to supply chains. *International journal of production research*, 51(23-24): 6836-6843.

OTHMAN, A. A., SUNDRAM, V. K., SAYUTI, N. M. & BAHRIN, A. S. 2016. The relationship between supply chain integration, just-in-time and logistics performance: A supplier's perspective on the automotive industry in Malaysia. *International journal of supply chain management*, 5(1): 44-51.

PAMUCAR, D., CHATTERJEE, K. & ZAVADSKAS, E. K. 2019. Assessment of third-party logistics provider using multi-criteria decision-making approach based on interval rough numbers. *Computers & Industrial Engineering*, 127(1): 383-407.

PATRUCCO, A. S., LUZZINI, D. & RONCHI, S. 2017. Research perspectives on public procurement: Content analysis of 14 years of publications in the journal of public procurement. *Journal of Public Procurement*, 17(2): 229-269.

PELAELO, C. & SWAMI, B. N. 2014. Personal finance management practices and the financial stability of tertiary level student community. *An International Journal of Management Studies*, 4(1): 14-21.

POOE, D., MAFINI, C. & MAKHUBELE, D. 2015. Investigating Municipal Procurement Challenges in South Africa: A Qualitative Study. *International Business & Economics Research Journal*, 14(1): 67-78.

PRAJOGO, D. & SOHAL, A. 2013. Supply chain professionals: A study of competencies, use of technologies, and future challenges. *International journal of operations and production management*, 33(110): 1532-1554.

PRIER, E. & MCCUE, C. P. 2009. The implications of a muddled definition of public procurement. *Journal of Public Procurement*, 9(3/4): 326-370.

POOE, D. MAFINI, C. & MAKHUBELE, D. 2015. Investigating Municipal Procurement Challenges in South Africa: A Qualitative Study. *International Business & Economics Research Journal*, 14(1): 67-78.

RAHMAN, M. 2016. *The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language "Testing and Assessment" Research: A Literature Review*. [Online]. Available from: https://pearl.plymouth.ac.uk/ [Accessed: 17 Dec 2024].

RAMLI, R.K., ABDULLAH. H.S. & HASHIM. R. 2018. *Suppliers' Perception of Government Procurement and e-Procurement.* Kuala Lumpur: Malaysian Ministry of Education.

RAN, B. & QI, H. 2016. Issues and Challenges of Public Service Procurement in China: a Collaborative Governance Perspective. *International Journal of Public Policy*, 12(6): 339-358.

RAVITCH, S. & CARL, N. 2017. *Qualitative Research Bridging the Conceptual: Theoretical and Method.* Los Angeles: SAGE Publications.

REIS, P. & CABNAL, S. 2015. Public Procurement Strategy. *Safety, Public Money and Management*, 32(2): 103-110.

SAYED, M., HENDRY, L. C. & ZORZINI BELL, M. 2021. Sustainable procurement: Comparing in-house and outsourcing implementation modes. *Production Planning & Control*, 32(2): 145-168.

SCHAPPER, P. R., VEIGA MALTA, J. N. & GILBERT, D. L. 2006. An analytical framework for the management and reform of public procurement. *Journal of public procurement*, 6(1&3): 1-26.

SEURING, S. & MULLER, M. 2008. Core issues in sustainable supply chain management–a Delphi study. *Business strategy and the environment*, 17(8): 455-466.

SHAI, L., MOLEFINYANA, C. & QUINOT, G. 2019. Public procurement in the context of Broad-Based Black Economic Empowerment (BBBEE) in South Africa—Lessons learned for sustainable public procurement. *Sustainability*, 11(24): 1-13.

SHEINGATE, A. 2024. Bending the "Iron Triangle" Power, Politics, and Policy. *Agricultural History*, 98(3): 436-443.

SILVERMAN, D. 2013. *Doing Qualitative Research.* Los Angeles: SAGE Publications.

SILVIA, P. 2020. *Select a Sample: Little Quick FIX.* Los Angeles: SAGE Publications.

SINDHUJA, P.N. & KUNNATHUR, A.S. 2015. Information security in supply chains: a management control perspective. *Information & Computer Security*, 23(5): 476-496.

SINGHAL, K. & SINGHAL, J. 2012. Opportunities for developing the science of operations and supply-chain management. *Journal of Operations Management*, 30(3): 245-252.

SJOBERG, L. 2000. Factors in risk perception. *Risk Analysis*, 20(1): 1-12.

SLOVIC, P. & PETERS, E. 2006. Risk perception and affect. *Current Directions in Psychological Science*, 15(6): 322-325.

SONNICHSEN, S. D. & CLEMENT, J. 2020. Review of green and sustainable public procurement: Towards circular public procurement. *Journal of cleaner production*, 245(4): 1-13.

SOUTH AFRICAN AUDITOR-GENERAL. 2019. *Auditor-General Flags Lack of Accountability as the Major Cause of Poor Local Government Audit. Media Release, 26 June: 1-26*. [Online]. Available from: https://www.agsa.co.za/ [Accessed: 17 Dec 2024].

SOUTH AFRICAN AUDITOR-GENERAL. 2020. *Auditor-General Releases Municipal audits under the theme " not much to go around, yet not the right hands at the till. Media Release, 1 July: 1-26.* [Online]. Available from: https://www.agsa.co.za/ [Accessed: 17 Dec 2024].

SOUTH AFRICAN LOCAL GOVERNMENT ASSOCIATION. 2022. *Annual report for 2020/2021*. [Online]. Available from: http://www.salga.org.za [Accessed: 17 Dec 2024].

SOUTH AFRICAN NATIONAL TREASURY. 2008. *Local Government Capital Assets Management Guideline*. [Online]. Available from: http://www.treasury.gov.za [Accessed 14 August 2022].

SOUTH AFRICAN NATIONAL TREASURY. 2013. *Supply chain Management: Enhancing Compliance and Accountability.* [Online]. Available from: http://mfma.treasury.gov.za [Accessed: 17 Dec 2024].

SOUTH AFRICAN NATIONAL TREASURY. 2016. *SCM Review update*. [Online]. Available from: http://www.treasury.gov.za [Accessed: 17 Dec 2024].

SOUTH AFRICAN NATIONAL TREASURY. 2021. *Preferential Procurement Regulations 2017: Minister of Finane versus Afribusiness NPC ZACC 4*. [Online]. Available from: https://www.treasury.gov.za/ [Accessed: 17 Dec 2024].

SOUTH AFRICAN NATIONAL TREASURY. 2022. *Media Statement: Preferential procurement regulations.* [Online]. Available from: https://www.treasury.gov.za/ [Accessed: 17 Dec 2024].

SPECTOR, P. 2019. Do not Cross me: Optimizing the use of Cross-sectional Designs. *Journal of Business and Psychology*, 34(2): 125-137.

SPERANZA, M. G. 2018. Trends in transportation and logistics. *European Journal of Operational Research*, 264(3): 830-836.

SRAI, J. S. & LORENTZ, H. 2019. Developing design principles for the digitalisation of purchasing and supply management. *Journal of Purchasing and Supply Management*, 25(1): 78-98.

STANK, T. P. & GOLDSBY, T. J. 2000. A framework for transportation decision making in an integrated supply chain. *Supply Chain Management*, 5(2): 71-78.

STEINFELD, J. M., PRIER, E. & MCCUE, C. 2015. Public procurement and the BLS: operationalizing occupational duties. *International Journal of Public Sector Management*, 28(7): 510-527.

STEVENS, G. C. & JOHNSON, M. 2016. Integrating the Supply Chain … 25 years on. *International Journal of Physical Distribution & Logistics Management*, 46(1): 19-42.

STEVE TSHWETE LOCAL MUNICIPALITY. 2022. *Annual report for 2020/2021*. [Online]. Available from: http://www.stlm.gov.za [Accessed: 17 Dec 2024].

STOCK, J. R. & BOYER, S. L. 2009. Developing a consensus definition of supply chain management: A qualitative study. *International Journal of Physical Distribution & Logistics Management*, 39(8): 690-711.

STOCK, J. R., BOYER, S. L. & HARMON, T. 2010. Research opportunities in supply chain management. *Journal of the Academy of Marketing Science*, 38(1): 32-41.

STOFFEL, T., CRAVERO, C., LA CHIMIA, A. & QUINOT, G. 2019. Multidimensionality of sustainable public procurement (SPP)—Exploring Concepts and effects in Sub-Saharan Africa and Europe. *Sustainability*, 11(22): 1-13.

STUMBERG, R. & MEULEN, N. 2019. Supply Chain Transparency in Public Procurement-Lessons from the Apparel Sector. *Public Procurement and Human Rights*, 1(1): 1-13.

SUTHERLAND, J. 2012. Qualification mismatch and skills mismatch. *Education and Training*, 54(7): 619-632.

THAI VOLLPRECHT, J. TROMMSDORIFF, M. & HERMANN, C. 2020. *Legal Framework of Agrivoltaics in Germany.* Berlin: AIP Publishing.

TALLON, P. P. & PINSONNEAULT, A. 2011. Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model. *MIS Quarterly,* 35(2): 463-486.

TALWAR, S., KAUR, P., FOSSO WAMBA, S. & DHIR, A. 2021. Big Data in operations and supply chain management: A systematic literature review and future research agenda. *International Journal of Production Research*, 59(11): 3509-3534.

TAN, K. C. 2001. A framework of supply chain management literature. *European Journal of Purchasing & Supply Management*, 7(1): 39-48.

TARIFA-FERNANDEZ, J. & DE BURGOS-JIMENEZ, J. 2017. Supply chain integration and performance relationship: a moderating effects review. *The International Journal of Logistics Management*, 28(4): 1243-1271.

TASSABEHJI, R. & MOORHOUSE, A. 2008. The changing role of procurement: developing professional effectiveness. *Journal of purchasing and supply chain management*, 14(1): 55-68.

TEWS, K. 2005. The diffusion of environmental policy innovations: cornerstones of an analytical framework. *European Environment*, 15(2): 63-79.

THAI, K. V. 2001. Public procurement re-examined. *Journal of Public Procurement*, 1(1): 9-50.
THAKKAR, J. J. 2012. SCM based performance measurement system: a preliminary conceptualization. *Decision*, 39(3): 5-43.

TRENT, R. J. & MONCZKA, R. M. 1998. Purchasing and supply management: trends and changes throughout the 1990s. *International Journal of Purchasing and Materials Management*, 34(3): 2-11.

TRITES, G. 2013. *Information Integrity. American Institute of CPAs and Canadian Institute of Chartered Accountants*. [Online]. Available from: http//www.aicpa.org/ [Accessed: 17 Dec 2024].

TULI, K. R., KOHLI, A. K. & BHARADWAJ, S. G. 2007. Rethinking customer solutions: From product bundles to relational processes. *Journal of marketing*, 71(3): 1-17.

WATERS, D. & RINSLER, S. 2020. *New Directions in Supply Chain Management*. 7th ed. London: The Chartered Institute of Logistics and Transport.

WATKINS, M. W. 2018. Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology*, 44(3): 219-246.

WEBER, E. U. & MILLIMAN, R. A. 1997. Perceived risk attitudes: relating risk perception to risky choice. *Management Science*, 43(2): 123-144.

WEYMARK, J. A. 2005. Measurement theory and the foundations of utilitarianism. *Social Choice and Welfare*, 25(2): 527-555.

WOLBERS, J., KUIPERS, S. & BOIN, A. 2021. A systematic review of 20 years of crisis and disaster research: Trends and progress. *Risk, Hazards & Crisis in Public Policy*, 12(4): 374-392.

WU, Z., STEWARD, M.D. & HARTLEY, J.L. 2010. Wearing many hats: Supply managers' behavioural complexity and its impact on supplier relationships. *Journal of Business Research*, 63(1): 817-823.

WULANSARI, P. & RAHMI, A. 2018. *The Effect of Employee Competence and Motivation on Employee Performance.* Indonesia: Atlantis Press.

VAN DEVENTER, M. & DE KLERK, N. 2016. African generation y students' perceived personal financial management skills. *International Journal of Business and Management Studies*, 8(2): 1-14.

VERMA, S. 2015. Collaborative Public Procurement: A Comparative Review of the Indian Position with International Practices on Pooled Procurement from Competition Law Perspectives. *International Public Procurement*, 1(1): 203-219.

VOLLPRECHT, J., TROMMSDORIFF, M. & HERMANN, C. 2020. *Legal Framework of Agrivoltaics in Germany*. Berlin, Germany: AIP Publishing.

VOLPE, R. P., CHEN, H. & LIU, S. 2006. An analysis of the importance of personal finance topics and the level of knowledge possessed by working adults. *Financial Services Review*, 15(1): 81-98.

YE, Y., SULEIMAN, M. A. & HUO, B. 2022. Impact of just-in-time (JIT) on supply chain disruption risk: the moderating role of supply chain centralization. *Industrial Management & Data Systems*, 122(7): 1665-1685.

YU, W., JACOBS, M. A., SALISBURY, W. D. & ENNS, H. 2013. The effects of supply chain integration on customer satisfaction and financial performance: An organizational learning perspective. *International Journal of Production Economics*, 146(1): 346-358.

ZHENG, S., YEN, D. C. & TARN, J. M. 2000. The new spectrum of the cross-enterprise solution: the integration of supply chain management and enterprise resources planning systems. *Journal of Computer Information Systems*, 41(1): 84-93.

ZIMMERMANN, F. & FOERSTL, K. 2014. A Meta-analysis of the Purchasing and Supply Management Practice-Performance Link. *Journal of Supply Chain Management*, 50(3): 37-54.

ZURECK, A., REITER, J. & SVOBODA, M. 2018. Cross-generational investment behaviour and the impact on personal finance. *Journal of International Business Research and Marketing*, 3(2): 16-18.

APPENDIX A: QUESTIONNAIRE OF STUDY

DEPARTMENT OF MARKETING, SUPPLY CHAIN AND SPORT MANAGEMENT

Cell : 065 927 1439
Date : 12 June 2023

Dear Research Participant

I am doing research for my Master's degree studies on procurement challenges at the Steve Tshwete Local Municipality. The title of the thesis is: "**PERCEIVED PROCUREMENT CHALLENGES AFFECTING STEVE TSHWETE LOCAL MUNICIPALITY.**"

- It would have a better understanding of the perceived procurement challenges affecting Steve Tshwete Local Municipality.
- The success of the project will be determined by your cooperation. It is important that you respond frankly and honestly to each statement or question.
- This research will attempt to assist you as an administrator personnel as well as Steve Tshwete Local Municipality.
- All information will be treated as confidential, and respondents will not be discriminated in any way. We undertake to ensure your anonymity by omitting the use of names and we will erase the data as soon as data have been extracted.
- Completing the questionnaire should take approximately 15-20 minutes.
- Please complete the questionnaire and submit your answers accordingly.

Should you have any questions, or need additional information regarding this research, please do not hesitate to contact any of the following members of the research project:

Mr KA Hlongwa	**Dr TB Phume**	**Dr L Naidoo**
Student	Supervisor	Co-Supervisor
065 927 1439	**082 079 1866**	**082 498 4003**

Your co-operation in this important research project is highly appreciated.

GENERAL INSTRUCTIONS

<u>Please note the following:</u>

1. You are kindly requested to answer **all** questions. It should take about 15-20 minutes of your time.
2. Please use an (**X**) to select the number that represents your answer(s). In a few instances you will be required to write a few words.
3. Please note **Steve Tshwete Local Municipality** (**STLM)**.

SECTION A: DEMOGRAPHIC INFORMATION

1. Indicate your gender

1	Male	
2	Female	
3	Other	
4	Do not want to indicate	

2. Indicate your age?

1	21 - 30	
2	31 - 40	
3	41 - 50	
4	51 - 60	
5	61 +	

3. Please indicate your primary position that you are involved in at STLM

1	Executive Director	
2	Director	
3	Deputy Director	
4	Assistant Director	
5	Administrator	
6	Clerk	
7	Other Please specify:	

4. Please indicate the highest education qualification you have obtained:

1	No formal education	
2	Grade 12	
3	Higher Certificate	
4	Diploma	
5	Advanced Diploma	
6	Postgraduate Diploma	
7	Degree	
8	Honours degree	
9	Master's degree	
10	Doctoral degree	

5. Please indicate your term of employment experience at STLM

1	Less than 1 year	
2	1- 5 years	
3	6 - 10 years	
4	11 - 15 years	
5	16 - 20 years	
6	21+ years	

SECTION B: PROCUREMENT POLICY CHALLENGES

This section of the survey measures the implementation procurement legislation within STLM. Each question has 3 possible answers (Yes, No, or Do not know).

Please indicate **YES or NO or DON'T KNOW** to each statement below:

Question	**Yes**	**No**	**Don't know**
Is the procurement policy of the STLM fully implemented?			
The procurement policy of STLM is in line with the National Treasury regulations and the Constitution of South Africa.			
Is the procurement policy of the STLM frequently reviewed?			
Does the STLM's procurement policy cover all the aspects of procurement?			

Are employees regularly made aware of changes in procurement policy?			

SECTION C: PROCUREMENT ADMINISTRATIVE CHALLENGES

This section of the survey measures how procurement officials and end-users think and feel about the procurement administrative challenges at the **STLM**. A 5-point ordinal or Likert scale is used to measure the level of agreement of participants with statements where 1 represents (strongly disagree) and 5 represents (strongly agree).

Please indicate to what degree you agree or disagree to each statement below which best describes or is closest to your feelings.

Example of the scale

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

The procurement of goods and services at the STLM is adequately budgeted for in advance.	1	2	3	4	5
The STLM budget is aligned with its procurement plan.	1	2	3	4	5
End users' requisitions are planned by the STLM's procurement unit.	1	2	3	4	5
Each end user of the STLM prepares a multi annual work plan based on the approved budget.	1	2	3	4	5
Procurement officials of STLM are adequately trained to prepare specification as per requisitions.	1	2	3	4	5
Procurement personnel are privy to the budget as per procurement procedure	1	2	3	4	5
Lack of official procurement training lead to poor procurement performance of STLM.	1	2	3	4	5
Uncoordinated procurement processes lead to poor procurement performance of STLM	1	2	3	4	5
Lack of adequate training of STLM procurement officials on public sector procurement legislation lead to unqualified audits.	1	2	3	4	5
Adequate training of STLM procurement officials on public sector procurement legislation can improve service delivery	1	2	3	4	5

SECTION D: PROCUREMENT TECHNOLOGICAL CHALLENGES

The technology challenges are concerned with the STLM setting up of the required infrastructure to disseminate the electronic public procurement (e-PP) service effectively and efficiently. With a five-point Likert scale where 1 represents "strongly disagree", and 5 represents "strongly agree", indicate the extent to which you agree or disagree with the following statements:

STLM is not well equipped in terms of systems software infrastructure.	1	2	3	4	5
The STLM staff is inadequately prepared to work with the electronic public procurement system.	1	2	3	4	5
The STLM staff is inadequately prepared to work with the IT systems that can be used to enhance procurement.					
The STLM staff is inadequately skilled in using the Information and Communication Technology (ICT) system.	1	2	3	4	5
There are technical challenges in ICT hardware of STLM that hinder the procurement processes.	1	2	3	4	5
Procurement IT system of STLM is integrated with other units within the municipality.	1	2	3	4	5

SECTION E: LEADERSHIP CHALLENGES

The perceived procurement leadership challenges affecting Steve Tshwete Local Municipality will shed light on the critics that need to be looked into to ensure successful implementation of supply chain policy and procedures. With a five-point Likert scale where 1 represents "strongly disagree", and 5 represents "strongly agree", indicate the extent to which you agree or disagree with the following statements.

Poor procurement leadership in the STLM contributes to poor performance.	1	2	3	4	5
Transparency of procurement leaders in conducting STLM activities contribute to poor performance	1	2	3	4	5
Poor procurement leadership contribute to staff enthusiasm	1	2	3	4	5
Competition from other departments	1	2	3	4	5
Lack of leadership to deal with corruption in the procurement process demoralise the procurement staff	1	2	3	4	5
Lack of proper articulation of procurement legislation by procurement leaders confuses the staff	1	2	3	4	5
Conflict of interest contributes to corruption	1	2	3	4	5
Lack of formal procurement reporting structure leads to confusion among the staff	1	2	3	4	5

SECTION F: ECONOMIC CHALLENGES

The economic challenges concerns both the buyer and the supplier, who should be able to meet their organisational objectives. With a five-point Likert scale where 1 represents "strongly disagree", and 5 represents "strongly agree", indicate the extent to which you agree or disagree with the following statements.

The operating costs of STLM have decreased since the inception of electronic features (i.e., Central Supplier Database and e-Tender publishing portal).	1	2	3	4	5
There are economic challenges related to sourcing for clients using the Central Supplier Database at the STLM.	1	2	3	4	5
There are financial challenges that hinder procurement service at STLM.	1	2	3	4	5

SECTION G: GOOD GOVERNANCE

Steve Tshwane Local Municipality focuses on good governance and its impact on organisational performance from the employees' perceptive. With a five-point Likert scale where 1 represents "strongly disagree", and 5 represents "strongly agree", indicate the extent to which you agree or disagree with the following statements.

The STLM's approach to governance is communicated to all employees.	1	2	3	4	5
The STLM's approach to governance is communicated to all stakeholders.					
The value of good governance is understood by all the procurement officials of the STLM.	1	2	3	4	5
There is a general high level of adherence to general ethical standards within the STLM.	1	2	3	4	5

I believe a good governance system will enhance the ethical leadership implemented by the STLM council through providing strategic direction.	1	2	3	4	5
The procurement staff members are fully consulted when decision are taken.	1	2	3	4	5
Roles of procurement officials have been thoroughly explained and stated in a written document.	1	2	3	4	5
STLM encourages procurement officials to attend professional procurement training programs relevant to their position.	1	2	3	4	5
The performance evaluation is sufficient to show whether each procurement officials associated with the municipality continues to demonstrate commitment to their respective role.	1	2	3	4	5
The evaluation of the employees is performed on a regular basis.	1	2	3	4	5
The municipality management ensures that a sound system of internal control to safeguard members' interests.	1	2	3	4	5
STLM procurement officials comply with all the relevant laws, regulations, and best practice codes.	1	2	3	4	5
STLM procurement management ensures that relevant procurement procedures are in place to penalise misconduct by procurement officials.	1	2	3	4	5
A direct communication channel exists between the procurement management and subordinates at STLM.	1	2	3	4	5
STLM procurement manager ensures that procurement policies and decisions, are regularly communicated to procurement officials.	1	2	3	4	5
The municipality management shares relevant information regarding procurement performance with other stakeholders on a regular basis.	1	2	3	4	5
STLM has existing procurement mechanisms to deal with perceived conflicts of interest.	1	2	3	4	5

All procurement officials are involved when decisions are made.	1	2	3	4	5
All procurement officials are treated equally.	1	2	3	4	5
The procurement management support its procurement officials in the execution of their duties.	1	2	3	4	5
The STLM's approach to governance is communicated to all employees.	1	2	3	4	5
The STLM's approach to governance is communicated to all stakeholders.					
The value of good governance is understood by all the procurement officials of the STLM.	1	2	3	4	5

End of questionnaire

Thank you for participating in my study

APPENDIX B: RESULTS FROM CROSSTAB ANALYSES

```
. use c:\students\Hlongwa 2.dta, clear

. for var gender agecat position educ durempt policy treasury
reviewed cover aware budgeted aligned planned approved trained
privy lacktrain uncoordinated legislation1 legislation2
software electronic enhance ict1 ict2 integrated poor
transparency enthusiasm corruption articulation conflict
reporting costs clients hinder gov1 gov2 gov3 ethical1
ethical2 consulted roles training eval1 eval2 control
regulations penalise direct communicated sharing conflicts
involved equally support: tab2 implemented X, row cell col exp
chi2
```

```
->  tab2 implemented gender, row cell col exp chi2


-> tabulation of implemented by gender


+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+


implemente |             gender
         d |    Female       Male      Other |     Total
-----------+---------------------------------+----------
        No |         9          4          1 |        14
           |       5.9        7.3        0.8 |      14.0
           |     64.29      28.57       7.14 |    100.00
           |     14.52       5.19      12.50 |      9.52
           |      6.12       2.72       0.68 |      9.52
-----------+---------------------------------+----------
       Yes |        53         73          7 |       133
           |      56.1       69.7        7.2 |     133.0
```

```
           |     39.85      54.89       5.26 |    100.00
           |     85.48      94.81      87.50 |     90.48
           |     36.05      49.66       4.76 |     90.48
-----------+---------------------------------+----------
     Total |        62         77          8 |       147
           |      62.0       77.0        8.0 |     147.0
           |     42.18      52.38       5.44 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     42.18      52.38       5.44 |    100.00

          Pearson chi2(2) =   3.5502   Pr = 0.169

->  tab2 implemented agecat, row cell col exp chi2

-> tabulation of implemented by agecat

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |        agecat
         d |      High        Low |     Total
-----------+----------------------+----------
        No |         1         13 |        14
           |       1.6       12.4 |      14.0
           |      7.14      92.86 |    100.00
           |      5.88      10.00 |      9.52
           |      0.68       8.84 |      9.52
-----------+----------------------+----------
       Yes |        16        117 |       133
           |      15.4      117.6 |     133.0
           |     12.03      87.97 |    100.00
```

```
           |     94.12      90.00 |     90.48
           |     10.88      79.59 |     90.48
-----------+----------------------+----------
     Total |        17        130 |       147
           |      17.0      130.0 |     147.0
           |     11.56      88.44 |    100.00
           |    100.00     100.00 |    100.00
           |     11.56      88.44 |    100.00

          Pearson chi2(1) =   0.2958   Pr = 0.587

->  tab2 implemented position, row cell col exp chi2

-> tabulation of implemented by position

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |                  position
         d |     Buyer       High     Intern        Low |     Total
-----------+--------------------------------------------+----------
        No |         0          1          1         12 |        14
           |       0.1        2.5        0.1       11.3 |      14.0
           |      0.00       7.14       7.14      85.71 |    100.00
           |      0.00       3.85     100.00      10.08 |      9.52
           |      0.00       0.68       0.68       8.16 |      9.52
-----------+--------------------------------------------+----------
       Yes |         1         25          0        107 |       133
           |       0.9       23.5        0.9      107.7 |     133.0
           |      0.75      18.80       0.00      80.45 |    100.00
           |    100.00      96.15       0.00      89.92 |     90.48
```

```
           |      0.68      17.01       0.00      72.79 |     90.48
-----------+--------------------------------------------+----------
     Total |         1         26          1        119 |       147
           |       1.0       26.0        1.0      119.0 |     147.0
           |      0.68      17.69       0.68      80.95 |    100.00
           |    100.00     100.00     100.00     100.00 |    100.00
           |      0.68      17.69       0.68      80.95 |    100.00

          Pearson chi2(3) =  10.6213   Pr = 0.014

->  tab2 implemented educ, row cell col exp chi2

-> tabulation of implemented by educ

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |         educ
         d |      High        Low |     Total
-----------+----------------------+----------
        No |        11          3 |        14
           |       9.2        4.8 |      14.0
           |     78.57      21.43 |    100.00
           |     11.34       6.00 |      9.52
           |      7.48       2.04 |      9.52
-----------+----------------------+----------
       Yes |        86         47 |       133
           |      87.8       45.2 |     133.0
           |     64.66      35.34 |    100.00
           |     88.66      94.00 |     90.48
           |     58.50      31.97 |     90.48
```

```
-----------+----------------------+----------
     Total |        97         50 |       147
           |      97.0       50.0 |     147.0
           |     65.99      34.01 |    100.00
           |    100.00     100.00 |    100.00
           |     65.99      34.01 |    100.00

          Pearson chi2(1) =   1.0919   Pr = 0.296

->  tab2 implemented durempt, row cell col exp chi2

-> tabulation of implemented by durempt

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |        durempt
         d |      Long      Short |     Total
-----------+----------------------+----------
        No |         3         11 |        14
           |       4.7        9.3 |      14.0
           |     21.43      78.57 |    100.00
           |      6.12      11.22 |      9.52
           |      2.04       7.48 |      9.52
-----------+----------------------+----------
       Yes |        46         87 |       133
           |      44.3       88.7 |     133.0
           |     34.59      65.41 |    100.00
           |     93.88      88.78 |     90.48
           |     31.29      59.18 |     90.48
-----------+----------------------+----------
```

```
     Total |        49         98 |       147 
           |      49.0       98.0 |     147.0 
           |     33.33      66.67 |    100.00 
           |    100.00     100.00 |    100.00 
           |     33.33      66.67 |    100.00 

          Pearson chi2(1) =   0.9868   Pr = 0.321

->  tab2 implemented policy, row cell col exp chi2

-> tabulation of implemented by policy

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |   policy
         d |       Yes |     Total
-----------+-----------+----------
        No |        14 |        14 
           |      14.0 |      14.0 
           |    100.00 |    100.00 
           |      9.52 |      9.52 
           |      9.52 |      9.52 
-----------+-----------+----------
       Yes |       133 |       133 
           |     133.0 |     133.0 
           |    100.00 |    100.00 
           |     90.48 |     90.48 
           |     90.48 |     90.48 
-----------+-----------+----------
     Total |       147 |       147 
```

```
           |     147.0 |     147.0
           |    100.00 |    100.00
           |    100.00 |    100.00
           |    100.00 |    100.00

->  tab2 implemented treasury, row cell col exp chi2

-> tabulation of implemented by treasury

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |       treasury
         d |        No        Yes |     Total
-----------+----------------------+----------
        No |         2         12 |        14
           |       1.1       12.9 |      14.0
           |     14.29      85.71 |    100.00
           |     16.67       8.89 |      9.52
           |      1.36       8.16 |      9.52
-----------+----------------------+----------
       Yes |        10        123 |       133
           |      10.9      122.1 |     133.0
           |      7.52      92.48 |    100.00
           |     83.33      91.11 |     90.48
           |      6.80      83.67 |     90.48
-----------+----------------------+----------
     Total |        12        135 |       147
           |      12.0      135.0 |     147.0
           |      8.16      91.84 |    100.00
           |    100.00     100.00 |    100.00
```

```
           |      8.16      91.84 |    100.00

          Pearson chi2(1) =   0.7737   Pr = 0.379

->  tab2 implemented reviewed, row cell col exp chi2

-> tabulation of implemented by reviewed

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |       reviewed
         d |        No        Yes |     Total
-----------+----------------------+----------
        No |         2         12 |        14
           |       2.4       11.6 |      14.0
           |     14.29      85.71 |    100.00
           |      8.00       9.84 |      9.52
           |      1.36       8.16 |      9.52
-----------+----------------------+----------
       Yes |        23        110 |       133
           |      22.6      110.4 |     133.0
           |     17.29      82.71 |    100.00
           |     92.00      90.16 |     90.48
           |     15.65      74.83 |     90.48
-----------+----------------------+----------
     Total |        25        122 |       147
           |      25.0      122.0 |     147.0
           |     17.01      82.99 |    100.00
           |    100.00     100.00 |    100.00
           |     17.01      82.99 |    100.00
```

```
          Pearson chi2(1) =   0.0812   Pr = 0.776

->  tab2 implemented cover, row cell col exp chi2

-> tabulation of implemented by cover

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |         cover
         d |        No        Yes |     Total
-----------+----------------------+----------
        No |         6          8 |        14
           |       2.6       11.4 |      14.0
           |     42.86      57.14 |    100.00
           |     22.22       6.67 |      9.52
           |      4.08       5.44 |      9.52
-----------+----------------------+----------
       Yes |        21        112 |       133
           |      24.4      108.6 |     133.0
           |     15.79      84.21 |    100.00
           |     77.78      93.33 |     90.48
           |     14.29      76.19 |     90.48
-----------+----------------------+----------
     Total |        27        120 |       147
           |      27.0      120.0 |     147.0
           |     18.37      81.63 |    100.00
           |    100.00     100.00 |    100.00
           |     18.37      81.63 |    100.00
```

```
          Pearson chi2(1) =   6.1895   Pr = 0.043

->  tab2 implemented aware, row cell col exp chi2

-> tabulation of implemented by aware

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |         aware
         d |        No        Yes |     Total
-----------+----------------------+----------
        No |         8          6 |        14
           |       2.8       11.2 |      14.0
           |     57.14      42.86 |    100.00
           |     27.59       5.08 |      9.52
           |      5.44       4.08 |      9.52
-----------+----------------------+----------
       Yes |        21        112 |       133
           |      26.2      106.8 |     133.0
           |     15.79      84.21 |    100.00
           |     72.41      94.92 |     90.48
           |     14.29      76.19 |     90.48
-----------+----------------------+----------
     Total |        29        118 |       147
           |      29.0      118.0 |     147.0
           |     19.73      80.27 |    100.00
           |    100.00     100.00 |    100.00
           |     19.73      80.27 |    100.00

          Pearson chi2(1) =  13.6785   Pr = 0.000
```

```
->  tab2 implemented budgeted, row cell col exp chi2

-> tabulation of implemented by budgeted

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             budgeted
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         3         10          1 |        14
           |       2.5        8.5        3.0 |      14.0
           |     21.43      71.43       7.14 |    100.00
           |     11.54      11.24       3.13 |      9.52
           |      2.04       6.80       0.68 |      9.52
-----------+---------------------------------+----------
       Yes |        23         79         31 |       133
           |      23.5       80.5       29.0 |     133.0
           |     17.29      59.40      23.31 |    100.00
           |     88.46      88.76      96.88 |     90.48
           |     15.65      53.74      21.09 |     90.48
-----------+---------------------------------+----------
     Total |        26         89         32 |       147
           |      26.0       89.0       32.0 |     147.0
           |     17.69      60.54      21.77 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     17.69      60.54      21.77 |    100.00

          Pearson chi2(2) =   1.9458   Pr = 0.378
```

```
->  tab2 implemented aligned, row cell col exp chi2

-> tabulation of implemented by aligned

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             aligned
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         5          7          2 |        14
           |       1.6        7.4        5.0 |      14.0
           |     35.71      50.00      14.29 |    100.00
           |     29.41       8.97       3.85 |      9.52
           |      3.40       4.76       1.36 |      9.52
-----------+---------------------------------+----------
       Yes |        12         71         50 |       133
           |      15.4       70.6       47.0 |     133.0
           |      9.02      53.38      37.59 |    100.00
           |     70.59      91.03      96.15 |     90.48
           |      8.16      48.30      34.01 |     90.48
-----------+---------------------------------+----------
     Total |        17         78         52 |       147
           |      17.0       78.0       52.0 |     147.0
           |     11.56      53.06      35.37 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     11.56      53.06      35.37 |    100.00

          Pearson chi2(2) =   9.7761   Pr = 0.008

->  tab2 implemented planned, row cell col exp chi2
```

```
-> tabulation of implemented by planned

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            planned
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         4          5          5 |        14
           |       3.4        4.4        6.2 |      14.0
           |     28.57      35.71      35.71 |    100.00
           |     11.11      10.87       7.69 |      9.52
           |      2.72       3.40       3.40 |      9.52
-----------+--------------------------------+----------
       Yes |        32         41         60 |       133
           |      32.6       41.6       58.8 |     133.0
           |     24.06      30.83      45.11 |    100.00
           |     88.89      89.13      92.31 |     90.48
           |     21.77      27.89      40.82 |     90.48
-----------+--------------------------------+----------
     Total |        36         46         65 |       147
           |      36.0       46.0       65.0 |     147.0
           |     24.49      31.29      44.22 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     24.49      31.29      44.22 |    100.00

          Pearson chi2(2) =   0.4550   Pr = 0.797

->  tab2 implemented approved, row cell col exp chi2
```

```
-> tabulation of implemented by approved

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             approved
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         6          6          2 |        14
           |       3.6        7.1        3.2 |      14.0
           |     42.86      42.86      14.29 |    100.00
           |     15.79       8.00       5.88 |      9.52
           |      4.08       4.08       1.36 |      9.52
-----------+--------------------------------+----------
       Yes |        32         69         32 |       133
           |      34.4       67.9       30.8 |     133.0
           |     24.06      51.88      24.06 |    100.00
           |     84.21      92.00      94.12 |     90.48
           |     21.77      46.94      21.77 |     90.48
-----------+--------------------------------+----------
     Total |        38         75         34 |       147
           |      38.0       75.0       34.0 |     147.0
           |     25.85      51.02      23.13 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     25.85      51.02      23.13 |    100.00

          Pearson chi2(2) =   2.4566   Pr = 0.293

->  tab2 implemented trained, row cell col exp chi2

-> tabulation of implemented by trained
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             trained
         d |        No        Yes        Yes |     Total
-----------+---------------------------------+----------
        No |         6          6          2 |        14
           |       2.5        7.3        4.2 |      14.0
           |     42.86      42.86      14.29 |    100.00
           |     23.08       7.79       4.55 |      9.52
           |      4.08       4.08       1.36 |      9.52
-----------+---------------------------------+----------
       Yes |        20         71         42 |       133
           |      23.5       69.7       39.8 |     133.0
           |     15.04      53.38      31.58 |    100.00
           |     76.92      92.21      95.45 |     90.48
           |     13.61      48.30      28.57 |     90.48
-----------+---------------------------------+----------
     Total |        26         77         44 |       147
           |      26.0       77.0       44.0 |     147.0
           |     17.69      52.38      29.93 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     17.69      52.38      29.93 |    100.00

          Pearson chi2(2) =   7.0760   Pr = 0.029

->  tab2 implemented privy, row cell col exp chi2

-> tabulation of implemented by privy
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             privy
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         6          4          4 |        14
           |       2.3        6.7        5.0 |      14.0
           |     42.86      28.57      28.57 |    100.00
           |     25.00       5.71       7.55 |      9.52
           |      4.08       2.72       2.72 |      9.52
-----------+---------------------------------+----------
       Yes |        18         66         49 |       133
           |      21.7       63.3       48.0 |     133.0
           |     13.53      49.62      36.84 |    100.00
           |     75.00      94.29      92.45 |     90.48
           |     12.24      44.90      33.33 |     90.48
-----------+---------------------------------+----------
     Total |        24         70         53 |       147
           |      24.0       70.0       53.0 |     147.0
           |     16.33      47.62      36.05 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     16.33      47.62      36.05 |    100.00

          Pearson chi2(2) =   8.0903   Pr = 0.018

->  tab2 implemented lacktrain, row cell col exp chi2

-> tabulation of implemented by lacktrain

+--------------------+
```

```
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           lacktrain
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         5          4          5 |        14
           |       3.4        5.0        5.5 |      14.0
           |     35.71      28.57      35.71 |    100.00
           |     13.89       7.55       8.62 |      9.52
           |      3.40       2.72       3.40 |      9.52
-----------+---------------------------------+----------
       Yes |        31         49         53 |       133
           |      32.6       48.0       52.5 |     133.0
           |     23.31      36.84      39.85 |    100.00
           |     86.11      92.45      91.38 |     90.48
           |     21.09      33.33      36.05 |     90.48
-----------+---------------------------------+----------
     Total |        36         53         58 |       147
           |      36.0       53.0       58.0 |     147.0
           |     24.49      36.05      39.46 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     24.49      36.05      39.46 |    100.00

          Pearson chi2(2) =   1.0913   Pr = 0.579

->  tab2 implemented uncoordinated, row cell col exp chi2

-> tabulation of implemented by uncoordinated

+--------------------+
| Key                |
```

```
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |          uncoordinated
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         3          6          5 |        14
           |       3.3        5.5        5.1 |      14.0
           |     21.43      42.86      35.71 |    100.00
           |      8.57      10.34       9.26 |      9.52
           |      2.04       4.08       3.40 |      9.52
-----------+--------------------------------+----------
       Yes |        32         52         49 |       133
           |      31.7       52.5       48.9 |     133.0
           |     24.06      39.10      36.84 |    100.00
           |     91.43      89.66      90.74 |     90.48
           |     21.77      35.37      33.33 |     90.48
-----------+--------------------------------+----------
     Total |        35         58         54 |       147
           |      35.0       58.0       54.0 |     147.0
           |     23.81      39.46      36.73 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     23.81      39.46      36.73 |    100.00

          Pearson chi2(2) =   0.0866   Pr = 0.958

->  tab2 implemented legislation1, row cell col exp chi2

-> tabulation of implemented by legislation1

+--------------------+
| Key                |
|--------------------|
```

```
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           legislation1
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         4          4          6 |        14 
           |       4.2        4.7        5.1 |      14.0 
           |     28.57      28.57      42.86 |    100.00 
           |      9.09       8.16      11.11 |      9.52 
           |      2.72       2.72       4.08 |      9.52 
-----------+--------------------------------+----------
       Yes |        40         45         48 |       133 
           |      39.8       44.3       48.9 |     133.0 
           |     30.08      33.83      36.09 |    100.00 
           |     90.91      91.84      88.89 |     90.48 
           |     27.21      30.61      32.65 |     90.48 
-----------+--------------------------------+----------
     Total |        44         49         54 |       147 
           |      44.0       49.0       54.0 |     147.0 
           |     29.93      33.33      36.73 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
           |     29.93      33.33      36.73 |    100.00 

          Pearson chi2(2) =   0.2727   Pr = 0.873

->  tab2 implemented legislation2, row cell col exp chi2

-> tabulation of implemented by legislation2

+--------------------+
| Key                |
|--------------------|
|     frequency      |
```

```
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           legislation2
         d |        No        Yes        Yes |     Total
-----------+---------------------------------+----------
        No |         2          4          8 |        14
           |       1.6        6.5        5.9 |      14.0
           |     14.29      28.57      57.14 |    100.00
           |     11.76       5.88      12.90 |      9.52
           |      1.36       2.72       5.44 |      9.52
-----------+---------------------------------+----------
       Yes |        15         64         54 |       133
           |      15.4       61.5       56.1 |     133.0
           |     11.28      48.12      40.60 |    100.00
           |     88.24      94.12      87.10 |     90.48
           |     10.20      43.54      36.73 |     90.48
-----------+---------------------------------+----------
     Total |        17         68         62 |       147
           |      17.0       68.0       62.0 |     147.0
           |     11.56      46.26      42.18 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     11.56      46.26      42.18 |    100.00

          Pearson chi2(2) =   1.9672   Pr = 0.374

->  tab2 implemented software, row cell col exp chi2

-> tabulation of implemented by software

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
```

```
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             software
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         8          3          3 |        14
           |       5.8        5.7        2.5 |      14.0
           |     57.14      21.43      21.43 |    100.00
           |     13.11       5.00      11.54 |      9.52
           |      5.44       2.04       2.04 |      9.52
-----------+--------------------------------+----------
       Yes |        53         57         23 |       133
           |      55.2       54.3       23.5 |     133.0
           |     39.85      42.86      17.29 |    100.00
           |     86.89      95.00      88.46 |     90.48
           |     36.05      38.78      15.65 |     90.48
-----------+--------------------------------+----------
     Total |        61         60         26 |       147
           |      61.0       60.0       26.0 |     147.0
           |     41.50      40.82      17.69 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     41.50      40.82      17.69 |    100.00

          Pearson chi2(2) =   2.4603   Pr = 0.292

->  tab2 implemented electronic, row cell col exp chi2

-> tabulation of implemented by electronic

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
```

```
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            electronic
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |        11          0          3 |        14
           |       5.9        3.9        4.2 |      14.0
           |     78.57       0.00      21.43 |    100.00
           |     17.74       0.00       6.82 |      9.52
           |      7.48       0.00       2.04 |      9.52
-----------+---------------------------------+----------
       Yes |        51         41         41 |       133
           |      56.1       37.1       39.8 |     133.0
           |     38.35      30.83      30.83 |    100.00
           |     82.26     100.00      93.18 |     90.48
           |     34.69      27.89      27.89 |     90.48
-----------+---------------------------------+----------
     Total |        62         41         44 |       147
           |      62.0       41.0       44.0 |     147.0
           |     42.18      27.89      29.93 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     42.18      27.89      29.93 |    100.00

          Pearson chi2(2) =   9.5491   Pr = 0.009

->  tab2 implemented enhance, row cell col exp chi2

-> tabulation of implemented by enhance

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
```

```
|  cell percentage   |
+--------------------+

implemente |                   enhance
        d |        No         No         Yes        Yes  |     Total
-----------+--------------------------------------------+----------
       No |         7          1          3          3 |        14
          |       5.5        0.2        4.3        4.0 |      14.0
          |     50.00       7.14      21.43      21.43 |    100.00
          |     12.07      50.00       6.67       7.14 |      9.52
          |      4.76       0.68       2.04       2.04 |      9.52
-----------+--------------------------------------------+----------
      Yes |        51          1         42         39 |       133
          |      52.5        1.8       40.7       38.0 |     133.0
          |     38.35       0.75      31.58      29.32 |    100.00
          |     87.93      50.00      93.33      92.86 |     90.48
          |     34.69       0.68      28.57      26.53 |     90.48
-----------+--------------------------------------------+----------
    Total |        58          2         45         42 |       147
          |      58.0        2.0       45.0       42.0 |     147.0
          |     39.46       1.36      30.61      28.57 |    100.00
          |    100.00     100.00     100.00     100.00 |    100.00
          |     39.46       1.36      30.61      28.57 |    100.00

          Pearson chi2(3) =   4.9413   Pr = 0.176

->  tab2 implemented ict1, row cell col exp chi2

-> tabulation of implemented by ict1

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
```

```
+--------------------+

implemente |              ict1
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         8          3          3 |        14
           |       5.3        4.9        3.8 |      14.0
           |     57.14      21.43      21.43 |    100.00
           |     14.29       5.88       7.50 |      9.52
           |      5.44       2.04       2.04 |      9.52
-----------+--------------------------------+----------
       Yes |        48         48         37 |       133
           |      50.7       46.1       36.2 |     133.0
           |     36.09      36.09      27.82 |    100.00
           |     85.71      94.12      92.50 |     90.48
           |     32.65      32.65      25.17 |     90.48
-----------+--------------------------------+----------
     Total |        56         51         40 |       147
           |      56.0       51.0       40.0 |     147.0
           |     38.10      34.69      27.21 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     38.10      34.69      27.21 |    100.00

          Pearson chi2(2) =   2.4486   Pr = 0.294

->  tab2 implemented ict2, row cell col exp chi2

-> tabulation of implemented by ict2

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+
```

```
implemente |               ict2
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         4          7          3 |        14
           |       6.1        4.4        3.5 |      14.0
           |     28.57      50.00      21.43 |    100.00
           |      6.25      15.22       8.11 |      9.52
           |      2.72       4.76       2.04 |      9.52
-----------+--------------------------------+----------
       Yes |        60         39         34 |       133
           |      57.9       41.6       33.5 |     133.0
           |     45.11      29.32      25.56 |    100.00
           |     93.75      84.78      91.89 |     90.48
           |     40.82      26.53      23.13 |     90.48
-----------+--------------------------------+----------
     Total |        64         46         37 |       147
           |      64.0       46.0       37.0 |     147.0
           |     43.54      31.29      25.17 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     43.54      31.29      25.17 |    100.00

          Pearson chi2(2) =   2.6127   Pr = 0.271

->  tab2 implemented integrated, row cell col exp chi2

-> tabulation of implemented by integrated

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+-------------------+
```

```
implemente |             integrated
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         4          6          4 |        14
           |       3.4        6.2        4.4 |      14.0
           |     28.57      42.86      28.57 |    100.00
           |     11.11       9.23       8.70 |      9.52
           |      2.72       4.08       2.72 |      9.52
-----------+---------------------------------+----------
       Yes |        32         59         42 |       133
           |      32.6       58.8       41.6 |     133.0
           |     24.06      44.36      31.58 |    100.00
           |     88.89      90.77      91.30 |     90.48
           |     21.77      40.14      28.57 |     90.48
-----------+---------------------------------+----------
     Total |        36         65         46 |       147
           |      36.0       65.0       46.0 |     147.0
           |     24.49      44.22      31.29 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     24.49      44.22      31.29 |    100.00

          Pearson chi2(2) =   0.1484   Pr = 0.929

->  tab2 implemented poor, row cell col exp chi2

-> tabulation of implemented by poor

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |                poor
```

```
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         4          6          4 |        14 
           |       4.2        6.6        3.2 |      14.0 
           |     28.57      42.86      28.57 |    100.00 
           |      9.09       8.70      11.76 |      9.52 
           |      2.72       4.08       2.72 |      9.52 
-----------+---------------------------------+----------
       Yes |        40         63         30 |       133 
           |      39.8       62.4       30.8 |     133.0 
           |     30.08      47.37      22.56 |    100.00 
           |     90.91      91.30      88.24 |     90.48 
           |     27.21      42.86      20.41 |     90.48 
-----------+---------------------------------+----------
     Total |        44         69         34 |       147 
           |      44.0       69.0       34.0 |     147.0 
           |     29.93      46.94      23.13 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
           |     29.93      46.94      23.13 |    100.00 

          Pearson chi2(2) =   0.2626   Pr = 0.877

->  tab2 implemented transparency, row cell col exp chi2

-> tabulation of implemented by transparency

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           transparency
         d |        No        Yes        Yes  |     Total
```

```
-----------+---------------------------------+----------
        No |         6          6          2 |        14
           |       5.8        4.4        3.8 |      14.0
           |     42.86      42.86      14.29 |    100.00
           |      9.84      13.04       5.00 |      9.52
           |      4.08       4.08       1.36 |      9.52
-----------+---------------------------------+----------
       Yes |        55         40         38 |       133
           |      55.2       41.6       36.2 |     133.0
           |     41.35      30.08      28.57 |    100.00
           |     90.16      86.96      95.00 |     90.48
           |     37.41      27.21      25.85 |     90.48
-----------+---------------------------------+----------
     Total |        61         46         40 |       147
           |      61.0       46.0       40.0 |     147.0
           |     41.50      31.29      27.21 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     41.50      31.29      27.21 |    100.00

          Pearson chi2(2) =   1.6182   Pr = 0.445

->  tab2 implemented enthusiasm, row cell col exp chi2

-> tabulation of implemented by enthusiasm

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            enthusiasm
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
```

```
        No |         1          6          7 |        14 
           |       2.3        6.5        5.2 |      14.0 
           |      7.14      42.86      50.00 |    100.00 
           |      4.17       8.82      12.73 |      9.52 
           |      0.68       4.08       4.76 |      9.52 
-----------+---------------------------------+----------
       Yes |        23         62         48 |       133 
           |      21.7       61.5       49.8 |     133.0 
           |     17.29      46.62      36.09 |    100.00 
           |     95.83      91.18      87.27 |     90.48 
           |     15.65      42.18      32.65 |     90.48 
-----------+---------------------------------+----------
     Total |        24         68         55 |       147 
           |      24.0       68.0       55.0 |     147.0 
           |     16.33      46.26      37.41 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
           |     16.33      46.26      37.41 |    100.00 

          Pearson chi2(2) =   1.4931   Pr = 0.474

->  tab2 implemented corruption, row cell col exp chi2

-> tabulation of implemented by corruption

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            corruption
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         2         10          2 |        14 
```

```
           |       3.0        6.6        4.5 |      14.0 
           |     14.29      71.43      14.29 |    100.00 
           |      6.45      14.49       4.26 |      9.52 
           |      1.36       6.80       1.36 |      9.52 
-----------+---------------------------------+----------
       Yes |        29         59         45 |       133 
           |      28.0       62.4       42.5 |     133.0 
           |     21.80      44.36      33.83 |    100.00 
           |     93.55      85.51      95.74 |     90.48 
           |     19.73      40.14      30.61 |     90.48 
-----------+---------------------------------+----------
     Total |        31         69         47 |       147 
           |      31.0       69.0       47.0 |     147.0 
           |     21.09      46.94      31.97 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
           |     21.09      46.94      31.97 |    100.00 

          Pearson chi2(2) =   3.8307   Pr = 0.147

->  tab2 implemented articulation, row cell col exp chi2

-> tabulation of implemented by articulation

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           articulation
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         8          3          3 |        14 
           |       5.1        4.1        4.8 |      14.0 
```

```
           |     57.14      21.43      21.43 |    100.00
           |     14.81       6.98       6.00 |      9.52
           |      5.44       2.04       2.04 |      9.52
-----------+---------------------------------+----------
       Yes |        46         40         47 |       133
           |      48.9       38.9       45.2 |     133.0
           |     34.59      30.08      35.34 |    100.00
           |     85.19      93.02      94.00 |     90.48
           |     31.29      27.21      31.97 |     90.48
-----------+---------------------------------+----------
     Total |        54         43         50 |       147
           |      54.0       43.0       50.0 |     147.0
           |     36.73      29.25      34.01 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     36.73      29.25      34.01 |    100.00

          Pearson chi2(2) =   2.7987   Pr = 0.247

->  tab2 implemented conflict, row cell col exp chi2

-> tabulation of implemented by conflict

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            conflict
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         4          3          7 |        14
           |       2.9        5.8        5.3 |      14.0
           |     28.57      21.43      50.00 |    100.00
```

```
           |     13.33       4.92      12.50 |      9.52
           |      2.72       2.04       4.76 |      9.52
-----------+---------------------------------+----------
       Yes |        26         58         49 |       133
           |      27.1       55.2       50.7 |     133.0
           |     19.55      43.61      36.84 |    100.00
           |     86.67      95.08      87.50 |     90.48
           |     17.69      39.46      33.33 |     90.48
-----------+---------------------------------+----------
     Total |        30         61         56 |       147
           |      30.0       61.0       56.0 |     147.0
           |     20.41      41.50      38.10 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     20.41      41.50      38.10 |    100.00

          Pearson chi2(2) =   2.5826   Pr = 0.275

->  tab2 implemented reporting, row cell col exp chi2

-> tabulation of implemented by reporting

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            reporting
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         3          8          3 |        14
           |       3.8        5.9        4.3 |      14.0
           |     21.43      57.14      21.43 |    100.00
           |      7.50      12.90       6.67 |      9.52
```

```
           |      2.04       5.44       2.04 |      9.52
-----------+---------------------------------+----------
       Yes |        37         54         42 |       133
           |      36.2       56.1       40.7 |     133.0
           |     27.82      40.60      31.58 |    100.00
           |     92.50      87.10      93.33 |     90.48
           |     25.17      36.73      28.57 |     90.48
-----------+---------------------------------+----------
     Total |        40         62         45 |       147
           |      40.0       62.0       45.0 |     147.0
           |     27.21      42.18      30.61 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     27.21      42.18      30.61 |    100.00

          Pearson chi2(2) =   1.4382   Pr = 0.487

->  tab2 implemented costs, row cell col exp chi2

-> tabulation of implemented by costs

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              costs
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         9          4          1 |        14
           |       4.8        6.6        2.7 |      14.0
           |     64.29      28.57       7.14 |    100.00
           |     18.00       5.80       3.57 |      9.52
           |      6.12       2.72       0.68 |      9.52
```

```
-----------+---------------------------------+----------
       Yes |        41         65         27 |       133
           |      45.2       62.4       25.3 |     133.0
           |     30.83      48.87      20.30 |    100.00
           |     82.00      94.20      96.43 |     90.48
           |     27.89      44.22      18.37 |     90.48
-----------+---------------------------------+----------
     Total |        50         69         28 |       147
           |      50.0       69.0       28.0 |     147.0
           |     34.01      46.94      19.05 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     34.01      46.94      19.05 |    100.00

          Pearson chi2(2) =   6.4324   Pr = 0.040

->  tab2 implemented clients, row cell col exp chi2

-> tabulation of implemented by clients

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             clients
         d |        No        Yes        Yes |     Total
-----------+---------------------------------+----------
        No |         4          8          2 |        14
           |       4.7        5.4        3.9 |      14.0
           |     28.57      57.14      14.29 |    100.00
           |      8.16      14.04       4.88 |      9.52
           |      2.72       5.44       1.36 |      9.52
-----------+---------------------------------+----------
```

```
       Yes |        45         49         39 |       133 
           |      44.3       51.6       37.1 |     133.0 
           |     33.83      36.84      29.32 |    100.00 
           |     91.84      85.96      95.12 |     90.48 
           |     30.61      33.33      26.53 |     90.48 
-----------+---------------------------------+----------
     Total |        49         57         41 |       147 
           |      49.0       57.0       41.0 |     147.0 
           |     33.33      38.78      27.89 |    100.00 
           |    100.00     100.00     100.00 |    100.00 
           |     33.33      38.78      27.89 |    100.00 

          Pearson chi2(2) =   2.4785   Pr = 0.290

->  tab2 implemented hinder, row cell col exp chi2

-> tabulation of implemented by hinder

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              hinder
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         5          5          4 |        14 
           |       4.6        5.1        4.3 |      14.0 
           |     35.71      35.71      28.57 |    100.00 
           |     10.42       9.26       8.89 |      9.52 
           |      3.40       3.40       2.72 |      9.52 
-----------+---------------------------------+----------
       Yes |        43         49         41 |       133 
```

```
           |      43.4       48.9       40.7 |     133.0
           |     32.33      36.84      30.83 |    100.00
           |     89.58      90.74      91.11 |     90.48
           |     29.25      33.33      27.89 |     90.48
-----------+---------------------------------+----------
     Total |        48         54         45 |       147
           |      48.0       54.0       45.0 |     147.0
           |     32.65      36.73      30.61 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     32.65      36.73      30.61 |    100.00

          Pearson chi2(2) =   0.0698   Pr = 0.966

->  tab2 implemented gov1, row cell col exp chi2

-> tabulation of implemented by gov1

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              gov1
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         2          9          3 |        14
           |       1.8        8.4        3.8 |      14.0
           |     14.29      64.29      21.43 |    100.00
           |     10.53      10.23       7.50 |      9.52
           |      1.36       6.12       2.04 |      9.52
-----------+---------------------------------+----------
       Yes |        17         79         37 |       133
           |      17.2       79.6       36.2 |     133.0
```

```
           |     12.78      59.40      27.82 |    100.00
           |     89.47      89.77      92.50 |     90.48
           |     11.56      53.74      25.17 |     90.48
-----------+---------------------------------+----------
     Total |        19         88         40 |       147
           |      19.0       88.0       40.0 |     147.0
           |     12.93      59.86      27.21 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     12.93      59.86      27.21 |    100.00

          Pearson chi2(2) =   0.2628   Pr = 0.877

->  tab2 implemented gov2, row cell col exp chi2

-> tabulation of implemented by gov2

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |               gov2
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         2          8          4 |        14
           |       2.4        6.6        5.0 |      14.0
           |     14.29      57.14      28.57 |    100.00
           |      8.00      11.59       7.55 |      9.52
           |      1.36       5.44       2.72 |      9.52
-----------+---------------------------------+----------
       Yes |        23         61         49 |       133
           |      22.6       62.4       48.0 |     133.0
           |     17.29      45.86      36.84 |    100.00
```

```
           |     92.00      88.41      92.45 |     90.48
           |     15.65      41.50      33.33 |     90.48
-----------+---------------------------------+----------
     Total |        25         69         53 |       147
           |      25.0       69.0       53.0 |     147.0
           |     17.01      46.94      36.05 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     17.01      46.94      36.05 |    100.00

          Pearson chi2(2) =   0.6509   Pr = 0.722

->  tab2 implemented gov3, row cell col exp chi2

-> tabulation of implemented by gov3

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |               gov3
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         6          5          3 |        14
           |       3.3        7.0        3.7 |      14.0
           |     42.86      35.71      21.43 |    100.00
           |     17.14       6.85       7.69 |      9.52
           |      4.08       3.40       2.04 |      9.52
-----------+---------------------------------+----------
       Yes |        29         68         36 |       133
           |      31.7       66.0       35.3 |     133.0
           |     21.80      51.13      27.07 |    100.00
           |     82.86      93.15      92.31 |     90.48
```

```
           |     19.73      46.26      24.49 |     90.48
-----------+---------------------------------+----------
     Total |        35         73         39 |       147
           |      35.0       73.0       39.0 |     147.0
           |     23.81      49.66      26.53 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     23.81      49.66      26.53 |    100.00

          Pearson chi2(2) =   3.1157   Pr = 0.211

->  tab2 implemented ethical1, row cell col exp chi2

-> tabulation of implemented by ethical1

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             ethical1
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         4          8          2 |        14
           |       2.9        7.5        3.6 |      14.0
           |     28.57      57.14      14.29 |    100.00
           |     13.33      10.13       5.26 |      9.52
           |      2.72       5.44       1.36 |      9.52
-----------+---------------------------------+----------
       Yes |        26         71         36 |       133
           |      27.1       71.5       34.4 |     133.0
           |     19.55      53.38      27.07 |    100.00
           |     86.67      89.87      94.74 |     90.48
           |     17.69      48.30      24.49 |     90.48
```

```
-----------+---------------------------------+----------
     Total |        30         79         38 |       147
           |      30.0       79.0       38.0 |     147.0
           |     20.41      53.74      25.85 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     20.41      53.74      25.85 |    100.00

          Pearson chi2(2) =   1.3391   Pr = 0.512

->  tab2 implemented ethical2, row cell col exp chi2

-> tabulation of implemented by ethical2

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             ethical2
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         2          6          6 |        14
           |       1.4        7.4        5.1 |      14.0
           |     14.29      42.86      42.86 |    100.00
           |     13.33       7.69      11.11 |      9.52
           |      1.36       4.08       4.08 |      9.52
-----------+---------------------------------+----------
       Yes |        13         72         48 |       133
           |      13.6       70.6       48.9 |     133.0
           |      9.77      54.14      36.09 |    100.00
           |     86.67      92.31      88.89 |     90.48
           |      8.84      48.98      32.65 |     90.48
-----------+---------------------------------+----------
```

```
     Total |        15         78         54 |       147
           |      15.0       78.0       54.0 |     147.0
           |     10.20      53.06      36.73 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     10.20      53.06      36.73 |    100.00

          Pearson chi2(2) =   0.7142   Pr = 0.700

->  tab2 implemented consulted, row cell col exp chi2

-> tabulation of implemented by consulted

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            consulted
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         6          3          5 |        14
           |       5.0        5.4        3.5 |      14.0
           |     42.86      21.43      35.71 |    100.00
           |     11.32       5.26      13.51 |      9.52
           |      4.08       2.04       3.40 |      9.52
-----------+---------------------------------+----------
       Yes |        47         54         32 |       133
           |      48.0       51.6       33.5 |     133.0
           |     35.34      40.60      24.06 |    100.00
           |     88.68      94.74      86.49 |     90.48
           |     31.97      36.73      21.77 |     90.48
-----------+---------------------------------+----------
     Total |        53         57         37 |       147
```

```
           |      53.0       57.0       37.0 |     147.0
           |     36.05      38.78      25.17 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     36.05      38.78      25.17 |    100.00

          Pearson chi2(2) =   2.0829   Pr = 0.353

->  tab2 implemented roles, row cell col exp chi2

-> tabulation of implemented by roles

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              roles
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         6          3          5 |        14
           |       3.8        6.9        3.3 |      14.0
           |     42.86      21.43      35.71 |    100.00
           |     15.00       4.17      14.29 |      9.52
           |      4.08       2.04       3.40 |      9.52
-----------+---------------------------------+----------
       Yes |        34         69         30 |       133
           |      36.2       65.1       31.7 |     133.0
           |     25.56      51.88      22.56 |    100.00
           |     85.00      95.83      85.71 |     90.48
           |     23.13      46.94      20.41 |     90.48
-----------+---------------------------------+----------
     Total |        40         72         35 |       147
           |      40.0       72.0       35.0 |     147.0
```

```
           |     27.21      48.98      23.81 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     27.21      48.98      23.81 |    100.00

          Pearson chi2(2) =   4.7112   Pr = 0.095

->  tab2 implemented training, row cell col exp chi2

-> tabulation of implemented by training

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             training
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         5          4          5 |        14
           |       3.4        5.5        5.2 |      14.0
           |     35.71      28.57      35.71 |    100.00
           |     14.29       7.02       9.26 |      9.59
           |      3.42       2.74       3.42 |      9.59
-----------+---------------------------------+----------
       Yes |        30         53         49 |       132
           |      31.6       51.5       48.8 |     132.0
           |     22.73      40.15      37.12 |    100.00
           |     85.71      92.98      90.74 |     90.41
           |     20.55      36.30      33.56 |     90.41
-----------+---------------------------------+----------
     Total |        35         57         54 |       146
           |      35.0       57.0       54.0 |     146.0
           |     23.97      39.04      36.99 |    100.00
```

```
           |    100.00     100.00     100.00 |    100.00
           |     23.97      39.04      36.99 |    100.00

          Pearson chi2(2) =   1.3321   Pr = 0.514

->  tab2 implemented eval1, row cell col exp chi2

-> tabulation of implemented by eval1

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             eval1
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         7          3          4 |        14
           |       4.5        6.4        3.1 |      14.0
           |     50.00      21.43      28.57 |    100.00
           |     14.89       4.48      12.12 |      9.52
           |      4.76       2.04       2.72 |      9.52
-----------+--------------------------------+----------
       Yes |        40         64         29 |       133
           |      42.5       60.6       29.9 |     133.0
           |     30.08      48.12      21.80 |    100.00
           |     85.11      95.52      87.88 |     90.48
           |     27.21      43.54      19.73 |     90.48
-----------+--------------------------------+----------
     Total |        47         67         33 |       147
           |      47.0       67.0       33.0 |     147.0
           |     31.97      45.58      22.45 |    100.00
           |    100.00     100.00     100.00 |    100.00
```

```
           |     31.97      45.58      22.45 |    100.00

          Pearson chi2(2) =   3.8111   Pr = 0.149

->  tab2 implemented eval2, row cell col exp chi2

-> tabulation of implemented by eval2

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              eval2
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         1          5          8 |        14
           |       4.2        5.3        4.5 |      14.0
           |      7.14      35.71      57.14 |    100.00
           |      2.27       8.93      17.02 |      9.52
           |      0.68       3.40       5.44 |      9.52
-----------+---------------------------------+----------
       Yes |        43         51         39 |       133
           |      39.8       50.7       42.5 |     133.0
           |     32.33      38.35      29.32 |    100.00
           |     97.73      91.07      82.98 |     90.48
           |     29.25      34.69      26.53 |     90.48
-----------+---------------------------------+----------
     Total |        44         56         47 |       147
           |      44.0       56.0       47.0 |     147.0
           |     29.93      38.10      31.97 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     29.93      38.10      31.97 |    100.00
```

```
          Pearson chi2(2) =   5.7739   Pr = 0.056

->  tab2 implemented control, row cell col exp chi2

-> tabulation of implemented by control

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage  |
| column percentage |
|  cell percentage  |
+-------------------+

implemente |             control
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         5          5          4 |        14
           |       4.0        6.4        3.6 |      14.0
           |     35.71      35.71      28.57 |    100.00
           |     11.90       7.46      10.53 |      9.52
           |      3.40       3.40       2.72 |      9.52
-----------+--------------------------------+----------
       Yes |        37         62         34 |       133
           |      38.0       60.6       34.4 |     133.0
           |     27.82      46.62      25.56 |    100.00
           |     88.10      92.54      89.47 |     90.48
           |     25.17      42.18      23.13 |     90.48
-----------+--------------------------------+----------
     Total |        42         67         38 |       147
           |      42.0       67.0       38.0 |     147.0
           |     28.57      45.58      25.85 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     28.57      45.58      25.85 |    100.00
```

```
          Pearson chi2(2) =   0.6510   Pr = 0.722

->  tab2 implemented regulations, row cell col exp chi2

-> tabulation of implemented by regulations

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |           regulations
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         4          9          1 |        14
           |       3.7        5.9        4.4 |      14.0
           |     28.57      64.29       7.14 |    100.00
           |     10.26      14.52       2.17 |      9.52
           |      2.72       6.12       0.68 |      9.52
-----------+--------------------------------+----------
       Yes |        35         53         45 |       133
           |      35.3       56.1       41.6 |     133.0
           |     26.32      39.85      33.83 |    100.00
           |     89.74      85.48      97.83 |     90.48
           |     23.81      36.05      30.61 |     90.48
-----------+--------------------------------+----------
     Total |        39         62         46 |       147
           |      39.0       62.0       46.0 |     147.0
           |     26.53      42.18      31.29 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     26.53      42.18      31.29 |    100.00

          Pearson chi2(2) =   4.7015   Pr = 0.095
```

```
->  tab2 implemented penalise, row cell col exp chi2

-> tabulation of implemented by penalise

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             penalise
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         8          6          0 |        14
           |       4.0        6.3        3.7 |      14.0
           |     57.14      42.86       0.00 |    100.00
           |     19.05       9.09       0.00 |      9.52
           |      5.44       4.08       0.00 |      9.52
-----------+--------------------------------+----------
       Yes |        34         60         39 |       133
           |      38.0       59.7       35.3 |     133.0
           |     25.56      45.11      29.32 |    100.00
           |     80.95      90.91     100.00 |     90.48
           |     23.13      40.82      26.53 |     90.48
-----------+--------------------------------+----------
     Total |        42         66         39 |       147
           |      42.0       66.0       39.0 |     147.0
           |     28.57      44.90      26.53 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     28.57      44.90      26.53 |    100.00

          Pearson chi2(2) =   8.5407   Pr = 0.015
```

```
->  tab2 implemented direct, row cell col exp chi2

-> tabulation of implemented by direct

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |              direct
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         3          6          5 |        14
           |       3.4        6.6        4.0 |      14.0
           |     21.43      42.86      35.71 |    100.00
           |      8.33       8.70      11.90 |      9.52
           |      2.04       4.08       3.40 |      9.52
-----------+--------------------------------+----------
       Yes |        33         63         37 |       133
           |      32.6       62.4       38.0 |     133.0
           |     24.81      47.37      27.82 |    100.00
           |     91.67      91.30      88.10 |     90.48
           |     22.45      42.86      25.17 |     90.48
-----------+--------------------------------+----------
     Total |        36         69         42 |       147
           |      36.0       69.0       42.0 |     147.0
           |     24.49      46.94      28.57 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     24.49      46.94      28.57 |    100.00

          Pearson chi2(2) =   0.3904   Pr = 0.823

->  tab2 implemented communicated, row cell col exp chi2
```

```
-> tabulation of implemented by communicated

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+-------------------+

implemente |           communicated
         d |        No        Yes        Yes  |     Total
-----------+--------------------------------+----------
        No |         4          4          6 |        14
           |       3.3        6.5        4.2 |      14.0
           |     28.57      28.57      42.86 |    100.00
           |     11.43       5.88      13.64 |      9.52
           |      2.72       2.72       4.08 |      9.52
-----------+--------------------------------+----------
       Yes |        31         64         38 |       133
           |      31.7       61.5       39.8 |     133.0
           |     23.31      48.12      28.57 |    100.00
           |     88.57      94.12      86.36 |     90.48
           |     21.09      43.54      25.85 |     90.48
-----------+--------------------------------+----------
     Total |        35         68         44 |       147
           |      35.0       68.0       44.0 |     147.0
           |     23.81      46.26      29.93 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     23.81      46.26      29.93 |    100.00

          Pearson chi2(2) =   2.0574   Pr = 0.357

->  tab2 implemented sharing, row cell col exp chi2
```

```
-> tabulation of implemented by sharing

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+-------------------+

implemente |            sharing
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         3          5          6 |        14
           |       3.6        5.1        5.2 |      14.0
           |     21.43      35.71      42.86 |    100.00
           |      7.89       9.26      10.91 |      9.52
           |      2.04       3.40       4.08 |      9.52
-----------+---------------------------------+----------
       Yes |        35         49         49 |       133
           |      34.4       48.9       49.8 |     133.0
           |     26.32      36.84      36.84 |    100.00
           |     92.11      90.74      89.09 |     90.48
           |     23.81      33.33      33.33 |     90.48
-----------+---------------------------------+----------
     Total |        38         54         55 |       147
           |      38.0       54.0       55.0 |     147.0
           |     25.85      36.73      37.41 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     25.85      36.73      37.41 |    100.00

          Pearson chi2(2) =   0.2439   Pr = 0.885

->  tab2 implemented conflicts, row cell col exp chi2

-> tabulation of implemented by conflicts
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |            conflicts
         d |        No        Yes        Yes  |     Total
-----------+----------------------------------+----------
        No |         3          8          3 |        14
           |       4.1        6.3        3.6 |      14.0
           |     21.43      57.14      21.43 |    100.00
           |      6.98      12.12       7.89 |      9.52
           |      2.04       5.44       2.04 |      9.52
-----------+----------------------------------+----------
       Yes |        40         58         35 |       133
           |      38.9       59.7       34.4 |     133.0
           |     30.08      43.61      26.32 |    100.00
           |     93.02      87.88      92.11 |     90.48
           |     27.21      39.46      23.81 |     90.48
-----------+----------------------------------+----------
     Total |        43         66         38 |       147
           |      43.0       66.0       38.0 |     147.0
           |     29.25      44.90      25.85 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     29.25      44.90      25.85 |    100.00

          Pearson chi2(2) =   0.9575   Pr = 0.620

->  tab2 implemented involved, row cell col exp chi2

-> tabulation of implemented by involved
```

```
+-------------------+
| Key               |
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+-------------------+

implemente |            involved
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         6          3          5 |        14
           |       5.2        4.6        4.2 |      14.0
           |     42.86      21.43      35.71 |    100.00
           |     10.91       6.25      11.36 |      9.52
           |      4.08       2.04       3.40 |      9.52
-----------+---------------------------------+----------
       Yes |        49         45         39 |       133
           |      49.8       43.4       39.8 |     133.0
           |     36.84      33.83      29.32 |    100.00
           |     89.09      93.75      88.64 |     90.48
           |     33.33      30.61      26.53 |     90.48
-----------+---------------------------------+----------
     Total |        55         48         44 |       147
           |      55.0       48.0       44.0 |     147.0
           |     37.41      32.65      29.93 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     37.41      32.65      29.93 |    100.00

          Pearson chi2(2) =   0.8924   Pr = 0.640

->  tab2 implemented equally, row cell col exp chi2

-> tabulation of implemented by equally

+-------------------+
```

```
| Key                |
|--------------------|
|     frequency      |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+--------------------+

implemente |             equally
         d |        No        Yes        Yes  |     Total
-----------+---------------------------------+----------
        No |         9          4          1 |        14
           |       4.9        5.6        3.5 |      14.0
           |     64.29      28.57       7.14 |    100.00
           |     17.65       6.78       2.70 |      9.52
           |      6.12       2.72       0.68 |      9.52
-----------+---------------------------------+----------
       Yes |        42         55         36 |       133
           |      46.1       53.4       33.5 |     133.0
           |     31.58      41.35      27.07 |    100.00
           |     82.35      93.22      97.30 |     90.48
           |     28.57      37.41      24.49 |     90.48
-----------+---------------------------------+----------
     Total |        51         59         37 |       147
           |      51.0       59.0       37.0 |     147.0
           |     34.69      40.14      25.17 |    100.00
           |    100.00     100.00     100.00 |    100.00
           |     34.69      40.14      25.17 |    100.00

          Pearson chi2(2) =   6.4191   Pr = 0.041

->  tab2 implemented support, row cell col exp chi2

-> tabulation of implemented by support

+--------------------+
| Key                |
```

```
|-------------------|
|     frequency     |
| expected frequency |
|   row percentage   |
| column percentage  |
|  cell percentage   |
+-------------------+

implemente |              support
         d |        No        Yes        Yes  |      Total
-----------+---------------------------------+----------
        No |         6          5          3 |         14
           |       3.2        6.2        4.6 |       14.0
           |     42.86      35.71      21.43 |     100.00
           |     17.65       7.69       6.25 |       9.52
           |      4.08       3.40       2.04 |       9.52
-----------+---------------------------------+----------
       Yes |        28         60         45 |        133
           |      30.8       58.8       43.4 |      133.0
           |     21.05      45.11      33.83 |     100.00
           |     82.35      92.31      93.75 |      90.48
           |     19.05      40.82      30.61 |      90.48
-----------+---------------------------------+----------
     Total |        34         65         48 |        147
           |      34.0       65.0       48.0 |      147.0
           |     23.13      44.22      32.65 |     100.00
           |    100.00     100.00     100.00 |     100.00
           |     23.13      44.22      32.65 |     100.00

          Pearson chi2(2) =   3.4538   Pr = 0.178
```