APPRAISAL OF THE EFFICIENCY OF TENDER ADJUDICATION METHODS IN PUBLIC PROCUREMENT OF CONSTRUCTION PROJECTS IN SOUTH AFRICA

by

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DECLARATION

I, Babalwa Damba, student number 201138786, declare that entire body of work contained in this thesis titled, "*Appraisal of the efficiency of tender adjudication methods in public procurement of construction projects In South Africa*", is my own, original work. I am the sole author thereof (save to the extent explicitly otherwise stated), and reproduction and publication thereof by Cape Peninsula University of Technology will not infringe on any third-party rights. I also do hereby confirm that I have not previously submitted this research entirely or partially for obtaining any qualification.

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ABSTRACT

Due to poor performance caused by non-adherence to proper processes and procedures, procurement performance has for decades attracted the attention of practitioners, academics, and researchers. From observations, it was found that the adjudication process has not been adopted properly by procurement stakeholders. The aim of this research was to investigate the effectiveness of the current tender adjudication methods in public sector procurement in the construction industry of South Africa. A questionnaire was distributed to the Department of Public Works, the Department of Transport, the Department of Human Settlements, and the local government in the Western Cape Province of South Africa. To validate the questionnaire survey, interviews questions were developed and conducted concurrently with the survey. The data were analysed using the Statistical Package for the Social Sciences (SPSS), descriptive statistics, and content analysis.

The findings of the study revealed the following: i) the Supply Chain Management (SCM) team involved in the tender adjudication do not have sufficient knowledge of the Preferential Procurement Policy Framework Act used in the adjudication process to select a suitable contractor; ii) the current tender adjudication method has loopholes that permit corrupt activities in the tender adjudication process; iii) many of the contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project; and iv) the tender adjudication process is perceived as effective in assisting with the selection of a suitable service provider for a construction project.

It was furthermore found that price, points for HDI status/BEE/B-BBEE, and points for youth are important criteria that should be included by contractors to secure projects; however, all the criteria were noted as significant. In the re-allocation process, the respondents noted that functionality, price, and points for youth are significant in the tender adjudication process. With regard to an alternative tender adjudication process, price, functionality, and gender were recognised by the respondents as the most significant criteria for tender adjudication. Knowledge, education, and training were noted in the qualitative findings. The results obtained from this research reveal the efficiency of tender adjudication practices towards achieving sustainable procurement of construction projects in South Africa. This research, based on the efficiency of tender adjudication in the public sector of South Africa, proposes a more comprehensive, effective tender adjudication method. Improvement in terms of the efficiency of tender adjudication are also recommended.

Keywords: Tender adjudication, public procurement, preferential point system, evaluation criteria.

DEDICATION

This thesis is dedicated to my mother, Ms M.B. Damba, who always believed in me and encouraged me to make the right life choices. I would not have been able to accomplish this without my mother's love and support. It has been an honour to fulfil my dream with my kids, Mariam Lubobo, Umuhlenkosi Lubobo, and Sinesipho Lubobo. I am thankful for your support.

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LIST OF ABBREVIATIONS

PPPFA	Preferential Procurement Policy Framework Act
HDI	Historically Disadvantaged Individual
BEE	Black Economic Empowerment
PFMA	Public Finance Management Act
MFMA	Municipal Finance Management Act
CIDB	Construction Industry Development Board
PPP	Public-Private Partnership
B-BBEE	Broad-Based Black Economic Empowerment Act

DEFINITIONS

Term	Definition
Tendering	Providing a set price for a particular project, item, or asset, such as a property, share, or land (Elhag et al., 2005).
Procurement	Procurement refers to the process of sourcing and managing goods, services, or works from external sources to meet the needs of an organisation. This involves identifying the specific product or service requirements, selecting the most suitable supplier, negotiating prices and terms, placing orders, and tracking delivery and fulfilment (Ruparathna & Hewage, 2015).
Adjudication	The process of tender adjudication involves reviewing and assessing bids or proposals that were submitted in response to a tender or solicitation document. The goal is to choose the most suitable bidder who is responsive and responsible for the contract. This information is based on the World Bank's (2017) guidelines.
Client	According to the Joint Contract Tribunal (2016), the client is the one who initiates and oversees the construction project, hiring both consultants and contractors to carry out the design and construction work.
Stakeholders	Stakeholders in a construction project are individuals with either a direct or indirect interest therein. They may include owners, developers, subcontractors, suppliers, government agencies, and the surrounding community (SitePodium, 2023).
Contractor	A contractor refers to a person who's hired to perform certain tasks for a construction project… They essentially work as a manager and serve as the main point of communication for a construction project (Indeed, 2023).
Price	The term "price" pertains to the sum of money that is spent on the labour, materials, and equipment utilised in a construction project (Smith, 2018).
B-BBEE	The South African government has launched the Broad-Based Economic Empowerment initiative with the goal of enhancing economic transformation and providing greater access to opportunities for underprivileged individuals and businesses in the country (Viljoen et al., 2020).
Youth	Within the construction industry, the term "youth" generally applies to those who are between the ages of 18 and 35 and beginning their careers in this field. These individuals may hold entry-level positions like apprenticeships or trade assistants, or they may have completed a construction-related degree or diploma (Cooke et al., 2009).
Disability	Disability is a condition that can affect an individual's ability to perform certain tasks or participate fully in the workplace. It can be physical, mental, or sensory in nature and may be permanent, temporary, or situational (Badi et al., 2018).

CHAPTER ONE: THE PROBLEM AND SETTING

1.1 Background

Public procurement of construction projects in South Africa is an important process in which the government acquires construction services and activities from private sector enterprises (Rogerson, 2018; Caswell, 2021). According to Caswell (2021), the procurement process is driven by a strong regulatory framework that ensures transparency, competition, and value for money. In the United Nations System, procurement amounts to approximately US$ 3.5 billion in goods and US$ 1.6 billion in services (Sakane, 2006). In a similar vein with Lewis (2015) who claims that Procurement processes often include public tendering, Requests for Proposals (RFPs), and Requests for Quotations (RFQs), which are reviewed by various bid committees to guarantee compliance and justice in the procurement process. Despite the highlighted role played by public procurement, in developing nations like South Africa, Angola, Kenya, Ghana, Nigeria, Cuba, Ecuador, Peru, Tunisia, Ukraine, and Fiji public procurement is critical to economic growth and infrastructure development (Volmink, 2014), however, it faces considerable problems such as corruption, limited financial resources, and insufficient legal frameworks (Matemotsa, 2017). Furthermore, Kalwasira (2015) disagreed and stated that Ghana's Public Procurement Authority and Rwanda's e-procurement platform serve as examples of how deliberate changes can result in more equitable and effective procurement procedures. However, Matemotsa (2017) pointed out that the majority of developing countries' procurement processes is hampered by corruption, a lack of openness, limited capacity, and ineffective legal frameworks. Furthermore, Sakane (2006) Highlighted that in the UN the constitution outlines key principles for preventing corruption, including creating public awareness, criminalizing bribery, unifying the procurement code, establishing transparent procedures and practices, opening bids to the public, and delegating authority appropriately.

In the context of the South African public procurement process, in 1995, procurement reform focused on promoting good governance principles and implementing a preferential system to achieve socio-economic objectives (Ambe, 2016). Procurement reform methods were incorporated into the Municipal Financial Management Act 56 of 2003 (MFMA), Public Finance Management Act (PFMA), and Preferential Procurement Policy Framework Act 5 of 2000 (PPPFA). In May 1999, the Department of Public Works (DPW) announced its intention to develop new construction policies aimed at redressing historical imbalances, creating economic growth and competitiveness, enhancing stability, and creating new, sustainable jobs (Mathonsi & Thwala, 2012). However, Caswell (2021) revealed that procurement systems in the construction industry encounter a variety of obstacles while attempting to get projects. These challenges include intense competition, fuelled by limited

possibilities and pricing pressure, needing strategic positioning to gain contracts during bidding wars. In addition, the rigorous tendering process necessitates thorough paperwork and strict timeframes, exacerbating resource constraints, and flexibility is essential since client requirements may change, necessitating a sense of urgency in proposal modifications. Besides this, corruption is currently stifling infrastructure development as well as procurement processes, according to the National Treasury and the Auditor General (Mazibuko, 2020). In addition, Mazibuko (2020) found that the procurement process involves budgets that are funded by taxes, and value for money, professional ethics, ethical leadership, and conflict of interest must all be taken into consideration. In South Africa public procurement is governed by the following statutes: the State Tender Board Act 86 of 1968, the Public Finance Management Act 1 of 1999, the Preferential Procurement Policy Framework Act 5 of 2000, the Construction Industry Board Act 38 of 2000, the Broad-based Black Economic Empowerment Act 53 of 2003, the Municipal Finance Management Act 56 of 2003, and the Prevention and Combating of Corrupt Activities Act 12 of 2004. Although the government has taken these efforts the problems surrounding the procurement system in South Africa still exist. To address this issue, this study aims to investigate the efficiency of the current tender adjudication methods in public procurement in South Africa. Kwon et al. (2016) highlighted the form of the supply chain as follows: petty cash should be used to purchase items up to R2000, quotations should be used to purchase items up to R10,000, formal written price quotations should be used to purchase items up to R30,000, three formal written price quotations should be used to purchase items up to R200,000.

In the construction industry, the tender adjudication process plays a pivotal role in the selection process of the appropriate contractor and during the implementation stage of a project (Kog & Yaman, 2014:411). Quinot (2014) indicates that tender adjudication involves investigating, screening, and deciding if the contractor or bidder can be accepted. According to Hacket and Statham (2016), the tender adjudication process is an important element of procurement and contracting in which proposals or bids presented by interested parties are thoroughly assessed and scrutinised by examining various aspects, including price, technical specifications, quality, and conformity to requirements. In developing nations like Kenya state enterprises have developed protocols that adhere to the guidelines set forth by the Public Procurement Oversight Authority (PPOA) (Nderitu & Karanja, 2018; Mwangi, 2017). Furthermore, the tender adjudication process is conducted before the contract is awarded to the successful contractor, founded on the contractor's expertise, construction knowledge, financial steadiness, current workload, safety techniques, record, and other criteria. As a result, the UN like China, France, Russia, the United Kingdom, and the United States the procedure for evaluating bids and the criteria for selecting a suitable contractor for the construction projects, including the relevance of the bid, technical approach, budget,

and financial viability, organisational capacity, gender, and nationality. However, Ngobeni (2011) and Wasta (2014) argues that tender adjudication success is confronted by the following challenges that includes transparency and fairness, the complexity of evaluation criteria, bidder qualifications, legal compliance, data security, and conflict of interest. Furthermore, a study by Quinot (2014) and Ambe and Badenhorst-Weiss (2012) and Kithatu-Kiwekete and Phillips (2020) have similar findings pertaining to challenges hindering the efficiency of the current tender adjudication process.

The selection of a suitable contractor for the project requires critical decisions in the adjudication process, as it can affect the success of the construction project negatively (Kog & Yaman, 2014:412). This implies that identifying the right contractor is crucial to achieving the best outcome in terms of cost, time, and quality. As noted by Sarker et al. (2012), the contractor for projects must be sensibly selected, considering their knowledge, competence, and skills. Tawil et al. (2013) argue that insufficient contractor knowledge and work capital, poor preparation, late advance payments, and poor site management can contribute to project delays. The selection of a suitable contractor is essential to the success of construction projects, which must be done after careful deliberation.

Omran et al. (2012:18) argue that project delays and the increase in cost for construction projects are often linked to specifications and contractors' qualifications, including financial and technical knowledge as well as contract and type. Additionally, variations between the contractor's bidding price and the next lowest bidder's price are related to the contractor's knowledge (Oyeyipo et al., 2016; Birjandi et al., 2019). Therefore, it can be strongly argued that the implementation of a fair and competitive tender adjudication process to identify a suitable contractor is an essential goal within South Africa's public procurement (Birjandi et al., 2019). Bentall et al. (2003:8) confirm that a procurement system grounded on the Preferential Procurement Policy Framework Act 5 of 2000 (South African Government, 2000) is used by the Construction Industry Development Board (cidb). Watermeyer (2003) indicates that the core goals of the public procurement system are to maximise economy and effectiveness in procurement and to encourage competition among contractors and suppliers within the construction industry. To achieve these goals, a maximum total of 100 points is used as a tender adjudication criteria package, with bids being evaluated based on the allocation of points related to the tendered value, functionality, and preference points (Watermeyer, 2003).

In the 1990s, supply chain management (SCM) became an important element of senior management's agenda (Lambert & Enz, 2017; Fawcett et al., 2008). This has been the argument in the current trends of research. Like, Harland (2013) uncovered that in today's globalized and competitive world, organisations acknowledge the important role of SCM in attaining cost reductions, meeting client's demands, and efficiently managing risks. On the

other hand, Ab Talib and Hamid (2014) and Chen and Paulraj (2004) concurered that the contributions of the supply chain to success include transportation management, organisational factors, increased competition, strong chain relationships and communication, new information technology, economic globalization, product innovation, government support, and more. The findings from Sandberg and Abrahamsson (2010) and Lambert (2008) were similar to those of Ab Talib and Hamid (2014). Although, there are initiatives have been taken to resolve the tender adjudication challenges, however, this problem still exists and there is a need to propose an efficient tender adjudication method that will enable fairness and accountability in the procurement process of the construction industry and align with socio-economic objectives.

1.2 Identification of the study gap

In 2011, the Preferential Procurement Policy Framework Act established the 90/10 and 80/20 scoring methods used to evaluate tender offers to select a competent contractor (Bolton, 2007a). For contractors with the value estimate of R1 million and below, the 80/20 criteria apply, and for contracts with estimates above R1 million, the 90/10 criteria apply. Companies owned by black individuals based on their BEE status level will be awarded the 20 or 10 points, depending on the respective criteria used (Bolton, 2006, 2007a, 2007b). Table 1.1 illustrates the criteria used to award contracts based on the 90/10 criterion, which clearly indicates that 90 of the 100 points are still allocated for price. This means the Preferential Procurement Policy Framework Act (PPPFA), representing the new procurement system meant to promote socio-economic development, still recognises price as an important criterion.

Table 1.1: Tender adjudication criteria (adapted from Watermeyer, 2004)

Specific goals	**Target goals**
• 4 points for HDI status/BEE/B-BBEE • 3 points for gender equity • 2 points for youth • 1 point for disability	• 60 points for the price • 30 points for functionality (quality from references, similar previous experience, availability of own professional staff, availability of working capital, etc.)

The South African public procurement process is known as competitive bidding. According to the South African National treasury (2004:13), competitive bidding, also referred to as open tendering, refers to bidding with no limit where any appropriate skilled bidder may tender for the work. It further emphasises that price is a dominant aspect, as the contract is typically awarded to the lowest bidder. Research studies have revealed that the best price is achieved by having contractors bid for projects, leading to the lowest bid being awarded

the contract (Hughes & Murdoch, 2008:119). Depending on the project's risk and sensitivity, clients are expected to reject the lowest bid. Kumar (2008:125) observes that clients are more likely to reject the lowest bid below the client's estimate, as contractors may lack the necessary funds or may not be financially stable enough to complete the project as planned.

From the client's perspective, Uher and Loosemore (2004) opine that the open tender method is constructive since it is extremely competitive. Additionally, the intense competition contributes to high production effectiveness (Winch, 2010). Furthermore, Griffith et al. (2003:494) argue that the basic reason for the open tender process is the reduction in project costs. However, the lowest bid does not always achieve a cost-effective price, particularly when a project is exposed to a high level of risk. Ofori (1990:144) argues that less is achieved by having numerous bids as it makes the evaluation process dull. Furthermore, not all bidders may possess the capability to complete the project. Several researchers suggest that there is an eminent level of obstruction with competition as it warrants the lowest price (Hughes & Murdoch, 2008:120). Previous studies by the Institute of Civil Engineers regarding competitive open tendering have revealed that the process can be objectionable, leading to unsuccessful tendering that wastes resources and lacks effectiveness. It is possible that tenderers compromise the quality of the project by using low standard materials to meet their profit margin.

Many researchers have found that clients often believe project achievement can only be safeguarded by accepting the lowest priced tender (Huang, 2011:185). Furthermore, Olaniran (2015) notes that selecting an experienced contractor is a primary factor in the successful delivery of a construction project. Therefore, the contractor's abilities—technically, managerial, and financially—have a significant impact on the performance of any project. Given this reality, it is imperative to pay more attention to the selection of contractors for construction projects to ensure that projects perform well in terms of cost, time, and quality.

Client satisfaction can be increased by the successful performance of the contractor, and this will help improve the contractor's reputation. Therefore, it is crucial for the client to take the necessary measures and to accurately select a contractor for the project to be completed successfully. This can only be achieved through the participation of a competent contractor with a good track record and excellent management skills to achieve the project's aim.

During the tender stage, the lowest bid can be very tempting for the client and may result in project managers overlooking other criteria that should receive more attention and priority. The inability of the contractor to finish the project on time will result in quality being

compromised to reduce cost. According to Uher and Loosemore (2004), unavoidable cost overruns and limited resources to effectively control risk due to delays are the result of contractors who operate within a low margin. The possibility is that an incompetent contractor is appointed when selecting a lowest bidder.

Hughes and Murdoch (2008:121) indicate that in many cases, clients select a contractor who may not appreciate the complexity of the project. This can negatively affect the scope of work and have a significant impact on the performance and quality of the work. According to Kwakye (1994), ensuring that the successful bidder possesses the required skills can minimise the risks. Therefore, careful consideration should be given when selecting a contractor during the bidding stage to avoid the difficulty of contractors finishing projects due to exhausted funds (Coombs & Jenkins, 2002).

The endeavour to reduce the inefficiencies of the open tender process stems from understanding the need to improve the performance of construction projects. The success of a construction project is an accomplishment. If a contractor is not selected efficiently, the success of project completion is affected. The South African construction industry has transitioned from ‘lowest-price wins’ to ‘multi-criteria selection’ practices when selecting a suitable contractor. However, despite the increased emphasis on selecting contractors based on value, it has been observed that the tender price still largely influences the final selection decision. To advance and improve the South African construction industry, it is imperative that we recognise the factors affecting the industry and its operations.

Therefore, this research investigates the efficiency and deficiency of the current practice of contractor selection within the PPPFA (South African Government, 2000). The focus of this research is on selecting a contractor that can satisfactorily meet the client’s needs in terms of time, cost, and quality. For this purpose, a contractor selection criteria model that draws inspiration from the Lorenz curve and Gini’s coefficient principle, is considered. This investigation assesses the effectiveness of the contractor selection process and enhances the image of the PPPFA (South African Government, 2000). This approach includes an innovative method for measuring the compliance of the tenderer based on the Lorenz and Gini principle, which measures the inequality of the distribution of income amongst the population. Ndihokubwayo (2019) argues that the current tender adjudication method uses a one-dimensional method, and it does not fully capture the degree of the adjudicated items. It also overlooks the ranking of the level of importance attached to each adjudicated criterion to yield mathematically sound results. Ndihokubwayo (2019) further indicates that capturing the magnitude of the adjudicated criteria by calculating their ranking will help evaluate

compliance to predetermined conditions and may also overcome the shortcomings presented by the one-dimensional scoring method.

1.3 Problem statement

The effectiveness of tender adjudication techniques in public procurement is important to the successful completion of building projects (Morledge, Smith & Appiah, 2021; Douh, 2015; Mantzaris, 2014). Morledge, Smith and Appiah (2021) pointed out that South Africa's building industry is critical to economic growth and infrastructure development. However, present tender adjudication systems in public procurement have been criticised for inefficiencies, delays, and a lack of transparency, which can result in cost overruns, project delays, and degraded quality (Liu, Wang & Wilkinson, 2016).

The process of deciding on building project tenders is still fraught with difficulties, even with several laws and regulations designed to enhance public procurement procedures (Uttam & Roos, 2015; ABE, 2023). Among these difficulties are bureaucratic red tape, uneven implementation of evaluation standards, corruption susceptibility, and insufficient skill and ability among procurement personnel (Eriksson & Westerberg, 2011; Ferwerda, Deleanu & Unger, 2017). Thus, the public's confidence in the procurement process is weakened by the inefficiencies of tender adjudication, which also impedes project execution. For this reason, this study investigates the effectiveness of current tender adjudication processes utilised in South African public construction project procurement.

1.4 Research question (RQ)

How effective are the present tender adjudication techniques in South African public construction project procurement, and what adjustments may be done to make them more effective?

1.5 Sub questions (SQs)

SQ1: What is the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method?

SQ2: What is the order of importance assigned to the tender adjudication criteria by the procurement stakeholders?

SQ3: How can an alternative method improve the efficiency of the tender adjudication process?

1.6 Research aim

The aim of this study is to investigate the efficiency of the tender adjudication method using the preferential point system to select a suitable contractor.

1.7 Research objectives (Os)

O1: To evaluate the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method.

O2: To determine the order of importance assigned to the tender adjudication criteria by the procurement stakeholders.

O3: To determine whether an alternative method can improve the efficiency of the tender adjudication method.

1.9 Contribution of the study

This study contributes to the field of public procurement (Department of Public Works, the Department of Transport, the Department of Human Settlements, and the local government in the Western Cape) and construction project management in South Africa by providing a detailed evaluation of the efficacy of tender adjudication techniques. This study gives useful insights into increasing procurement openness, accountability, and effectiveness by thoroughly assessing existing procedures and highlighting their strengths and flaws. Furthermore, the study investigates the socioeconomic ramifications of various adjudication techniques, offering light on how they affect project success, stakeholder satisfaction, and general public trust. This study's findings could play a significant role in policymakers, procurement practitioners, and construction industry stakeholders, allowing for more evidence-based decision-making and encouraging the adoption of best practices.

1.10 Limitations

- This research does not investigate the efficiency of the current tender adjudication across all provinces nine (9) Provinces in South Africa.
- This study does not evaluate the recruitment of the tender adjudication team in order to ensure the effectiveness of adjudication process.
- This study does not investigate the impact of the Western Cape Tender supply chain policy in tender adjudication process.

1.11 Assumptions

The research explores the tender adjudication process in selecting a suitable contractor with the intention to improve the adjudication practice. The study makes the following assumptions:

- The study assumes that the tender adjudication techniques under consideration follow existing procurement legislation and guidelines established by relevant authorities in South Africa.
- The study assumes that stakeholders' ideas and viewpoints on the effectiveness of tender adjudication techniques appropriately reflect their experiences and beliefs.
- The study requires a certain level of transparency and collaboration from important stakeholders, such as government agencies, procurement bodies, contractors, and suppliers, in order to provide information and facilitate data gathering operations.
- It is assumed that parties involved in public procurement in the Western Cape Province are open to feedback and eager to consider proposals to improve the efficiency and effectiveness of tender adjudication processes.

1.12 Chapter outline

Chapter One: This chapter comprises the background of the study, problem statement, sub-problems, research questions, aim, research objectives, theoretical framework, conceptual framework, limitations of the research, assumptions, and significance of the research.

Chapter Two: This chapter reviews and addresses literature on the operations of the South African public procurement system. The focus is on the evaluation process to appoint suitable contractors.

Chapter Three: This chapter outlines the tools and methodology to be implemented for gathering and analysing the data. It details the research approach, the rationale for using the approach, the population identified, and the sampling method.

Chapter Four: The data gathered is presented in this chapter by the use tables, charts, or other visual aids that may be used to help explain the conclusions. It entails interpreting the data, spotting trends or patterns, and talking about any correlations between the different variables. Additionally, this chapter displays the conversations pertaining to the study questions. The results are finally compared to those of earlier research, any surprising discoveries are explained, and the ramifications of the findings for theory and practice are discussed.

Chapter Five: The final chapter acts as the research's conclusion, providing a synthesis of the findings, implications, and areas for further investigation.

1.3 Chapter Summary

This chapter establishes the context for the study by providing an overview of the subject: "Effectiveness of Tender Adjudication Methods in Public Procurement of Construction Projects in South Africa." The chapter describes the research aims, which include determining the efficacy and transparency of tender adjudication processes. Furthermore, Chapter 1 provides a quick outline of the dissertation's structure, highlighting the important chapters and their distinct focuses. It also discusses the research methodology used in the study, such as data collection methods, analytical procedures, and constraints.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews and addresses literature on the current observations of the operations of the South African public procurement system. The focus is on the tender evaluation process for selecting a suitable contractor. It also identifies and investigates the factors influencing the operations of the adjudication system, which assists with uncovering knowledge on how these factors can contribute to a more efficient selection of suitable contractors.

The public sector comprises three spheres: national, provincial, and local government. The national government has 45 departments, each with its own tender committee overseeing the procurement of goods and services. In each sector, the quality of goods, work and services are of importance, especially when awarding public tenders.

For public procurement, the government makes the process transparent, fair, and equal for everyone, but many believe the tender process is merely a way to notify the public of the selected tenderer, and with corruption at play, the tender has already been ‘awarded’ to a specific contracting company before it was advertised. The various processes involved in the full tender process are explored.

2.2 South African construction industry

The construction industry is an important sector for every country as it contributes to economic growth. Offei et al. (2019) observe that the construction industry is not a single industry but rather a complex cluster of industries, including banking, materials, equipment manufacturers, and contracting organisations, among others. In South Africa, the construction industry has a total of 8% of the nominal value, with a contribution ranging between 3% and 4% of the GDP from the first quarter to the second quarter of 2020. Moreover, the construction industry plays a pivotal role in employing South Africans as the employment of approximately 1.3 million people stayed relatively consistent from 2019 to 2020 (Osunsanmi et al., 2018). Tlomatsana (2016) states that the construction industry generates an annual revenue of approximately R267 billion.

However, the construction industry has been plagued by challenges prior to the COVID-19 pandemic. Some of these challenges include skills shortages in an already competitive market, declining levels of government infrastructure expenditure, high interest rates, and pressure for contractors to deliver successful projects with limited resources. The Master

Builders South Africa (MBSA) indicates that 60% of jobs in the construction industry are vulnerable, and up to 20% of these jobs will be lost in the short term.

Investment in the construction industry is mainly driven by government spending and is normally a good indicator of the industry's performance. The South African Government Infrastructure Development Plan and PICC are set up to coordinate the expenditure between the three spheres of government and are positive indicators for future economic growth in the industry (PWC, 2013). According to Faulkner et al. (2013), the South African construction sector remains one of the building blocks of economic recovery, and job creation can be achieved.

2.3. Supply Chain Management (SCM) in South Africa

According to Okoumba et al. (2020), in South Africa, supply chain management (SCM) is a multifaceted endeavour impacted by a range of infrastructure, social, and economic issues. Moreover, Selomo and Govender (2016) and Ambe and Badenhorst-Weiss (2012) pointed out that the SCM landscape of the nation is typified by a combination of opportunities and constraints, with operational reality being shaped by geographical variety, infrastructure deficiencies, and complex legislation. However, the deficits in infrastructure, notably in the transportation sector, provide major obstacles that raise expenses and cause delays, especially in isolated rural areas (Sibanda et al., 2020). Additionally, the geographical diversity of South Africa demands flexible SCM solutions to effectively negotiate a variety of procurement strategies, while combining operational performance with cost considerations (Du Toit and Vlok, 2014).

Government regulations in respect controlling transportation, import/export, and labour practices create the operational framework and must be followed to ensure legal compliance and risk mitigation (Okoumba et al., 2020). Thus, South Africa complicated labour environment, marked by strong unions and severe rules, emphasizes the significance of effective employment management in SCM methods to prevent interruptions such as strikes and labour disputes (Masete & Mafini, 2018).

Tuomala and Grant (2022) claims that SCM procedures are changing as a result of a greater focus on sustainability and social responsibility. As a result, businesses now understand how critical it is to reduce their environmental effect and support moral hiring practices (Masete & Mafini, 2018). In addition, Goedhals-Gerber (2016) reveals that it is both strategically necessary and morally accountable to incorporate sustainability concepts into SCM strategy in order to maintain long-term viability in the South African market. It is necessary to ensure that the resilience of SCM is protected in the face of South Africa's

unstable socio-political and economic environment via effective risk management techniques, such as insurance policies and backup plans.

2.4 International procurement system

The United Nations (UN) like Algeria, Argentina, Brazil, China, Ghana, and South Africa procurement system is a sophisticated, multidimensional framework that serves the organization's global goal of advancing sustainable development, peace, and security (Sakane, 2017; Lund-Thomsen & Costa, 2011). UN is regarded as one of the biggest buyers of products and services in the world, the UN procurement system is essential to maintaining accountability, equity, and openness in its purchasing practices (Hasselbalch, Costa & Blecken, 2015). Lund-Thomsen and Costa (2011) uncovered that the principles of integrity, value for money, respect for human rights, and environmental sustainability guide the UN procurement system, which is governed by an extensive set of rules, policies, and guidelines, including the UN Procurement Manual and the Vendor Registration and Evaluation System (UNGM).

According to Adjei-Bamfo et al. (2019) and Sayyed et al. (2023), inn developed countries like Australia, Canada, France, Japan and New Zealand, procurement systems are distinguished by sophisticated frameworks and processes designed to maximize efficiency, transparency, and value for money in the acquisition of goods, services, and works. The procurement systems frequently follow tight legal and regulatory criteria, assuring fair competition, accountability, and integrity throughout the procurement process (Ribeiro & Furtado, 2014). Furthermore, Choi et al. (2016) outline that a centralised procurement agencies or departments manage procurement activities, using sophisticated technology and e-procurement platforms to simplify procedures, decrease administrative burdens, and enable data-driven decision-making. Developed countries, procurement processes stress sustainability, social responsibility, and innovation, thereby reflecting broader public ideals and environmental concerns (Adebayo & Evans, 2015). As a result, procurement systems in developed countries help to safeguard the environment, promote economic development, and increase social inclusion through sustainable procurement rules, green procurement practices, and supplier diversity efforts (Williams-Elegbe, 2018).

Procurement processes in developing nations frequently encounter particular difficulties as a result of scarce resources, capability issues, and institutional flaws (Musanzikwa, 2013). However, these nations like South Africa, Nigerial, Senegal, and Mexico frequently have weak legal and regulatory systems, which leaves them open to weaknesses including corruption, inefficiency, and opaque procurement procedures (Muwema & Phiri, 2020). Ambaw and Telgen (2017) reveal that challenges faced by developing nation are further complicated by dispersed procurement procedures among many government agencies and

levels, which obstructs accountability, uniformity, and coordination. Thus, against this backdrop, procurement processes in developing nations frequently fail to provide excellent services, get value for the money, and successfully advance socioeconomic development (Afolabi et al., 2022; Mathonsi & Thwala, 2012; Owusu et al., 2019).

2.5 South African Procurement system

Procurement revolves around making purchasing decisions, which include factors such as delivery and handling, marginal benefit, and price inflation (Nsingo et al., 2007). Procurement plays a major role in Supply Chain Management (SCM). This study focuses mainly on procurement, specifically in terms of the tendering process in the government sector.

Public procurement is used as a tool to address the imbalances created by the past history of South Africa. The history of public procurement is inseparably linked to the development of national states through the ages, from the late Renaissance up to the modern state of the 21st century (Ambe & Badenhorst-Weiss, 2011:439). South Africa's public procurement system has also been prejudiced by its history. With the development of the modern state, especially the administrative state, public procurement has grown. It has become a socio-economic factor that all governments should consider. Public procurement utilises public money, with the intention of benefiting the general public, and the goods and services procured are normally delivered by private enterprises. Consequently, government, the public, and private suppliers all have a direct interest in public procurement. International trade has grown because of the growth of international efforts to create free trade among states (De la Harpe, 2009:2). Similarly, public procurement has grown, especially in the last decade. Worldwide, this growth has become a very important socio-economic factor described as a 'procurement revolution'.

ISO 10845:2010 defines procurement as the process through which contracts are created, managed, and fulfilled. This involves all the steps from the identification of the project to the request of offers and evaluating tender offers, awarding and administering contracts, and confirming compliance with requirements. According to Chaves et al. (2016), there are nine knowledge areas in the PMBOK and in the nine descriptions, one area defines procurement management. It states procurement management as the process of acquiring goods and services from outside the organisation. This consists of procurement planning, source selection, contract administration, and closeout. Chaves et al. (2016) further highlight that procurement and contract management are key deliverable objectives.

All the concepts mentioned above define procurement as a way in which goods and services are obtained to ensure project delivery occurs on time and is transparent.

2.5.1 Public procurement

Public procurement refers to purchasing by government and state-owned enterprises. It is the process of procuring goods, services, and infrastructure on the best possible terms (Fourie & Malan, 2020). The World Bank defines public procurement as a necessary strategic development instrument to promote good governance and to ensure the effective and efficient use of public resources for high levels of service delivery. The South African government uses procurement as a mechanism and a strategic tool for implementing policies aimed at boosting transformation in the socio-economic development in the country (Turley & Perera, 2014).

Public procurement has evolved over the years from being seen as merely purchasing goods by clerks to a complex government inclusive of multiple stakeholders and managers, and which is overseen by qualified procurement professionals (Davis & Brady, 2015). The transformation began in 1995 with two focus areas: promoting good governance and introducing a preferential system to address socio-economic objectives. Fourie and Malan (2020) explain that the legislative framework regulating government procurement in South Africa is based on five fundamental principles, with notable ones being the Public Finance Management Act (PFMA) and local government's Municipal Finance Management Act (MFMA).

Good governance is supported in Section 217 in the Constitution, which clearly states that the sourcing of goods, services, and construction works should be carried out with principles of fairness, equitable transiency, and competitiveness, and with the primary focus on cost-effectiveness (National Treasury, 2015). Procurement practises also ensure that government funds are used to benefit the public, as a large percentage of the funds are the taxpayer's money, which entails 12% of the GDP and 29% of government expenditure (Tintswalo et al., 2022). The National Department of Trade Industry implemented a programme called "local content", which requires that a certain percentage of the public tender price must have local content, thus 'giving back' to the public (Fourie & Malan, 2020).

Procurement plans are implemented using a procurement cycle that includes tendering, the awarding of the contracts, and contract management. The main purpose is service delivery and ensuring that it is of high quality and timely for the public programmes. However, public procurement in South Africa still faces constant allegations of fraud, corruption, and inefficiency, and has been strongly criticised by many (Fourie & Malan, 2020). In June 2013,

the competition commission announced a settlement with 15 construction firms for collusion in tendering – the estimated amount was R47 billion. This incident confirmed that public procurement is prone to irregularities and corruption (Greve, 2013).

In an attempt to curb the scourge of corruption, National Treasury has established an e-tender publication portal and central database, enabling the public to view all tender documents with information pertaining to the advertised tenders. The administrative part of this portal is managed by the Office of the Chief Procurement Officer. This was all done to reduce legislative fragmentation and to improve the transparency and accountability in the awarding of tenders (Allison, 2018).

2.5.2 Targeted procurement in South Africa

CIDB (2012) refers to *targeted procurement* as a government procurement intercession strategy designed and used in the construction industry to promote the participation of targeted enterprises and targeted labour in government infrastructure contracts. The targeted procurement policy was developed in South Africa to break away from the apartheid regime of awarding tenders to well-developed contractors. It aims to provide business opportunities and employment to disadvantaged communities and individuals (Adediran & Windapo, 2017).

In 1995, a Procurement Development Team developed the targeted procurement, and then in 1997 it was driven by the National Department of Public works after approval by Cabinet. The current green paper on the public sector was initially referred to as the “10-point plan” developed by the task team. The team provided a series of interim interventions that were applied within the State Tender Board Act 68 of 1968 as the process to reform procurement (Adediran & Windapo, 2017).

In the construction industry, for the procurement of public infrastructure, targeted procurement is extensively used. This can be attributed to the substantial influence the public sector has on the performance of the construction industry, as a significant proportion of public spending is on capital assets. Targeted procurement uses a standard resource specification which is known as TP 1-TP6. It is incorporated into a conventional procurement system (Bolton, 2006). Table 2.1 shows how targeted procurement standards are used to support socio-economic objectives Watermeyer, 2012).

Table 2.1: Resource specifications required to enact certain targeting strategies

Socio-economic objectives	**Resource specification required to enact certain targeting strategies**

	Code	Strategy
Development of sectors of an industry, e.g., small businesses, women owned businesses and local industry development.	TP 1	Targeting of affirmable business enterprises
	TP 2	Structured joint ventures (affirmable partners)
Development of sub-contractors to prime (main) contractors. Development of management capacity of small businesses.	TP 3	Structured joint ventures (targeted partners)
• Local economic development • Job creation • Poverty alleviation • Community-based developments	TP 4	Targeting of local resources
• Job creation • Poverty alleviation	TP 5	Engagement of targeted labour

However, the specification used in targeted procurement are complex, and as a result, some contract documents do not include these specifications but use them only for reference.

2.5.3 Preferential Procurement Policy Framework Act (PPPFA)

The Preferential Procurement Policy Framework Act (PPPFA) is widely used in the construction industry as a tender adjudication method for selecting a suitable contractor. The PPPFA offers classifications of preference in the distribution of contracts and the advancement of people who are disadvantaged by imbalances. The PPPFA encourages historically disadvantaged individuals (HDIs) through the allocation of preference points in tendering for goods and services (National Treasury, 2004:23; South African Government, 2000). When evaluating tenders, a preference point system is used. The Department of Public Works uses the same methodology for evaluating tenders.

There are two types of preference point systems in the PPPFA depending on the amount of product procured. For goods and services that are R1 million and less the 80/20 system is applied, whereas for goods and services above R1 million the 90/10 system is applied, with 80 or 90 points for price and 10 or 20 for BEE status (National Treasury, 2017:9).

The Preferential Procurement Policy Framework Act 5 of 2000 (South African Government, 2000) was implemented with the following objectives in mind:

- Fairness and equitability
- Integrity
- Accountability
- Competitiveness

- Effectiveness
- Transparency

The selection of tenders is a difficult process that influences project performance in terms of time, cost, and quality. To reduce or eliminate problems and ensure a smooth delivery during the construction of a project, a suitable tender selection must be implemented (De la Harpe, 2009). Despite the extensive acknowledgement of the PPPFA as a policy tool to accomplish socio-economic objectives, literature indicates a lack of research in terms of improving the effectiveness of the preferential procurement policy in selecting a suitable contractor for a construction project.

This research focuses on the preferential point system that was established to give preference to HDIs in the construction industry. Furthermore, the research concentrates on associated procedures and operations used to select a suitable contractor. It also recognises obstacles that constrain the practice of selecting a suitable contractor. The current tender adjudication method is one-dimensional, as it does not fully capture the magnitude of adjudicated criteria and ignores ranking by level of importance.

2.5.4 Public Finance Management Act (PFMA)

The Public Finance Management Act (PFMA) is a cornerstone of financial governance in South Africa, incorporating values of openness, accountability, and responsible fiscal management in the public sector (Makhanya, 2023). The PFMA, enacted in 1999, establishes tight regulations for the planning, distribution, and utilization of public monies, ensuring that they are oriented toward societal improvement while remaining fiscally responsible (Oageng, 2021). Furthermore, Madue (2007) and John (2016) argues that PFMA legislation requires government bodies to follow specific procedures for budgeting, income management, and expenditure control, establishing a culture of responsible stewardship of public resources.

According to Makhanya (2023), the PFMA places a strong focus on contract management and procurement integrity with the goal of fostering efficiency, fairness, and competitiveness in government agencies' procurement procedures. The Act creates precise requirements to support accountability and openness in procurement activities, demanding strict adherence to legal and fair standards in contract awarding and public funds utilisation (Moolman, 2021). Hence, PFMA protects the integrity of public procurement by creating a competitive market and limiting opportunities for corruption and malpractice (Shuping, 2021). PFMA in turn, increases public faith in government transactions and expenditures (Shuping, 2021).

2.6 Tendering

The process of tendering involves inviting tenderers to supply of goods and services and awarding the contract to the best offer in accordance with set criteria without negotiation (Woods, 2008:235). Similarly, Woods (2008) contends that tendering is a critical anti-corruption method, while Nsingo et al. (2007:124) state that a tender is an offer to deliver goods or service in competition with other prospective suppliers.

According to Kovacs (2004), there are two normal tendering methods: open tendering procedures and restricted tendering. Kovacs (2004) states that open tendering procedures occur when, ideally, all potential bidders from around the world are permitted to submit a bid. There are no boundaries and restrictions for participation, and the procurement is advertised nationwide. Restricted tendering, on the other hand, means procurement where a group of qualified bidders is considerably reduced to only a few capable bidders who are invited to participate competitively.

According to Woods (2008:234), tendering has its own rules and emphasis. Procurement transactions conducted through formal tendering systems are usually done because of their relatively high value. The general rule concerns a predetermined limit above which the transaction should be subject to more stringent tendering rules. As with many other aspects of public sector management reform in South Africa, tendering activities and their control have recently been devolved from a centralised arrangement to the individual organisations themselves. All the associated best practice tendering requirements remain in force. Woods (2008:234) states that tendering, and capital expenditure for that matter, does not only apply to fixed asset type items but also to what are known as capital projects. These projects could be the building of a new hospital, a road, or any form of other large infrastructural developments a government decides upon. Such capital spending is more complex, and the investment appraisal methods used become even more critical. This is where the result of the tendering process is to award a contract for service to the winning tender or bid. Public tenders, limited public tenders, private tenders, negotiated contracts, serial contracts, divided contracts, and concessions are ways in which tenderers are called and contracts are concluded (Gildenhuys, 2002:604).

Results indicate that one in six tenders turns out to be a winning tender. Thus, it is important to decide whether to tender or not (Wisner et al., 2006). A study by Bohari et al. (2021) lists 15 factors guiding the decision to tender (or not). The results from Bohari et al.'s study align with Bajaj et al. (1997), who ranked the most important factors per project type. The type of project determines the comprehensiveness of the business plan, number of competitors, and time for tender. The second most important factor (whether to tender or not) depends

on the availability of personnel. Additionally, a contractor can have several intentions for tendering for a project. Bohari et al. (2021) identify the most usual intention as winning the contract, but also to enhance reputation. In Africa, tendering is extremely critical and important for the operation of national government as it relies heavily on the supply of goods and services, information, and other inputs, and these are obtained through the tendering system. According to Waters (2002:562), tendering is essential, and unless it is done well, operations are interrupted, product quality is compromised, deliveries are late, the wrong quantities are delivered, costs rise, and customer services decline.

2.7 Construction project tendering

Tendering plays an important and critical role in the operations of national government. Schöttle et al. (2015) define project tendering as the process where the state requests contractors/suppliers to submit proposals, tenders, or information. Tendering is one of the common procurement processes used to obtain construction services (Allison, 2018).

Tendering is central to South Africa's national government and is therefore used by provincial governments. Contractors receive invitations to tender for the project in the form of an advert in local newspapers, trade magazines, and government bulletins, among others (Ngobeni, 2011). Once the bidder has attended the briefing and collected the prices for the materials listed in the tender document, they proceed to contact suppliers for the 'going value' of the material that will be needed during the construction period – this is one of the procurement steps in the construction tendering process (Brook, 2016). After the bidder has submitted their offer, the adjudication team verifies that all required documents are there, and the bid is evaluated.

South Africa continues to be confronted with the highest level of corruption rates in the world, of which tender fraud plays a major part. On 15 April 2015, the National Treasury launched an e-tender portal and a central supplier database. The aim of the portal is to post tender notices, official tender documents, changes made on the tender document, relevant descriptions for functionality, and award notices. The portal can be accessed by the general public, thus ensuring a fair and transparent tender process for all.

2.7.1 Historic tendering

With the event of the newly elected democratic government in 1994, the implementation of procurement and tender reforms was introduced to address the injustices of the past government and flaws in the procurement system (Allison, 2018). The aim was to provide opportunities for small and emerging contractors to perform work in the construction industry and in other departments. The upbringing of small, previously disadvantaged individuals to

own their own businesses and to do work for the public sector was identified as important (Allison, 2018).

The government then continued the reform by changing the way in which the management of financial resources of the state government were distributed by passing new legislation and adopting progressive policies related to government procurement. This all began in 1996 when the Constitution of the Republic of South Africa (No. 108 of 1996) was passed. Then in 1999, the Public Finance Management Act (PFMA) (National Treasury, 1999) was introduced. The government explored ways to employ previously disadvantaged individuals. In 2000, the South African government passed the Preferential Procurement Policy Framework Policy Act 5 of 2000 (South African Government, 2000), which utilises a point-scoring system to ensure their preference (National Treasury, 2015).

After revising the empowerment programme due to the realisation that only a few black people were benefiting from it, the government introduced the Broad-Based Black Economic Empowerment Act 53 of 2003 (South African Government, 2003). It was clear that the South African government acted accordingly to bring about changes it aimed to achieve in public procurement.

2.8 Types of tendering available in South Africa

This research has shown that tendering is a means for a contractor to win the right to deliver on construction projects. It is important to note that tendering does not only happen between the client (in this case, the government) and the contractor. Tendering can take place between the contractor and a sub-contractor, such as those specialising in air conditioning, or between the contractor and the suppliers for work carried out during the project. Tendering is the best way to describe the action performed before awarding the project to be implemented. Flynn et al. (2015), founder of Open Tenders portal, states that “tenders allow small businesses to take the first step to sustainability”.

2.8.1 Open tender

Open tendering begins when a contract is advertised through means such as newspapers and online platforms. Tenderers are then given the opportunity to submit their tenders in response to the advertisement. According to Adedokun et al. (2013), open tendering is a method where contractors and potential suppliers are invited by an organisation (i.e., a client), through publishing in newspapers and other technical press, to apply for supplying goods or providing services required by the organisation. There are no limitations and restrictions on participation, and the procurement process is advertised nationwide.

On other hand, restricted tendering refers to a procurement method in which the group of eligible bidders is significantly reduced to a few qualified bidders who are invited to participate in the competition. Open tendering is open to the public, which encourages tenders from various contractors to be submitted; thus, it creates an opportunity for all. There is no limit to the number of tenders that can be submitted (Taylor, 2019). Tenders are submitted based on the specifications detailed in the tender document. The tender document must be submitted on a stipulated date and time. Late tenders are not considered; instead, it is returned to the sender.

For the opening of tenders, a date, time, and venue are provided. The opening of the tenders is done in a public area where every tenderer has the opportunity to witness officials as they open the tenders. This is done to ensure fairness and transparency so that no tenderer makes changes or is allowed additional time to submit their tender (Drori et al., 2013). The tenderer that best submits a responsive tender with the best value for money will be awarded the contract. The organ of state generally prohibits any negotiations, but under certain circumstances it may be necessary. However, Drori et al. (2013) state that demarcating the boundaries of negotiation in procurement methods is difficult.

A study done by Adedokun et al. (2013) in Nigeria reveals that open tendering is often adopted by government, parastatals and other organisations that are financed by public resources. Organisations that adopt an open tendering system have a high chance of enhancing accountability and limiting instances of favouritism. Open tendering creates room for potential suppliers and contractors to compete, thereby making it possible for the organisation to select less-expensive and economical suppliers (Adedokun et al., 2013). Government projects are mostly advertised using open tender approach and this study seek to propose effective tender adjudication process that can be adopted in public projects.

2.8.1.1 Tender advert

According to Nyamari et al. (2023), a tender advertisement in construction is a formal invitation or notification issued by a client or contracting body requesting bids from qualified contractors or suppliers for a specific construction project. The advert usually includes the scope of work, project details, eligibility criteria, submission deadlines, and evaluation criteria (Munzhedzi, 2016). Additionally, Chilunjika et al. (2022) reveals that the tender advertisements play an important role in the procurement process since they give interested parties with complete information about the project and the bid submission requirements.

2.8.1.2 Bills of Quantities (BOQ)

In the construction industry, Bills of Quantities (BoQ) are essential papers that are carefully designed to give an in-depth analysis of the materials, labour, and resources needed to complete a project (Abdullahi et al., 2021). Kodikara et al. (1993) and Martínez-Rojas, Marín and Miranda (2016) argues that BoQ work as a contractor's road map, providing comprehensive instructions on the sizes and characteristics of all components required, ranging from steel beams and bricks to electrical wiring and plumbing fixtures. BoQ enables accurate cost estimation easier by quantifying project components and defining quality standards (Abdullahi et al., 2021). This helps clients make well-informed budgetary decisions and contractors submit competitive bids (Jalam & Dahiru, 2018). Furthermore, the BoQ is essential to the tendering process since it makes sure that all potential contractors are aware of the needs and scope of the project, which promotes fair competition (2017).

2.8.2 Negotiated tender

The negotiated tendering method is applied when a client reaches out to a specific contractor rather than calling for tenders. There are several reasons for this approach, including past working experience with the contractor, special expertise needed for the work to be completed, or when the contract is being extended. Clients say working with a contractor they have already worked with gives them confidence and it also helps to reduce cost and the project is completed on time as the project will run smoothly (Seng, 2019).

Upon the selection of a contractor, they are issued with a detailed summary of the scope of work, relevant drawings, designs, and any information they may require for the completion of the project (UK Essays, 2018). However, this method of tendering removes competition, which can lead to conflict and power struggles during work. In public projects, negotiated tendering is not permitted, as all contracts must be advertised (Seng, 2019).

2.9 Selected tendering

For this method of tendering, a short list of contractors is drawn up, and only the contractors on this list are considered for project delivery. The names of the contractors on the list are drawn up by the employer and consultants, based on the contractors they have in their records. The contractors are then invited to tender. The process is used for specialist work or where only a few contractors fit the criteria specified (Adedokun et al., 2013). Seng (2019) states that the recommended number of tenderers is limited between five and eight, depending on the size and complexity of the project. The selected process is seen as a poster process as there is no need for pre-qualification questionnaires. However, contractors tend to submit higher prices since they understand that there is less competition and a higher calibre of tenderers.

2.9.1 Public-private partnerships and build, operate and transfer

A Public-Private Partnership (PPP) is a complex contract between the government and a business that can accomplish what the other side is lacking to prevent projects left uncompleted. These can include expanding infrastructures when funds are limited (Marques de Sá, 2017). The National Treasury (2022) defines PPP as “a contract between a public-sector institution and a private party, where the private party performs a function that is usually provided by the public sector and/or uses state property by agreement. Most of the project risk (technical, financial, and operational) is transferred to the private party. The public sector pays for a full set of services, including new infrastructure, maintenance, and facilities management, through monthly or annual payments”. Here the public receives a better and more cost-effective service, and the private sector receives a new business opportunity. In 1998, PPP was introduced in South Africa and thus far, the total value of PPP projects amounts to R89.3 billion (Maluleke, 2021). The World Bank emphasises that infrastructure is difficult for the public sector to get right. Therefore, PPP helps by providing more efficient procurement, focusing on maintenance, and providing a new source of investment.

Many say this model is effective for high-cost, high-visibility projects that involve social and technical complexities. The PPP is a long-term contract that can last between 10 and 30 years, during which each party involved has rights and obligations. With a sound regulatory framework in place to ensure transparency and management risks, South Africa has considerable experience in establishing successful PPPs (National Treasury, 2022). There are various types of PPP projects, and this is based on the contractual agreement. These are mainly:

- Design, finance operate (DFO)
- Design, finance, build, operate and transfer (DFBOT)
- Build, operate and transfer (BOT)
- Equity partnership
- Facilities management projects

Build, operate and transfer (BOT) is used to finance large greenfield infrastructure projects that would usually be financed, built, and operated solely by the government. For a BOT project, the right to develop and operate a facility for a certain period is granted to the private sector by the public sector. The private sector company operates the project for 20 to 30 years. Hayes (2020) posits that the end goal is for the company to recover its investment and then transfer control of the project to the government. In other words, BOT contractors deliver special projects.

2.9.3 Tender adjudication

Tender adjudication is a management activity with competitive tendering that involves the exercise of subtle and subjective commercial judgement that will arrive at the tender figure. (Arrowsmith, 1995). After tenders have been submitted, the process of tender adjudication begins (some refer to it as tender evaluation). The offers are reviewed at the tender opening and a decision is made based on a detailed evaluation to determine if the documentation received follows the specifications document (Roy, 2017a, 2017b).

Tender adjudication in the construction industry refers to the evaluation of a tender by the client's representative using a series of criteria, with each component being assessed and scored, and combined at the final stage of the procedure (Morledge et al., 2006). It is essential to ensure that a thorough evaluation of both the technical and financial proposal is conducted when appointing a contractor (Noorizadeh et al., 2019). However, contractors may aim to keep their price as low as possible, and in the process, they perceive the time and price criteria as less important (Tunstall, 2006). This may lead to highly qualified contractors not submitting tenders, thinking that they may have a lower chance of winning the contract, thereby enabling less qualified contractors to bid and being awarded the project (Ward, 2008).

Evaluation of the financial resources and technical capability of a contractor is expensive and takes time. If the contractor evaluation process is not properly done, the client will end up selecting a low-price bidder which may result in selecting a contractor that is technically less able (CIDB, 2004). The intention is to select a competent and suitable contractor at a reasonable cost. The tender is evaluated on the price offered by the contractor, previous experience in similar work, and current work. The adjudication team also checks for imbalances in the priced bill. These are some of the key criteria, but they are not limited (Van Rooyen, 2020).

2.9.4 Tender adjudication process

The PPPFA (South African Government, 2000) stipulates that an organ of state must indicate in its tender documents the criteria to be used during adjudication. These criteria should meet the public procurement objectives and the specific goals. Appointing a project to a contractor is an imperative choice faced by a client. Hence, there is a need for criteria and standards that afford the best project delivery (ul Musawir et al., 2020). The public primary procurement policy objectives cover aspects related to price and functionality, whilst specific goals are covered under the preferential point system (Watermeyer & Jacquet, 2004).

Conventionally, tender adjudication comprises criteria such as:

- Price, which includes whole life and capital cost
- Functionality, which includes previous experience, contractor financial viability, technical competence, current workload, contractor performance, operational health and safety, and records, among others
- Preferential point system, focusing on historically disadvantaged individuals

As stated on the tender document, the PPPFA principles apply, whereby tenderers' submission is evaluated according to the sum of awarded points in respect of the tendered value and the status of the enterprise. The following data illustrate the criteria that can be used in the awarding of a contract:

Preference points:

- Four (4) points for HDI Status/BEE/B-BBEE
- Three (3) points for gender equity (women's equity)
- Two (2) points for youth
- One (1) point for disability

Target goals:

- Sixty (60) points for price
- Thirty (30) points for functionality (quality from reference, similar previous experience, availability of own professional staff, availability of working capital, etc.)

2.9.4.1 Effectiveness of the tender adjudication in selecting a technically competent contractor

Technicality in tender documents is stated as ***functionality***. Functionality is the measurement according to predetermined norms as set out in the tender documents of a service or commodity that is designed to be practical and useful, working or operating, taking into account the quality, reliability, viability and durability of a service, and the technical capacity and ability of a tenderer (Anthony, 2013).

The technical adjudication helps the government and any other persons adjudicating to have another layer besides price adjudication. Pricing does not necessarily show the adjudicator that the tenderer has knowledge of what they will have to do. Technical aspects of the tender can vary from stating suppliers to be used, writing method statements and methodologies, and specifications of the products to be used. The technical adjudication of a tender also provides the government with reasons behind any tender awarded.

2.9.4.2 **Preferential Procurement Policy Framework Act 5 of 2000 (PPPFA)**

On 3 February 2000, the Preferential Procurement Policy Framework Act 5 of 2000 (PPPFA) was published in the South African Government Gazette No. 97. The Act gave effect to the constitutional provisions concerning social-economic objectives as contemplated into socio-economic objectives in section 217 of the Constitution (Letchmiah, 2012). This Act was to bring about the radical economic transformation within procurement by organs of the state.

Section 2 (1) of the PPPFA allocates a preference point system that must be followed by all organs of state when considering tenders. Tenders with a Rand value up to R500,000 are to employ the 80/20 preference point system, and tenders with a Rand value over R500,000 are to employ the 90/10 preference point system. The 80 or 90 points are awarded for price, while the 20 or 10 points are awarded to historically disadvantaged individuals (HDIs), or for achieving certain specified goals, which could include implementing programmes forming part of the Reconstruction and Development Programme (RDP); the promotion of South African owned enterprises; the promotion of small, micro, and medium-sized enterprises (SMMEs); job creation; and certain other goals. Goals must be measurable, quantifiable, and clearly specified in the invitation to tender.

The main aim of the Act is to advance the development of small, medium, and micro enterprises and HDIs, as well as to promote women and physically handicapped people and local enterprises in a particular region, specific local authority, or in rural areas. In the event of a contractor using false information to obtain preference points, the PPPFA and its regulations provide for penalties. This could lead to the termination of the award to the contractor and all recovery costs will be billed to the contractor (Korman, 2014).

2.9.4.4 **Preferential point system**

In terms of the preferential point system, many would agree that a good B-BBEE status level is of importance, according to Fourie and Malan (2020). To claim preference points that will be used in the tender document, a standard bidding document is used. The more points a tenderer scores with the preferential point system, the higher the B-BBEE status level. In 2017, changes in the Preferential Procurement Regulations were made to increase the threshold value of the 80/20 and 90/10 preferential point system.

As of 1 April 2017, the National Treasury (2017) released the following preferential point system applicable for all organ of the state bids:

- A minimum value of R30,000 up to a maximum value of R50,000,000 will have an 80/20 preference point
- A value of above R50,000,000 will have a 90/10 preference point

When submitting the Standard Bidding Document (SBD), tenderers are required to submit a B-BBEE certificate that has been verified and accredited by the South African Accreditation System (SANAS), or an affidavit stating the B-BBEE status, to earn points. Korman (2014) further states that tenderers who are awarded contracts based on preferential points will not be permitted to sub-contract more than 25% of the value of the project to a sub-contractor that does not have an equal or higher B-BBEE status level.

2.9.4.5 **Tender price**

In South Africa, several criteria are used when selecting a contractor to execute a contract. The most used one is the tender price, whether it is an acceptable offer or a preliminary offer (Megginson & Weiss, 2022). The tender price is an important criterion in the selection and appointment of a contractor (Khan & Hosany, 2016). The tender price is regarded as the market price for the contract. The final sum represents the total price of the construction to the completion of contract, and this includes variations, escalations, and claims. A tender price is based on the project information supplied by the client, which, in this case, is the government agent. The Invitation to Tender (ITT) document must contain all the information that will be used by the contractor to estimate the tender price (Olanrewaju et al., 2022). In a case where the information provided in the ITT document does not adequately describe the project, it could lead to unrealistic tender submissions.

The pricing of the tender is done using Standard Bidding Document 3 as follows:

- SBD 3.1 for firm prices
- SBD 3.2 for non-firm prices
- SBD 3.3 for professional service providers

There is no definite method of deriving at the tender price, but there are general pointers to consider when a price is calculated (Van Rooyen, 2020). Selection based on the lowest tender stimulates competition and satisfies public accountability. However, Huang (2011) argues that low price bids pose certain problems, such as the selection of unqualified contractors causing extensive delays, cost overruns, and quality problems on construction projects. Researchers have increasingly shown that the practice of awarding tenders on a basis of lowest price often leads ultimately to quality problems.

2.9.4.6 **Contractor resources**

According to Ghoddousi et al. (2013), a construction project as an entity is an arrangement of material according to a preconceived plan. Ghoddousi et al. further elaborates that to effect this specific arrangement, additional material, manpower and equipment are generally required along with some element of time and space.

Resources include personnel, plant and tools required for the construction project (Ashuri & Tavakolan, 2015). The type of personnel chosen for a certain project is based on qualification and experience. Depending on the project's complexity, contractors must show whether they have the expertise internally or whether they will hire expertise upon winning the contract (Khalili & Chua, 2014). Both options are viable and prove the contractor's understanding of the project/tender. The same has to be stated for plant tools. The contractor is required to prove that they have the equipment or plan to hire it to complete the project for which they are tendering. However, most small emerging contractors do not have resources like plant and equipment, which places them at a disadvantage when compared to a contracting company.

2.9.5 *Broad-based Black Economic Empowerment Act 53 of 2003*

This act was introduced to address the lack of a comprehensive BBE strategy. Its purpose was to bring together various elements of the government's transformation programmes in a more coherent and focused way (South African Government, 2003). The main objectives of the B-BBEE Act is to expand the framework provided in the PPPFA by providing a legislative framework for the promotion of black empowerment to empower the Minister to issue codes of good conduct and formally establish a Black Empowerment Advisory Council (Matemotsa, 2017). The Act also provides for codes of good practice for black economic empowerment that may include adjudication criteria for preferential purposes in procurement. However, Wehmhoerner (2015) found that the B-BBEE legislation causes economic strain and is not overcoming the social injustices of the past. Uppal (2014) further illustrates that the B-BBEE legislation is restricting economic growth due to the corruption involved.

2.9.5.1 SARS Tax certificate

Contractors' South African Revenue Service (SARS) tax certificates are essential documentation in the construction sector, acting as proof of compliance with tax laws (Njana, 2022). Also, Akinboade, Mokwena and Grobler (2015) pointed out that contractors' tax certificate is a conformity to tax rules, including timely payment of income tax and Value Added Tax (VAT). A contractor with certifications in hand, can demonstrate their dependability and integrity to clients and regulatory organizations, laying the groundwork for conducting business in the construction industry (Mhlanga & Masehela, 2023).

Furthermore, SARS tax certificates are highly valued in the competitive construction project tendering environment (Mhlanga & Masehela, 2023). A lot of clients, especially big businesses and governmental organisations, want tax clearance certificates to be submitted as part of the tendering process and this documentation forms the bases of the tender adjudication process (Fritz & Van Zyl, 2019). Majority of construction projects are awarded

to contractors that comply with tax laws are given consideration for project awards by requesting these certifications, which promotes accountability and openness in procurement procedures (Scheepers, 2019). As a result, having a current tax clearance certificate not only attests to a contractor's sound financial standing but also provides access to profitable business prospects in the construction sector (Mvangeli, 2023).

2.10 Competitiveness of the contractor

The construction building industry is a highly competitive and risky business. The competitiveness is largely attributed to cost traditionally being the prime factor in the tender selection process (Gasa, 2012). Competitiveness is an important aspect of tendering, as contractors can improve competitiveness through experience and knowledge acquired during past projects (Flanagan et al., 2005). Kim and Mauborgne (2014) describe competitiveness as owning better capabilities than the other competitors to achieve best results for a company.

When awarding a contract, certain critical success factors affect a contractor's bidding competitiveness and should be considered for a contractor to improve his chances of winning the tender. Gasa (2012) emphasises that the contractor selection process varies across different types of construction projects. In the Construction Industry Development Board (CIDB) register there are about 1200 registered large contractors across all types of work, and the South African government still awards public sector construction projects to large companies based on the premises that they are technically and financially able to execute the projects. However, Oyewobi et al. (2014) state that many clients report poor performance of contractors on public projects.

2.10.1 Contractors' technical competence

CIDB competence refers to the grades developed to assess the competence of a contractor. The grade ranges from 2 to 9. Contractors are assessed using the CIDB Competence Standard for contractors, which establishes the minimum requirements for a contractor to run a construction company and for supervising the building. The standard provides a method of assessment and recognition of the competencies of a contracting enterprise within a CIDB class of construction works and construction.

One of the crucial factors in contractor selection is to prove that it has the technical capacity to perform all activities required for a specific project (Oyeyipo et al., 2016). Puri and Tiwari (2014) found that the most popular criteria considered by procurers during the selection and pre-qualification procedures are those relating to financial stability, management, technical

ability, contractor’s experience, contractor’s performance, resources, quality management, and health and safety concerns.

The contractor must prove that they are technically capable of achieving the activities of the specific project for which it seeks pre-qualification (Nieto-Morote & Ruz-Vila, 2012). Alzahrani and Emsley (2013) applied multiple regression analysis to invest 43 influencing technical attributes in contractor selection and their influence on project success objectives. Their study found that technical capability, past success, time in business, work methods, and working capital crucially impact on contractor performance across time, cost, and quality success objectives.

2.10.2 Functionality of contractor

Tavakolan, Chokan and Dadashi Haji (2024) describes contractor functionality as a crucial aspect of the tender adjudication process, providing experience, insight, and professionalism to guarantee the best qualified bidder is selected for a construction project. In addition, Rahman and Alzubi (2015) reveals that contractors' functionality review allows the adjudication team to pick competitive bids that not only fulfil project specifications but also exhibit technical expertise, financial sustainability, and the ability to complete the project within the specified dates. In essence, contractors' functionality in the tender adjudication process goes beyond bid preparation to include active involvement, collaboration, and a dedication to quality, which improves the efficiency and effectiveness of construction procurement processes (Tian et al., 2022; Song, Mohamed & AbouRizk, 2009).

2.10.3 Disability in tender adjudication

In South Africa, disability-related tender adjudication is essential to advancing fairness and inclusivity in public procurement procedures (Wanyoike, 2021; Thompson, 2015). Moreover, Thompson (2015) and Albertyn (2021) and Pityana (2003) highlighted that public procurements must take into account the needs of people with disabilities, as required by the nation's legislative framework, which includes the Promotion of Equality and Prevention of Unfair Discrimination Act (PEPUDA) and the South African Constitution. In addition, South Africa is a signatory to the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), which promotes inclusive practices among member states and accessibility in public procurement (Pityana, 2003). Hence, Verhagen et al. (2015) claims that procurement bodies can guarantee that contracts promote inclusion and equality and are in compliance with international and national commitments by incorporating accessibility standards and non-discrimination principles into their tender documents. Furthermore, training procurement authorities on disability inclusion might improve their capacity to assess accessibility requirements accurately (Wolfe et al., 2014).

2.10.4 Gender equality in tender adjudication

According to Kiwekete and Doorgapersad (2017), gender equality in tender adjudication of South Africa is critical to developing a more inclusive and equitable public procurement process. The country's legislative framework, which includes the South African Constitution and the Broad-Based Black Economic Empowerment (B-BBEE) Act, requires state procurement to promote gender equality and encourage female-owned enterprises (Mogodi et al., 2013). Additionally, South Africa's commitment to international frameworks such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) emphasizes the importance of including gender issues into procurement policies (Mogodi et al., 2013). Gender equality standards and affirmative action clauses into tender agreements, procurement agencies can ensure that contracts promote women's economic involvement and empowerment (Mukhopadhyay, 2016).

2.10.5 Youth in tender adjudication

In order to support economic empowerment and create possibilities for young entrepreneurs, it is imperative that tender adjudication in South Africa take youth considerations into account (Nderitu & Karanja, 2018). Miccio-Fonseca (2023) promotes the importance of assisting youth in economic activities is emphasized in the South African Constitution and in a number of laws, including the National Youth Policy and the Broad-Based Black Economic Empowerment (B-BBEE) Act. Thus, public procurements must highlight the inclusion of youth-owned firms and encourage youth employment possibilities, according to these frameworks (Matemotsa, 2017). Additionally, procurement agencies can guarantee that contracts help the younger population of South Africa by including conditions in their documents that encourage youth development and engagement (Matemotsa, 2017).

2.10.6 Contractors' past performance and experience

The importance of past performance is linked to future business. Tenders are ranked based on past performance in past tenders to predict their ranking in future bids. When tendering for construction projects, the difference in tender pricing among contractors is attributed to four main factors: experience, insufficient information, high labour, and material costs (Mui et al., 2016).

2.10.7 Contractors' financial resources

In 2010, the South African construction industry had a total of 30% in investments. This was due to the construction industry having delivered an output access of R20 billion per annum, where 58% came from the public sector and tenders, and 13% from public corporations (Korman, 2014). It has been identified that construction projects do not require a large capital expenditure but rather a larger working capital to finance the projects (CIDB, 2017). Over

the years, the cidb has identified the need for financial support to emerging contractors and working together with some financiers to close this gap.

The first place for financial assistance for businesses is the bank. However, in South Africa, there are no banks that play a major role in construction financing. This can be attributed to the banks generally being risk assessors and therefore not willing to fund a business that does not have a track record, financial statements, and collateral to offer and cannot contribute to the funding requirements for a company. This has led to the introduction of the Khula model, designed to provide the guarantee required by the banks so that the contractor can be funded with a backup. If the contractor fails to pay back the bank, it will be paid for by Khula (CIDB, 2017).

However, some banks fund the contractor with building material by having joint ventures with suppliers like Buco and Cash Build, among others. This gives the contractor a guarantee for the material for the project at hand. In the upliftment of black empowerment, Nedbank offers tailormade solutions to black-owned businesses, with 25% and more of black people in the business generating an annual turnover between R5 million and R35 million (cidb, 2017).

2.11 Elementary checking

According to Brunette, Klaaren and Nqaba 2019), tender adjudication, particularly elementary checking, entails the initial screening of bids to ensure that they meet the basic standards and criteria specified in the tender documents. Amoah (2017) added that this method is critical for ensuring fairness and transparency in the procurement process. However, Bielefeld (2018) and McGuinness (2008) stressed that the primary steps and factors for elementary checking in tender adjudication includes:

- Compliance with Submission Requirements - Confirm that all required paperwork, including bid forms, declarations, and certifications, was included in the bid and that it was submitted right before the deadline.
- Eligibility Criteria - Ensure that the bidder meets all legal requirements, such as being a registered corporation or an individual entitled to tender.
- Technical requirements - Confirm that the bid satisfies the minimal requirements listed in the tender document and make that the bidder has attached documentation of their appropriate training and experience.
- Regulatory and Policy conformity - Verify conformity with applicable policies, such as Broad-Based Black Economic Empowerment (B-BBEE) in South Africa.
- Bid Security - Ensure that the bid security is valid for the specified period.

Thus, Kokor (2015) and Ambe and Badenhorst-Weiss (2021) concludes that maintaining the integrity and effectiveness of the procurement process is ensured by elementary checking in tender adjudication, which makes sure that only bids that satisfy the fundamental requirements move on to comprehensive review.

2.12 Perception of procurement team regarding the effectiveness of the current tender adjudication method

Public procurement was the government's attempt to achieve desired strategic policies (McCrudden, 2004). As we know, for policy-making requirements to have effect, it needs information provided, whether the government is doing things right, and whether they achieve the intended results (Boruchowitch & Fritz, 2022). A strong monitoring and adjudication system provides the means to compile and integrate this valuable information and therefore provides a basis for sound governance and accountability. The procurement actors in government have spent millions in a way that contravened laws and regulations. Both the national and provincial government have notched irregular, unauthorised, fruitless, and wasteful expenditures that contravene laws and regularities.

According to Hackett and Statham (2016), the procurement team's assessment of the effectiveness of the existing tender adjudication procedure is heavily influenced by its transparency, fairness, and efficiency. Clear criteria and consistent implementation of guidelines are critical for establishing equity and trust in the process (Douh, 2015). Furthermore, the capacity to make fast judgments without needless delays leads to a favourable assessment of the method's efficiency (Liu, Wang & Wilkinson, 2016). Ackah et al. (2014) pointed out that streamlined procedures and the use of technology for bid submission and review reinforce this perception, making the process more controllable and less susceptible to human error or bias. Rahmani, Maqsood and Khalfan (2017) reveal that the team's confidence is further increased by the fact that compliance with legal and regulatory standards, along with thorough documentation and transparent audit trails, improve accountability and compliance.

2.12.1 Alternative method to improve tender adjudication

For public procurement, the preferred method is competitive tendering. Clients have different views on how the adjudication process should be conducted as it results in many contractors not having a chance to compete further due to not filling in the form of offer (Feng et al., 2007). Chen et al. (2021) identifies e-Procurement system as the alternative method for improving the effectiveness of the current tender adjudication methods. In addition, Kilinc-Ata (2016) states that the use of an e-Procurement system can transform tender adjudication

by automating and standardizing many components of the process. Furthermore, Taherdoost and Brard (2019) reveals that e-Procurement system enables for electronic bid submission, which streamlines document management and eliminates the risk of errors or omissions associated with paper-based submissions. An e-Procurement system also assures that all bidders have simultaneous access to the same information, which increases transparency and fairness (Kajimbwa, 2018; Gardenal, 2013). Automated checks for compliance with submission standards and eligibility criteria can expedite the preliminary screening process, ensuring that only genuine bids advance to further examination (Jadhav & Sonar, 2009). Furthermore, e-Procurement platforms may feature built-in evaluation tools that enable a more objective and consistent review of bids based on predetermined criteria (García Rodríguez et al., 2020).

However, Eriksson and Westerberg (2011) identify two-stage tendering process as an alternative method, bidders submit proposals in the first stage, which is based on conceptual designs or preliminary requirements; in the second stage, bids are submitted by the shortlisted bidders in full. Gupta and Jana (2003) reveal that framework agreements are long-term agreements with one or more suppliers to provide goods, services, or works under agreed-upon terms and conditions. Under this structure, specific contracts are awarded using mini-competitions or direct awards (Chang, 2014). Although significant research has been conducted to improve tender adjudication process in the Western Cape Province, little attention has been given to the allocation of point system to improve the effectiveness of tender adjudication process.

2.13 Theoretical framework

Procurement theories furnish an organised structure that steers the procurement of goods and services, guaranteeing that procurement endeavours correspond with the strategic goals of an entity (Laffont & Tirole, 1993; Nandankar & Sachan, 2020). The Resource-Based View (RBV) and Transaction Cost Economics (TCE) are two important ideas that emphasise how crucial it is to use special resources and minimize costs in order to obtain a competitive edge (Kim, 2017). TCE is centered on lowering transaction costs, influencing choices about producing or purchasing goods, and managing relationships with suppliers (Augusto & de Souza, 2015). Conversely, RBV highlights the strategic role that procurement plays in augmenting a company's strengths through the selection of suppliers that offer distinctive and complementary resources (Augusto & de Souza, 2015). Neves, Hamacher and Scavarda (2014) reveal that these ideas support the important decision-making processes in procurement, which seek to maximize effectiveness and strategic value.

Other theories, such as Strategic Sourcing and Total Cost of Ownership (TCO), emphasize long-term objectives and detailed cost analysis (Sharma, 2016). Strategic sourcing

integrates procurement activities with organizational goals, using expenditure analysis and supplier segmentation techniques to improve supplier selection and management. Mulk and Sörensen (2022) pointed out that TCO takes into account all of a product's costs throughout its existence, allowing for more informed and cost-effective purchase decisions (Sharma, 2016). Together, these theories form a solid framework for creating efficient procurement strategies that improve operational efficiency, inspire innovation, and promote sustainable practices (Milczarek, Cyplik & Wieczerniak, 2018).

Thus, Figure 2.1 presents the theoretical framework that outlines the process followed for adjudication from the inception stage to the awarding stage. It also reveals the change in policy for adjudication, and most importantly, the gap between the points allocated for price and technical competency, which forms part of the contractor's functionality.

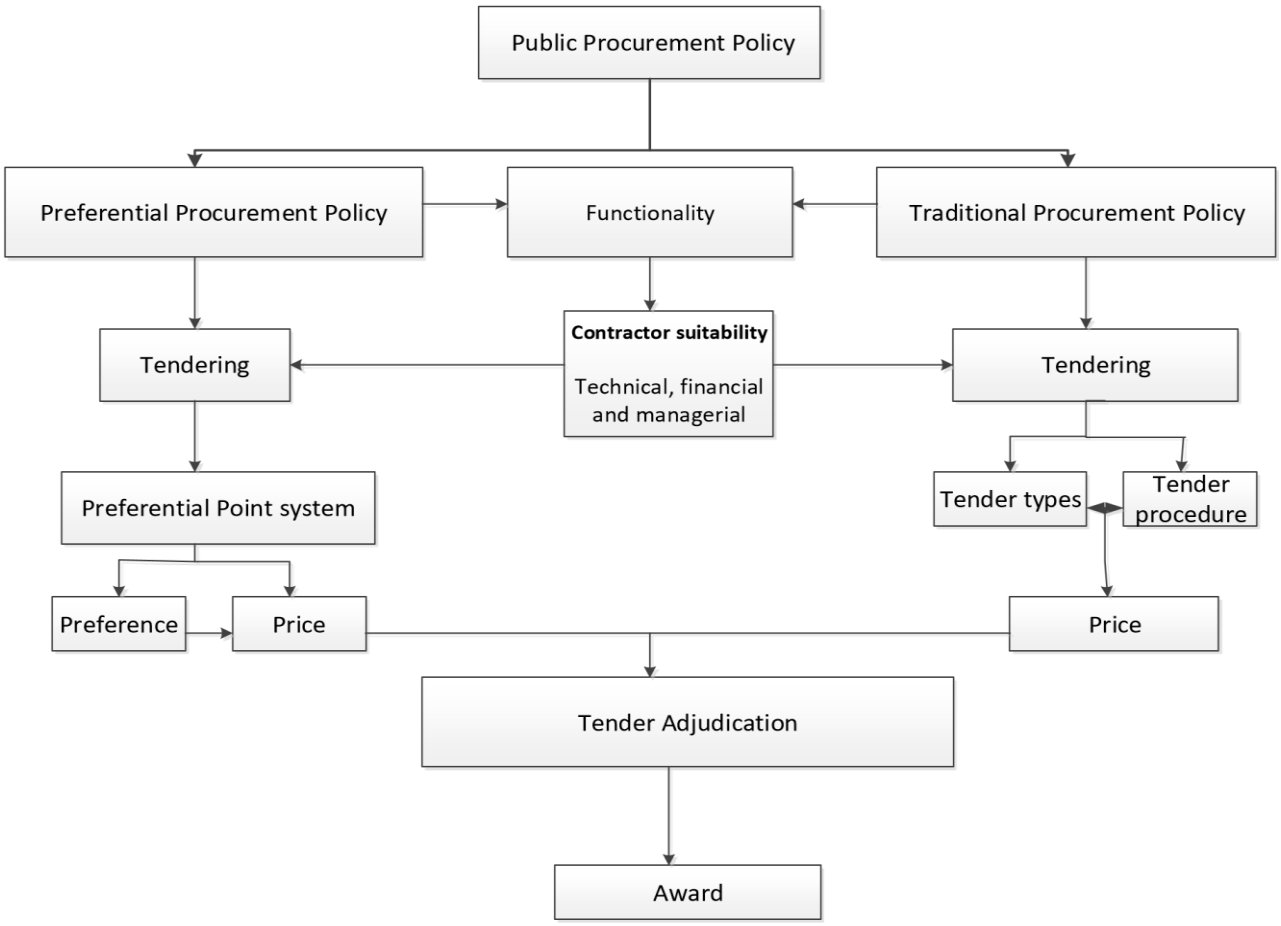

Figure 2.1: Theoretical framework

2.14 Conceptual framework

This research thus investigates and evaluates the effectiveness of the tender adjudication criteria in selecting a competent contractor and bridging the existing gap. It furthermore

investigates effectiveness as a tender adjudication factor in selecting a technically competent contractor.

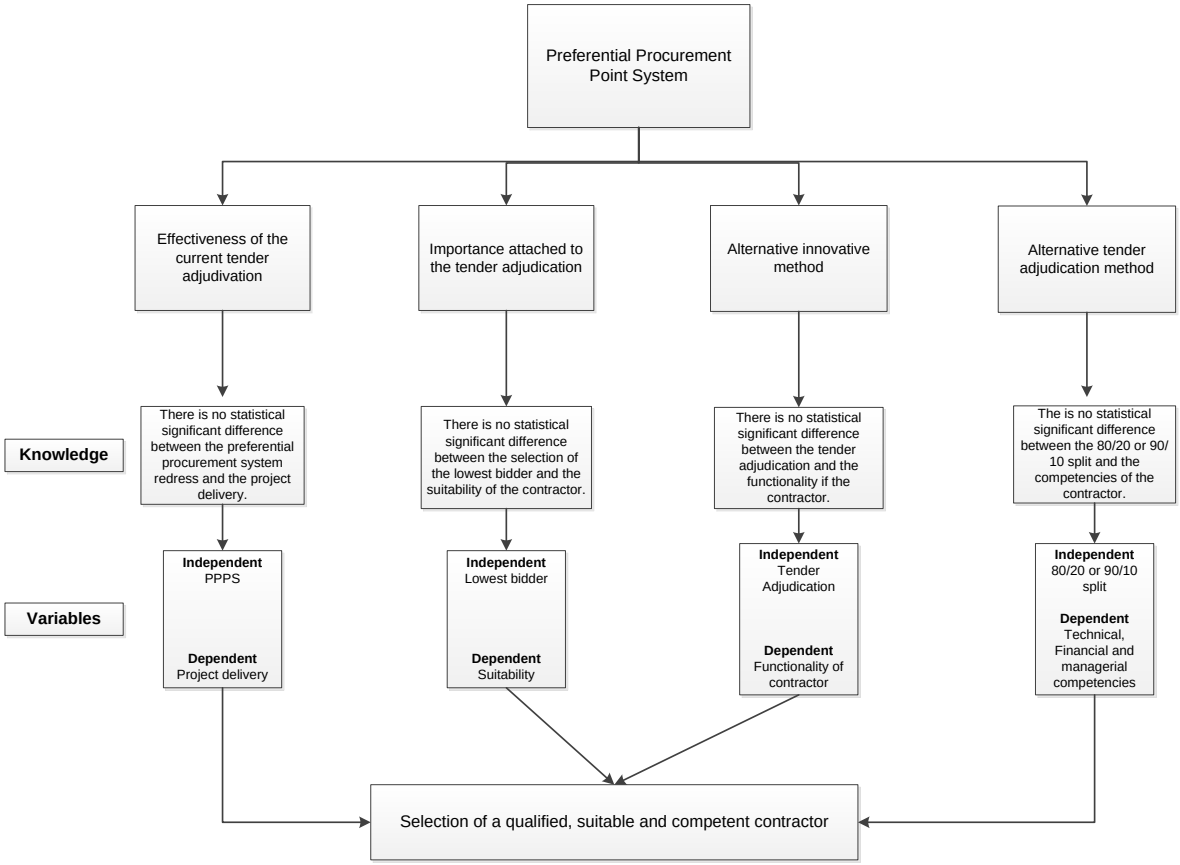

Figure 2.2: Conceptual framework (Source: Researcher)

2.15 Conclusion

Chapter 2 concludes by underlining the need of addressing the identified issues in order to improve the efficiency of tender adjudication in South Africa. The literature lays the groundwork for understanding the current status of tender adjudication, emphasizing the need for reforms and capacity building to improve the public procurement system. Additionally, the government has not yet adopted e-government and e-procurement technologies in public procurement operations. The steps taken by a contractor to secure a contract are lengthy and involve numerous channels before the awarding process commences. While this system may be intended to limit corruption, it appears to create more opportunities for corruption. The are suggestions that funds for projects should be released directly from Parliament and not from the different departments within the government.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology adopted in this study. The suitable research methods adopted to collect information, the analysis and interpretation of the collected data, and how these steps contribute to the objectives of the study, are discussed. The chapter comprises the introduction, research approach and justification, methodological approach, sources of data, sampling, questionnaire design, survey administration, data analysis of both qualitative and quantitative data analysis, reliability analysis, validity analysis and a chapter summary.

3.2 Research methodology

Research methodology is considered a technical system of phases followed to answer the predetermined research problem and subsequent problems throughout the study (Kothari, 2009). These phases are chosen by the researcher through aligning the research problem to the objectives and following a technical process (Saunders et al., 2011). Dawson (2002) posits that research methodology not only guides the research but also enables and equips the researcher to discover relevant findings. In essence, the intricate process of research methodology is an important aspect of analysis and in turn, it provides new information and insights from the information received (Wedawatta et al., 2011). In relation to the proposed study, within the construction management research, the application of a well-suited research methodology provides new perspectives and insights to researchers, categorised within the natural and social sciences domain (Creswell, 2012).

3.3 Research approach

3.3.1 Qualitative research approach

Qualitative research is a practical approach to studying authenticity, where the researcher's source of information is the subject's perspective of reality (Fellows & Liu, 2008). Qualitative research is captured through behaviours, beliefs, opinions, personal views, and experiences of the participants. It provides a level of understanding of knowledge-based information received from the participants and provides an innovative understanding as compared to the quantitative research approach (Mengshoel, 2012). Qualitative research assists in clarifying what the problem may be within the subject of research (Leedy & Ormrod, 2014).

Jonker and Pennink (2011) document the definition of the term *qualitative research* from its derivative term *quality*, which describes the development of knowledge, type of data, the responsive attitude as well as the behaviour of the study participants. Jonker and Pennink

further explain that information received through qualitative research allows the researcher to receive feedback from the perspective of the subjects of the study. Qualitative research is based on theory analysis rather than data frequency accumulation. Qualitative research is therefore conducted using either focus groups, in-depth interviews, reflection, or text revision (Flick, 2011). Creswell and Creswell (2018) note the following advantages of qualitative research:

- Qualitative research can be utilised in any sector, although it is most frequently used in areas such as the social sciences.
- It gathers complicated data based on participants' perspectives and the reasoning behind these ideas.
- In comparison to other types of study, the sample sizes are typically smaller.
- Interviews, focus groups, and ethnographic research are the most widely used techniques.
- Data analysis is typically separated into establishing codes, identifying themes, and summarising findings.

Given the advantages of the qualitative research method, this study adopted qualitative research as part of the mixed methods research approach to enhance the robustness of the findings.

3.3.2 Quantitative research

Quantitative research is based on numerically represented data and the measurement of the collected data (Leavy, 2017). It presents tangible data from a positivist perspective through statistical inferences (Fellows & Liu, 2015). According to Kumar (2011), quantitative research is advantageous in statistically calculating and analysing a large amount of data obtained from prepared questionnaires and surveys. Quantitative research is a broad method of approaching a desired sub-group (Dawson, 2002). For this study, given its cost-effectiveness, quantitative research has been adopted as part of the mixed methods approach to collect information from the Department of Public Works in the Western Cape Province (Creswell & Plano Clark, 2011). This study collected numerical data, which has the following benefits (Creswell & Creswell, 2018):

- Numerical data provides the important facts
- Analysing numerical data can yield important facts and use valuable insights
- More accurate and reliable
- More valuable

3.3.3 Mixed methods research

In recent years, a shift in focus has been noticed in both qualitative and quantitative research (Creswell, 2012). *Mixed methods* is a research approach that incorporates both qualitative and quantitative data. This allows the researcher to gain both a d

eductive and an inductive understanding of the analysed data when answering the research questions (Creswell, 2014). In doing so, the study accommodates all varying types of information without risking the loss of important information (Creswell & Creswell, 2018). The reasoning behind the method is to balance strengths and weakness, and to improving areas that may be lacking (Creswell & Creswell, 2018). However, there could be an imbalance in the amount of data collected using each type of research, where the tendency can be to collect much more quantitative than qualitative data, or vice versa. The purpose of mixed methods is to strike a balance between both approaches (Creswell, 2014). Flick (2011) identifies the following groups of mixed methods research, namely:

- Equivalent status/simultaneous design: QUAL+QUAN
- Equivalent status/sequential design: QUAL→QUAN; QUAN→QUAL
- Dominant/simultaneous design: QUAL+QUAN; QUAN+QUAN

Dominant/simultaneous design: QUAL+QUAN; QUAN+QUAN, was adopted for this research, with simultaneous data collection using both the quantitative and qualitative approach.

Creswell (2014) lists the following characteristics of the mixed methods approach:

- Produce findings for issues relating to qualitative and quantitative approaches.
- Offer the researcher a variety of perspectives and in-depth analysis on the topic.
- Encourage researchers to use various paradigms for qualitative and quantitative research.
- Two approaches can be used to accomplish various objectives for the study.

This study adopted mixed methods (quantitative and qualitative) research; however, the study is dominated by quantitative research with a minimum qualitative approach to achieve the study objectives. Furthermore, the complimentary advantages of qualitative and quantitative approaches solve the shortcomings of one another, providing a more thorough and sophisticated interpretation of the data (Cahapay & Anoba, 2020). Mixed methods are applicable to a broad range of disciplines because to their flexibility and adaptability, which allows researchers to produce practical insights that are pertinent to a variety of tender adjudication teams (De Torres et al., 2024). Overall, the mixed method is preferred because

it can provide a more comprehensive, trustworthy, and nuanced understanding of research problems by addressing both numerical trends and underlying mechanisms or meanings.

3.4 Research design

Research design is based on the concept of defining the research problem and seeking methods to tackle the aim and topic of the research (Kothari, 2009). Pallant (2011) reveals that the research design can be validated by exploring various methods of finding the solution to the research problem. Research design indicates the advanced steps required to reach the objectives of the study (Creswell & Creswell, 2018). Once the researcher has formulated the research questions, they should clearly indicate how they intend to manoeuvre the research design through experimental, quasi-experimental or non-experimental research (Creswell & Creswell, 2018). This study adopted deductive research to achieve the study objectives.

3.4.1 Deductive research method

The deductive research method is a structured approach that begins with a broad idea or hypothesis and then tests it using empirical data (Fellows & Liu, 2015). This method is based on the principles of deductive reasoning, with the research process progressing from general to specific (Fellows & Liu, 2015). Initially, researchers form a hypothesis based on prior knowledge or theory (Creswell, 2014). This hypothesis is then rigorously tested utilizing systematic approaches, which often include quantitative data gathering and analysis (Gupta & Gupta, 2022).

Fellows and Liu (2015) reveal that within the deductive research framework, the emphasis changes to empirically investigating particular facets of a larger theory or notion when a research question is formulated instead of a hypothesis. The study is directed by research questions, which pose questions that can be addressed by methodical data gathering and analysis. The following is the study's primary question: How effective are the present tender adjudication techniques in South African public construction project procurement, and what adjustments may be made to make them more effective? By asking this question, the research is focused on getting quantitative information from the tender adjudication team so that possible relationships can be found through statistical analysis (Creswell & Creswell, 2018).

3.5 Research approach for the study

The mixed methods research design aimed at evaluating the efficiency of tender adjudication methods in public procurement of construction projects in the Western Cape Province of South Africa (Department of Public Works, Department of Transport, Department of Human Settlements, and local government), quantitative data will be collected via a comprehensive survey distributed to the tender adjudication team involved in

the procurement process (McKim, 2017). The survey includes government officials in the tender adjudication process, and procurement officers to investigate their impressions of existing tender adjudication techniques, satisfaction levels, and areas for improvement. To review the performance of existing processes, quantitative criteria such as the impact of tender price, contractors' functionality, and other compliance with procurement requirements were examined (Halcomb & Hickman, 2015).

Qualitative insights were obtained through in-depth interviews with certain tender adjudication teams, to supplement the quantitative phase (Halcomb & Hickman, 2015). The intricacies of participants' experiences, viewpoints, and ideas in tender adjudication procedures was explored through the use of these qualitative approaches (McKim, 2017). This study aims to provide a comprehensive understanding of the advantages, disadvantages, and opportunities for improving the effectiveness and transparency of tender adjudication methods in South Africa's public construction project procurement by integrating findings from both quantitative and qualitative phases.

Several procedures were implemented to ensure the validity of this mixed methods study design analysing the efficiency of tender adjudication techniques in South Africa's public procurement of building projects (Clark & Ivankova, 2015). First, methodological triangulation will be used to correlate quantitative survey data with qualitative insights obtained from interviews. This approach enables for cross-validation of findings, which improves the credibility and dependability of study results (Clark & Ivankova, 2015). Furthermore, the survey instrument was thoroughly reviewed by the research and the supervisor to ensure its clarity, comprehensiveness, and relevance to the study objectives, hence increasing the internal validity of the quantitative data collected.

Furthermore, the general validity and reliability of this research attempt was strengthened by the application of well-established quantitative metrics and qualitative content analysis tool, as well as by the transparent reporting of study methodology and conclusions (Heale & Twycross, 2015; Sürücü & Maslakçi, 2020).

3.6 Population

The population of a study is the total group of individuals or organisations who share the qualities or attributes being researched by the researcher (Leavy, 2017). In the context of investigating the efficiency of the current tender adjudication processes in public construction projects in South Africa, the population includes all essential parties involved in the procurement process. This includes the Department of Public Works, the Department of Transport, the Department of Human Settlements, and the Western Cape's local governments. The population represents the larger universe from which a sample was selected to collect data and insights for the research project. To guarantee a strong

representation of the tender adjudication team and perspectives, participants were selected from each section of the population using a census sampling method (O'Leary, 2010). This method allows for the intentional selection of individuals or groups with diverse experiences and knowledge relevant to the research aims (Flick, 2011). This study seeks to gain a comprehensive understanding of the strengths, problems, and possibilities associated with tender adjudication techniques in the Western Cape Province of South African public construction project procurement by engaging with a diverse variety of stakeholders.

3.7 Sampling technique

Leavy (2017) defines sampling as the design used to carefully select sources of information, which include time, dates, and vicinity to detect the fieldwork. Sampling involves deciding on a manageable group of potential participants. In the case of this study, the potential participants referred to government employees having experience in tender adjudication. It is important to note that not all government employees are involved or have experience in being part of the adjudication committee. The function of sampling is to provide the correct demographics to represent the subject of focus (Creswell & Creswell, 2018), which assists in enabling the correct data collection and analysis methods (Fellows & Liu, 2015).

According to Biggam (2011), probability sampling is randomly selecting a subset of individuals from a population group for data collection. This study adopted the non-probability sampling technique using a census sampling method, with a stratified sample for the interviews, to select the adjudication committee within the Department of Public Works, Department of Transport, Department of Human Settlements, and local government in the Western Cape to achieve the objectives of this study. According to supply chain management guidelines, an evaluation committee for bids should have at least five members (SCM, 2006). The Bid evaluation committees comprise a chairperson, technical experts, financial experts, a legal advisor, a procurement specialist, user representatives, a quality assurance expert, a risk management expert, a project manager, an environmental/ sustainability expert, a compliance officer, and an operations manager. Furthermore, Malterud et al. (2018) summarised that determining a sample size may not always be required for research involving a small or easily accessible population. Thus, in this study, it is not necessary to determine the minimum sample as the sample size affects the tender adjudication committee in the Western Cape Provinces within the Department of Public Works, Department of Transport, Department of Human Settlements, and local government.

To obtain further and richer data beyond quantitative questionnaire surveying, the researcher conducted qualitative research and made use of semi-structured interview questions posed to a small number of participants. A total of three (3) participants were randomly selected from the government sphere to participate in the interview session as a measure to validate the results obtained from the quantitative data.

3.8 Questionnaire design

A questionnaire is a tool used to collect information through conducting a survey. It is the basis of communication between the researcher and the participant. It is a suitable tool for information collection to obtain information from a larger collection of respondents, as data collection may be time-consuming and expensive (Eriksson & Kovalainen, 2008). Leavy (2017) states that questionnaires, just like other methods of data collection, require precise planning and design. Questionnaires remove any subjectivity and is completely objective (Bornstein et al., 2013). The questionnaire contained close-ended questions to gather information from the Department of Public Works to record their perspective and ideas relating to the efficiency of tender adjudication in the public sector. The design of a data collection tool was influenced by various factors, such as the objectives and the nature of the data needed. The research problem and questions were formulated based on the initial problem and the literature review (Bornstein et al., 2013).

The questionnaire was structured into sections, where each section aligned to an objective of the study. Table 3.1 illustrates the relationship between the sections and the study objectives.

Table 3.1: Questionnaire design

Section	Section title	Objectives
A	Biographical information	To evaluate reliability of experience
B	To evaluate stakeholders' perception of procurement	Objective 1
C	To establish the order of importance attached to the current tender adjudication criteria. 3.1: To establish the order of importance of the PPPFA point system. 3.2: The assess the re-allocation of the current point system used.	Objective 2
D	To ascertain whether an alternative method can improve the efficiency of the tender adjudication method. 4.1: To ascertain whether an alternative method can be adopted in the tender adjudication process.	Objective 3

Section	Section title	Objectives
	4.2: To ascertain the rationale for an alternative method.	

3.9 Close-ended questionnaire

Close-ended questions are created to restrict the respondents' responses to the fixed questions designed by the researcher (Fellows & Liu, 2015). Close-ended questionnaires were distributed to respondents through email, posting (snail mail), and telephone interviews. The majority of the questionnaires were completed and returned through email and snail mail. Each question triggered a variable that was coded with a number (Denscombe, 2010). The types of questions were formulated based on the objectives of the study, where respondents were asked to respond in a restricted manner. An unbalanced five-point Likert scale was used to rate the questionnaire. For example, a Likert scale such as strongly disagree (SD) =1, disagree (D) =2, neutral (N) = 3, agree (A) =4, and strongly agree (SA) = 5 was adopted in this study. Using a five-point Likert scale in questionnaires for bid assessment committee members provides an organised method for gathering nuanced thoughts and perceptions about the review process (Robertson, 2021). This method allows respondents to express their level of agreement or disagreement with specific assertions, providing useful insights into different elements such as criterion clarity, training sufficiency, confidence in evaluation abilities, and overall satisfaction with outcomes (June et al., 2023). The questionnaires were formed in was formed in five (5) sections namely Section A relating to the demographic information of the respondents, section B relating to the perception of the procurement stakeholders regarding the efficiency of the current tender adjudication method, section C order of related to importance attached by the procurement stakeholders to the current tender adjudication criteria, section d related to alternative method to improve the efficiency of the tender adjudication process and lastly section e focusing on alternative tender adjudication method based on the views of participants.

3.10 Semi-structured interview

For this study, semi-structured interviews were adopted to gather data from the Department of National Public Works and Infrastructure (DNPWI) tender adjudication team to achieve the study objectives. Semi-structured interviews allow the interviewer to steer the discussion in a fruitful direction to gain the opinions, experiences, and knowledge of participants. Saunders et al. (2011) add that interviews are flexible, in-depth, and encourage creativity and discussions over conflict. The semi-structured interview further ensures that clear findings are derived from the analysed data.

For this study, interviews were adopted as a data collection technique to validate the quantitative data. Three (3) government spheres were selected using a stratified sampling technique, with at least one participant in each (DNPWI) team taking part in the interviews. Stratified sampling is a statistical and research technique that ensures that subgroups within a population are proportionally represented in the sample under study (Setia, 2016). In this study, both online (teams and Zoom) and physical interviews were used to collect the qualitative data from the participants. An initial email was sent to the participants to request the participants to partake in the interview session. The Researcher systematically examines the viewpoints of different stakeholders, such as government officials, procurement officers, and project managers, through semi-structured interviews (Ebekozien et al., 2024). It is possible to thoroughly investigate important topics including fairness, transparency, decision-making standards, procedural bottlenecks, and stakeholder satisfaction to obtain an understanding of the difficulties and modifications that must be made to the tender adjudication procedure (Amadi et al., 2020).

3.11 Quantitative analysis

To convert data into information, data analysis is needed. Quantitative analysis is the process of discovering and describing data patterns through calculated processes (Russell & Purcell, 2009). Leavy (2017) differentiates between quantitative and qualitative analysis, stating that quantitative analysis is done to provide a mathematical outcome. It consists of variables that are initiated by a hypothesis or concept (Leavy, 2017). The quantitative data obtained from the survey questionnaire were analysed using Statistical Package for the Social Sciences (SPSS) 25 software and descriptive statistics. In this study mean ranking, standard deviation (std), and percentages are statistical measures used to examine and understand data, particularly in research that use rankings or ordinal data. These indicators, taken together, provide a thorough picture of how alternative tender adjudication procedures are regarded and assessed by stakeholders in South Africa's construction procurement sector, allowing for the identification of strengths, flaws, and opportunities for improvement (Gadermann et al., 2019). Furthermore, exploratory factor analysis (EFA) was carried out to determine a measure's factor structure and assess its internal reliability (Pallant, 2011). Furthermore, an ANOVA test was used in this study. ANOVA (Analysis of Variance) is a statistical approach used to compare the means of three or more samples and determine if at least one sample mean is substantially different from the others (Leavy, 2017).

3.12 Content analysis

Content analysis is used to analyse oral, scripted, and visual communication. It is used for both quantitative and qualitative data (Creswell & Creswell, 2018). According to Fellows and Liu (2015), content analysis is the study of content communication whereby conclusions are formulated from the analysed data. The data are sourced from radio, documents, letters, and transcripts of the conversation. Petscher et al. (2013) further add that content analysis aligns with document analysis and observation. Content analysis allows the researcher to assess theoretic concepts by distilling words into smaller scale categories (Patel & Patel, 2019). Content analysis provides the researcher with and understanding of textual data obtained from qualitative research.

For this study, content analysis was adopted for the qualitative data collected from the interviews and observations to determine the efficiency of tender adjudication in public procurement. Furthermore, content analysis was used to understand the perspectives of the participants and deriving themes in alignment with the study's objectives.

3.13 Reliability and validity of the data

Reliability and validity are concepts utilised to measure the credibility of the findings and to prove truthfulness (Nieuwenhuis, 2007). Moreover, Creswell (2012) argues that although engineering fields may have their own standard measuring, construction management measurements are generally uniformly defined. Nieuwenhuis (2007) concurs that perfect reliability and validity are nearly impossible to achieve, especially in social research since social theory is often not directly noticeable or diffused and can be ambiguous. Therefore, a measurement can be valid but lacking reliability when measuring the same construct consistently. Similarly, a measurement can be reliable but lacking validity when measured using the same utensil, which, in turn, may not provide the same outcomes. In this study, the validity of the survey question was done through an extensive review of the questionnaires by the supervisor to ensure that there are no biases in the study. Furthermore, this study upholds both validity and reliability standards and ensures that participants' time and contributions are respected by producing meaningful and accurate results.

3.14 Chapter summary

This chapter reflected on the research methodology adopted for the study. Various research approached were discussed and the approach selected for the study has been motivated clearly. Mixed methods research (a combination of quantitative and qualitative research) was adopted, and interviews, questionnaires, and observations were used as data collection tools. The data analysis methods applied for both the quantitative and the qualitative

research were explained. Furthermore, it was indicated how the reliability and validity of the data were maintained.

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATIONS AND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis of the data obtained from interviews conducted and a questionnaire survey employed to procurement stakeholders. It examines the efficiency of the tender adjudication process and highlights alternative methods of adjudication in public procurement for construction projects in South Africa. The quantitative data collected were analysed using SPSS. Statistical analyses were performed to interpret the data, and the implications of the observed results are discussed in detail. The results are presented in tables. For the qualitative data, content analysis was performed to analyse the data obtained from the observations and semi-structured interviews. Emphasis is placed on the three most significant ranked factors as well as the least significant ranked factors. This chapter also, discusses the perceptions of procurement stakeholders regarding the efficiency of the current tender adjudication method, the order of importance assigned by procurement stakeholders to the current tender adjudicated criteria, and an alternative innovative method that may improve the efficiency of the tender adjudication process.

4.2 Rational for response rate

The quantitative data were gathered using a survey questionnaire. In total, four departments in the Western Cape Province were selected to investigate the efficiency of the tender adjudication of construction projects in public procurement in South Africa. The four departments were the Department of Public Works, the Department of Transport, the Department of Human Settlements, and the Western Cape local government. Tender adjudication committee members—government employees involved in tender adjudication in a calendar year—are selected annually. The respondents in this study included directors, quantity surveyors, architects, project managers, maintenance managers, and supply chain managers. All the respondents were involved in the adjudication process in the year of this study's data collection, and all have experience with the adjudication process. The respondents were all members of adjudication committee, which typically comprises no more than 12 members in each department of the government sphere (national, provincial, and local). Of the 48 questionnaires administered using Google Forms, a total of 37 questionnaires were retrieved and correctly completed, representing a 77% response rate (Figure 4.1).

Table 4.1: Respondents per government department

No.	No. of adjudication committee members (selected in year of data collection)	Government departments	Retrieved and correctly completed	Response rate in percentage
1	12	Department of Transport	9	75%
2	12	National Public Works	11	91%
3	12	Human Settlement	9	75%
4	12	Local government (Western Cape)	8	66%
Total	**48**		**37**	**77%**

4.3 Biographic information

4.3.1 Current position of respondents

Table 4.2 shows that 35.1% of the respondents were identified as quantity surveyors, with an exceptional 13.5% of the respondents being chief construction project managers, and 10.8% professional project managers. Eight-point-one percent (8.1%) of the respondents were project directors, and the same percentage of respondents were architects, followed by deputy directors of facilities management (5.4%), chief works managers (5.4%), regional managers (2.7%), director property directors (2.7%), and SCM directors (2.7%). Table 4.2 shows that the respondents were dominated by quantity surveyors. According to Sheikh, Abelsen and Olsen (2014), the current positions of the various parties in the tender adjudication process government agencies, contractors, regulatory organisations, and the public have a significant impact on the efficiency of tender adjudication techniques in South Africa.

Table 4.2: Current position of the respondents

Current Position	No.	Percentage %	Cumulative percentage %
Regional Manager	1	2.7	2.7
Director Property	1	2.7	5.4
Director Projects	3	8.1	13.5
Quantity Surveyor	13	35.1	48.6
Architect	3	8.1	56.7
Director Supply Chain Management	1	2.7	59.4
Deputy Director Facilities Management	2	5.4	64.8
Professional Project Manager	4	10.8	75.6
Chief Construction Project	5	13.5	89.1
Chief Works Manager	2	5.4	94.5
Others	2	5.4	100
Total	**37**	**100**	

4.3.2 Experience of the Respondents

Table 4.3 indicates the experience of the respondents in their current position related to the tender adjudication process. In total, 56.8% of the respondents' experience in their current position (at the time of this study's data collection) ranged between 1 and 5 years; 24.3% of the respondents ranged between 6 and 10 years of experience; and 10.8% of the respondents indicated relevant experience between 11 and 15 years. A mere 5.4% of the respondents had relevant experience ranging between 16 to 20 years of experience in the construction industry, while only 2.7% of the respondents indicated relevant experience ranging between 21 to 25 years in the current position they occupied. This shows that most of the employees in tender adjudication had less than 6 yours of experience in their current position at the time of the data collection. Thus, Saunders, Abel and Lyratzopoulos (2015) summarised that respondents' experience with South Africa's tender adjudication process has a substantial impact on its efficiency and effectiveness. Furthermore, McGrath et al. (2015) reveal that government personnel with strong procurement and project management backgrounds speed the process, assuring compliance and high-quality evaluations.

Table 4.3: Experience in current position

Years	No.	Percentage%	Cumulative percentage%
1 – 5 years	21	56.8	56.8
6 – 10 years	9	24.3	81.1
11 – 15 years	4	10.8	91.9
16 – 20 years	2	5.4	97.3
21 – 25 years	1	2.7	100
Total	**37**	**100**	

4.3.3 Participation experience in the awarding of tenders

Table 4.4 presents the participation experience of the respondents related to the awarding of tenders in one year. In total, 51.4% of the respondents have been involved in tender awarding of between 1 and 5 projects, followed by 21.6% of respondents with experience in tender awarding for 6 to 10 projects in one year. Thirteen-point-five percent (13.5%) of the respondents indicated that they have no experience in the tender awarding process. A notable 8.1% of the respondents indicated their experience in tender awarding as between 11 and 15 projects in a year, with 5.4% of respondents indicating 16 or more projects.

Table 4.4: Participation experience in the awarding of tenders

Awarding projects	No.	Percentage%	Cumulative percentage%

0 projects	5	13.5	13.5
1 – 5 projects	19	51.4	64.9
6 – 10 projects	8	21.6	86.5
11 – 15 projects	3	8.1	94.6
16 and above	2	5.4	100
Total	**37**	**100**	

4.3.4 Highest formal qualification

Table 4.5 presents the formal education of the respondents. An overwhelming 48.7% of the respondents said they hold a Bachelor's/Honours degree qualification, and 29.7% of the respondents indicated a National Diploma qualification. A mere 10.8% of the respondents said they hold a Master's degree, and the same percentage of respondents indicated that they have a matric certificate at the time of the data collection. Thus, most staff involved in tender adjudication were in position of a formal qualification. It should be noted that no respondents held a Doctoral degree, thus, there is a need for staff development. The highest qualifications of respondents involved in South Africa's tender adjudication procedure are critical to its efficiency and effectiveness (Gupta, Dubey & Gupta, 2019). Additionally, Ribeiro et al. (2020) pointed out that government officials, contractors, regulatory bodies, and stakeholders with advanced degrees and professional certifications make better decisions, submit higher-quality work, provide effective supervision, and promote openness.

Table 4.5: Highest formal qualification

Qualification	No.	Percentage%	Cumulative percentage%
Matric	4	10.8	10.8
Diploma	11	29.7	40.5
Bachelor's/Honours degree	18	48.7	89.2
Master's degree	4	10.8	100
Doctoral degree	0	0	100
Others	0	0	100
Total	**37**	**100**	

4.4 Reliability testing

A scale's reliability is measured by Cronbach's alpha coefficient, which ranges from 0 to 1. The closer the coefficient is to 1, the more reliable is the scale. Using Cronbach's alpha, Pallant (2011) recommends that values below 0.60 are unacceptable; values with a coefficient of 0.70 are viewed as low reliability, values containing a coefficient of 0.80 are viewed as moderately reliable, and values with a coefficient of 0.90 are viewed as highly reliable. Reliability coefficients are likely to be lower when there is a smaller number of items.

In this study, it was noted that the values were above 0.70. Table 4.6 shows that the Cronbach's alpha reliability of the quantitative questions was satisfactory.

Table 4.6: Reliability test

Question No.	Headings	No. of items	Cronbach's alpha coefficient value	Rank
1	Perception of procurement stakeholders regarding the efficiency of the current tender adjudication	10	0.86	Moderate
2	Order of importance attached to the current tender adjudication criteria	6	0.78	Low
3	Re-allocation of the percentage weightings of the current tender adjudication criteria	6	0.92	High
4	Alternative innovation method for public procurement	7	0.83	Moderate
Sum	**All questions combined**	**29**	**0.83**	

4.5 Efficiency of the tender adjudication process in the public procurement of construction projects

4.5.1 Perception of procurement stakeholders regarding the efficiency of the current tender adjudication method

Table 4.7 shows the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method. The respondents were asked to indicate their level of agreement of the efficiency of the current tender adjudication method and criteria, using a 5-point Lickert scale: Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; Strongly Agree = 5. Table 4.7 shows that the respondents agreed that the SCM team involved in tender adjudication do not have sufficient knowledge of the PPPFA to select a suitable contractor—an overwhelming 67.8% of the respondents agreed that the tender adjudication team have insufficient knowledge of the PPPFA. This factor is ranked first with a mean score of (MS=4.31).

Most (81.3%) of respondents were concerned that the current tender adjudication process has loopholes that permit corrupt activities to take place in tender adjudication. This is a dominant factor affecting tender adjudication in the public sector with a mean score of (MS=4.21). A notable 83% of the respondents agreed that many contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project (MS=4.21), and this affects the efficiency of tender adjudication. However, the loopholes that permit corrupt activities in the tender adjudication process is more significant, with at standard deviation of 0.631. Thus, although, these two factors share the same mean score, this study adopted the standard deviation to discover the most significant factor influencing the effectiveness of the current tender adjudication process. According to Bruce,

Bruce and Gedeck (2020), when comparing datasets with comparable mean scores, it is critical to examine the standard deviation (std) in order to acquire a thorough knowledge of the data distribution. When comparing datasets with the same mean, standard deviation helps the researcher to distinguish them based on their distribution (Althnian et al., 2021).

The respondents agreed that the effectiveness of the tender adjudication process to select the most suitable service provider for a construction project influences tender adjudication; thus, with 75.9% of the respondents agreeing, this statement is ranked third with a mean score of (MS=4.13).

Table 4.7 furthermore indicates that 78% of the respondents agreed that the tender adjudication process is not fair in selecting a suitable contractor for construction projects; this statement is therefore ranked fourth with an overwhelming mean score of (MS=4.0). It is for this reason that numerous contractors 'miss out' on construction projects. In total, 77.9% of the respondents indicated that the current tender adjudication process used under the PPPFA is biased in selecting a suitable service provider for construction projects, with a mean score of (MS=3.73) and a ranking of fifth.

Although the majority of the respondents agreed that current tender adjudication in South Africa is biased and not fair, 77.9% of them felt that the tender adjudication method is effective in assisting with the selection of a suitable service provider (MS=3.61). In addition, the PPPFA was recognised by 76.2% respondents as a significant tool in awarding construction tenders to contractors (MS=3.57). Notably, there seems to be no transparency in the current tender adjudication process, with 66.1% of the respondents agreeing with this statement and with a mean score of (MS=3.41).

The least recognised factor influencing the current tender adjudication process is underperforming service providers, which can be attributed to the ineffective selection method used in the current tender adjudication process. An overwhelming 67.8% of the respondents agreed that this statement affects the tender adjudication process, with a mean score of (MS=3.17), thereby ranking this factor as the lowest in terms of mean rankings. It should be noted that the average mean score is (MS=3.84), indicating that all these statements affect the tender adjudication process in South Africa.

Factor analysis: Identifying the perception of procurement stakeholders regarding the effectiveness of the current tender adjudication method. In this study, factor analysis was performed to discover the perception of procurement stakeholders regarding the effectiveness of the current tender adjudication. A total of 10 tender adjudication processes

perceived by the current tender adjudication team were evaluated to determine the most important adjudication method used. In addition, factor analysis (FA) was used to minimize and categorize the most important adjudication method used in public procurement. This evaluation was also carried out to ensure the consistency of the quantitative analysis. In addition, principal component analysis was employed to extract the variables. Principal Component Analysis (PCA) is a factor analysis technique that identifies components or factors among intercorrelated data (Dehkordi et al., 2021; Cureton & D'Agostino, 2013; Kline, 2014). The rotating component matrix improves PCA results and simplifies interpretation by identifying optimal loading patterns (McDonald, 2014). Table 4.8 shows the results of the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests for sphericity. Both KMO and Bartlett's test of sphericity define the minimum criteria that data must fulfil in order to be considered significant for factor analysis. Shrestha (2021) and Pallant (2012) and Napitupulu, Kadar and Jati (2017) suggest that for significant factor analysis, the value of KMO should be between 0 and 1, with a minimum of 0.60. Furthermore, according to Shrestha (2021) and Thao, Thao and Tuyet (2022), the Bartlett test is a measure of the association between variables, and the Bartlett test requirements are taken into account in this study. To consider component analysis significant and suitable, the Bartlett test associated with significance level should be $p<0.005$. A KMO value of 0.802 is reported in Table 4.8, which is greater than 0.60, which is the minimum value. As summarised by Shrestha (2021) if the KMO value is less than 0.6, it indicates inadequate sampling and requires corrective action. Moreover, Bartlett's test sphericity was 316.243 associated with a significance level of 0.001, which is lower than $p<0.005$. Factor analysis can be performed on the results because they meet the minimum requirements (Shrestha, 2021; Thao et al., 2022).

After determining the significance of variables, the next step is to extract factors. To ensure the perception of procurement stakeholders regarding the effectiveness of the current tender adjudication method. Table 4.9 presents the eigenvalue of a square matrix of the two (2) extracted components comprising 3.856 and 1.587. Tables 4.9 also shows the highest extracted variance with 42.84% and the subsequent component is 17.63% of the variance. Table 4.9 presents the collective components extracted constitute 60.47% of the variance, and these components are most important for the perception of procurement stakeholders regarding the effectiveness of the current tender adjudication.

In this study, a total of 10 variables were evaluated to determine the strategies used by schools in facilities management practices to improve the efficiency of school maintenance programs. This research uses the analysis of principal components to do factor analysis. Table 4.8 displays the results of the KMO measure for adequate sampling and Bartlett's test for sphericity. Shrestha (2021) and Pallant (2012) proposed a Kaiser-Meyer-Olkin value of

0.60, however, the actual value was 0.802. Bartlett's test of sphericity yielded a significant result of p=0.001, which is lower than the suggested value of 0.005 (Shrestha, 2021). Table 4.10 presents the component matrix used for loading two (2) components. In this study, the values less than 0.30 were suppressed and all the values presented in Table 4.10 are greater than 0.30. It is necessary to exclude cases to prevent the overestimation of factors in a large dataset (Yong & Pearce, 2013). the perception of procurement stakeholders regarding the effectiveness of the current tender adjudication, the variable that is covered in component 1 is "*the effectiveness of the tender adjudication process in selecting the most suitable service provider for a construction project influences the tender adjudication process*" and component 2 is "*the tender adjudication process is effective in assisting with the selection of a suitable service provider*".

Table 4.7: Perception of procurement stakeholders regarding the efficiency of the current tender adjudication method

Statement (N=37)	No.	1	2	3	4	5	MS	Std.	Rank
The Supply Chain Management (SCM) team involved in the tender adjudication process do not have sufficient knowledge of the Preferential Procurement Policy Framework Act used in the adjudication process to select a suitable contractor.	37	10.2	0.0	22	45.8	22	4.31	0.721	1
The current tender adjudication process has loopholes that permit corrupt activities.	37	3.4	13.6	5.1	23.7	57.6	4.21	0.631	2
Many of the contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project.	37	0.0	5.1	11.8	25.6	57.4	4.21	0.907	2
The effectiveness of the tender adjudication process to select the most suitable service provider for a construction project influences the tender adjudication process.	37	0.0	8.4	15.7	42.3	33.6	4.13	0.629	3
The tender adjudication process is not fair in the selection of a suitable contractor for construction projects.	37	0.0	1.7	22.0	40.8	37.2	4.00	0.889	4
The current tender adjudication process used under the Preferential Procurement Policy Framework Act is biased in selecting a suitable service provider for construction projects.	37	0.0	3.4	18.6	59.3	18.6	3.73	0.803	5
The tender adjudication process is effective in assisting with the selection of a suitable service provider.	37	0.0	5.1	16.9	59.3	18.6	3.61	0.793	6
The Preferential Procurement Policy Framework Act is an effective policy in the tender adjudication of selecting a suitable contractor for construction projects.	37	0.0	1.7	22.0	59.3	16.9	3.57	0.923	7

Statement (N=37)	No.	1	2	3	4	5	MS	Std.	Rank
There is no transparency in the current tender adjudication process.	37	0.0	5.1	28.8	39.0	27.1	3.41	0.651	8
Underperforming service providers can be attributed to an ineffective current tender adjudication process.	37	0.0	15.3	16.9	22.0	45.8	3.17	0.990	9
Composite score average							**3.84**		

Table 4.8: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.802
Bartlett's Test of Sphericity	Approx. Chi-Square	316.243
	Df	36
	Sig.	<.001

Table 4.9: Total Variance Explained by components

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.856	42.843	42.843	3.856	42.843	42.843
2	1.587	17.631	60.474	1.587	17.631	60.474
3	.832	9.248	69.722			
4	.659	7.326	77.048			
5	.579	6.431	83.479			
6	.475	5.282	88.761			
7	.397	4.410	93.171			
8	.361	4.014	97.185			
9	.307	3.872	98.289			
10	.253	2.815	100.000			
Extraction Method: Principal Component Analysis.						
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.						

Table 4.10: Component Matrixa for the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method

	Component	
	1	2
The Supply Chain Management (SCM) team involved in the tender adjudication process do not have sufficient knowledge of the Preferential Procurement Policy Framework Act used in the adjudication process to select a suitable contractor		
The current tender adjudication process has loopholes that permit corrupt activities	.596	.598
Many of the contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project	.771	

The effectiveness of the tender adjudication process in selecting the most suitable service provider for a construction project influences the tender adjudication process	.792	
The tender adjudication process is not fair in the selection of a suitable contractor for construction projects	.685	.737
The current tender adjudication process used under the Preferential Procurement Policy Framework Act is biased in selecting a suitable service provider for construction projects	.717	
The tender adjudication process is effective in assisting with the selection of a suitable service provider	.684	.821
The Preferential Procurement Policy Framework Act is an effective policy in the tender adjudication of selecting a suitable contractor for construction projects	.654	
There is no transparency in the current tender adjudication process	.728	
Underperforming service providers can be attributed to an ineffective current tender adjudication process	.540	
Extraction Method: Principal Component Analysis.		
a. 2 components extracted.		

4.5.2 Order of importance attached by procurement stakeholders to current tender adjudication criteria

Table 4.11 shows the order of importance attached by procurement stakeholders to the current tender adjudication criteria, which are: *price*, *points for HDI status/BEE/B-BBEE*, *points for youth*, *functionality*, *points for disability*, *points for gender equity*. The respondents were asked to indicate their level of agreement with the order of importance of the current tender adjudication criteria, using a 5-point Lickert scale: Very useless = 1; Useless = 2; Note sure = 3; Useful = 4; Very useful = 5. In total, 84.8% of the respondents agreed that the tender price is the most useful criterion in the tender adjudication process, ranked first with a mean score of (MS=4.02). In the same vein, 84.8% of the respondents also argued that points for HDI status/BEE/B-BBEE is one of the useful criteria in tender adjudication, ranked second with a mean score of (MS=3.97). In addition, (88.1%) of the respondents believed that points for youth is very useful in tender adjudication, ranked third according to mean score (MS=3.89). Seventy-seven percent (77.9%) of the respondents opined that the functionality of the company is significant in the tender adjudication process, ranked fourth with a strong mean score of (MS=3.84). Table 4.11 furthermore shows that 84.3% of the respondents were of the view that points for disability affect the tender adjudication process in South Africa, ranked fifth (MS=3.78). Thus, the tender adjudication stakeholders do consider these criteria when selecting a suitable contractor for potential project awarding. The criteria ranked the lowest (least) is the points for gender equity, with 82.4% of the respondents agreeing that points for gender equality is useful in the tender adjudication process (MS=3.58). Notably, all of these factors are useful, as the joint mean score is above 3.00, and the average mean score is (MS= 3.85).

To determine whether there is agreement on the effectiveness of the order of importance assigned by procurement stakeholders to tender adjudication criteria, an ANOVA test was used to investigate if there is a significant difference in the effectiveness of the current tender adjudication process across the various participation experiences in the tender award of a construction project. Table 4.12 shows the ANOVA test findings, which show that there are no significant differences in personnel management methods based on different involvement experiences in the tender award, since the significant level is $p > 0.05$.

Table 4.11: Order of importance assigned by procurement stakeholders to tender adjudication criteria

Criteria	No.	1	2	3	4	5	MS	Std.	Rank
Price	37	0.0	3.4	11.8	40.7	44.1	4.02	0.846	1
Points for HDI status/BEE/B-BBEE	37	0.0	3.4	11.8	47.5	37.3	3.97	0.762	2
Points for youth	37	0.0	0.0	11.8	55.9	32.2	3.89	0.826	3
Functionality	37	0.0	1.7	20.3	57.6	20.3	3.84	0.804	4
Points for disability	37	0.0	1.7	16.9	64.4	16.9	3.78	0.867	5
Points for gender equity	37	0.0	0.0	17.0	62.7	19.7	3.58	0.704	6
Composite score average							**3.85**		

Table 4.12: ANOVA test for the order of importance assigned by procurement stakeholders to tender adjudication criteria

		df	F	Sig.
Price	Between Groups	3	.316	.813
	Within Groups	23		
	Total	25		
Points for HDI status/BEE/B-BBEE	Between Groups	3	.929	.433
	Within Groups	23		
	Total	25		
Points for youth	Between Groups	3	.580	.630
	Within Groups	23		
	Total	25		
Functionality	Between Groups	3	4.027	.012
	Within Groups	23		
	Total	25		
Points for disability	Between Groups	3	1.753	.167
	Within Groups	23		
	Total	25		
Points for gender equity	Between Groups	3	1.826	.153
	Within Groups	23		
	Total	25		

4.5.3 Re-allocation of percentage weightings of current tender adjudication criteria

The respondents were given the opportunity to re-allocate the percentage weightings of the current tender adjudication criteria. Table 4.13 shows that 49% of the respondents agreed that the functionality of the firm is significant in identifying the most suitable contractor to undertake the project. This criterion was ranked first with and overwhelming mean score of (MS=4.37). Furthermore, price was ranked second, with 45% of the respondents in favour

of this criterion influencing the competitiveness of the contractor in tender adjudication, with a mean score of (MS=4.19). Notably, the respondents agreed that points for youth is significant in the tender adjudication process, ranked third with a mean score of (MS=3.98). Five percent (5%) of the respondents recognised this criterion as favourable.

Table 4.13: Re-allocation of percentage weighting in current tender adjudication

Criteria	No.	MS	Weight in percentage %	Rank
Functionality	37	4.37	46%	1
Price	37	4.19	45%	2
Points for youth	37	3.98	5%	3
Points for disability	37	3.82	2%	4
Points for gender equity	37	3.78	1%	5
Points for HDI status/BEE/B-BBEE	37	3.71	1%	6
Total		**3.98**	**100**	

4.5.4 Alternative innovation method to improve the efficiency of the tender adjudication process

The respondents were asked to suggest alternative public procurement methods/criteria that can be adopted in the tender adjudication process. Table 4.14 presents the alternative criteria proposed by the respondents. The results in Table 4.14 show that *pricing* is the primary objective of the adjudication team, with nine respondents rating the importance of pricing between 61% and 70%, one respondent rating the pricing importance between 51% and 60%, and one respondent rating the pricing importance between 31% and 40%. Thus, in total, 11 of the 37 respondents (29.73%) ranked the tender price first.

On the hand, a significant number of respondents (27.03%) noted *functionality* as most significant criterion. Overall, functionality has been ranked second in order of importance. Six respondents rated this alternative approach's importance between 61% and 70%, three respondents rated the importance between 51 and 60%, and one respondent rated the importance between 41% and 50%. Thus, 10 of 37 respondents agreed that this factor can still fit into an alternative tender adjudication method.

Gender has been ranked third in importance by 10.81% of the respondents. One respondent rated the importance between 51% and 60%, and three respondents rated the importance between 31% and 40%.

The following alternatives were also indicated by the tender adjudication procurement team as important alternate criteria: experience, locally based suppliers, youth, HDI, disability, and the ability to complete the project on time.

Table 4.14: Alternate criteria to improve the efficiency of tender adjudication

Alternate criteria	1%-10%	11%-20%	21%-30%	31%-40%	41%-50%	51%-60%	61%-70%	Above 70%	Total No.	Percentage %	Rank
Price				1		1	9		11	29.73%	1
Functionality					1	3	6		10	27.03%	2
Gender				3		1			4	10.81%	3
Experience						2	1		3	8.11%	4
Locally based supplier							3		3	8.11%	4
Youth						2			2	5.41%	5
HDI							2		2	5.41%	5
Disability						1			1	2.70%	6
Ability to keep to a programme		1							1	2.70%	7

4.4.5 Qualitative findings

The respondents were asked to expand on the information provided through conducting semi-structured interviews with them. As shown in Table 4.15, the respondents prioritised the *price* provided by the contractor as the most significant criterion affecting the tender adjudication process. *Functionality* has also been indicated as important in tender adjudication. The participants furthermore stressed the *impact of corruption* in tender adjudication.

The results from the interviews show that there is a need for transparency in the tender adjudication process. Furthermore, the results from the quantitative analysis align with the findings derived from the qualitative analysis.

Table 4.15: Summary of qualitative findings

	Briefly explain why you think the alternative criteria you have provided could assist with selecting the most suitable service provider compared to the current criteria of the tender adjudication method.	**Please explain in what way these alternative items will improve the efficiency of the tender adjudication method.**	**What impact can the alternative percentages you provided have in the tender adjudication method to select a suitable service provider.**
PARTICIPANT A	I think price, functionality and B-BBEE status are paramount when considering appointing a good company and also it does not exclude anyone.	It is all inclusive of gender, ethnicity and age.	You will get well experienced companies with market related prices.
	Having the lowest price on the tender adjudication does not mean having previous experience and capacity in the company.	Price is very important as it plays a major factor in the selection of the awarded contractor. Adjustment has been done that both the price and functionality go hand in hand and [the] awarded contractor is not necessary the lowest but the most capable contractor to carry out the project.	Capacity in the company is not always given correctly or when awarded the contractor the person is no longer working for the company.
PARTICIPANT B	1. Tender pricing is generally realistic and within budget, so price is not the distinguishing factor as it was a few years ago. 2. Functionality is the hinge around which project success pivots. Criteria such as staff establishment, employment equity, access to financial and other resources and other tailor-made requirements that would reduce project risk can be set up as qualification. 3. With youth unemployment in the 60+ percentile and slow transformation of economy, a combination of these two factors would accelerate needed change through public procurement. Over-categorising of beneficiary groups have been proven to be ineffective and leads to corrupt and exploitative practices. Women and disabled are already part of youth and HDI categories.	It would reduce the number of permutations in adjudication and frustrate the fronting of beneficiary groupings by unqualified firms.	The 2 main metrics would establish whether bidders are serious contenders whilst the last metric would address our current economic empowerment needs.
	It's because it will allow disputing parties to resolve contract differences as quickly and efficiently as possible and allowing countless construction projects to continue.	Because it can assist to control over and who can choose an expect in [the] relevant field.	Profession: The service providers need to provide skilled and experts in the field.
	Functionality: The service provider has to be of the requirements and needs to perform accordingly.	Price: The pricing is very crucial as it needs to align with the contract amount, if not the project can never be successful.	
	I believe the youth needs to be involve[d] when it comes to tender selection as they are fresh from varsity and have great mind[s] to complete the project on time.	Construction time and [a] decreased unemployment rate.	Tendering should be a process not only encouraging but enabling businesses of all sizes to participate and be competitive.

	Goal driven and team players.	Considering qualified youth and skilful people.	The alternative percentages can assist with competitive price, fair allocation to capable service providers and assist emerging service providers get their fair share.
	It would be easier to track their past experience through references and it gives the client relief knowing that the service provider is used to handle similar jobs. And selecting a local service provider, it's easy for the client when they have a query to just go straight to their head offices.	It will improve in terms of disputes and delays.	Functionality is the first key phase, there service provider[s] shall meet such requirement[s] as provision leading [to] the assessment of phase 2 pricing and pricing procedures. Therefore, it is necessary for phase 1 percentage [to] be higher and followed by pricing assessment. Should the tenderer not meet the first phase the system will reject and provide [an] automated reason while tender application [is] rejected.
PARTICIPANT C	Maybe tender adjudication must be fair to all applicants by making sure that there is no favouritism in the process.	Reduce time and resources wasted by trying to adjudicate contractors who are not feasible to different scope of works.	Skills improvement is important and the young of today need to be kept busy with things that improve their skills.
	Current methods are not ineffective based on recent tender awards studied but can be improved.	Prioritise competence.	Being able to manage projects would make the project viable and easy for the client. Many project delays are a result of poor project management.
	Mandatory: Compliance is very important, providing required information proves you qualify to finish the project.	Companies will be more competent to carry out projects on time, budget and on good quality.	Allow people with disabilities to progress.
	It needs to focus more on youth.	Develop the youth.	
	Many contractors get tenders, yet they have no understanding of some of the construction processes at all, which leads to having small businesses seen as not competent enough. At least having the qualification as one of the requirements would make a huge difference as all contractors that are in construction would be of people with construction knowledge and background.		
	The price of production is important as the quality of production needs to be of a certain standard.		
	Experience with the similar tender[s] will easily help companies to be competent with new tenders.		

4.6 Discussion of quantitative Findings

4.6.1 Rationale for the Discussions

The efficiency of the various tender adjudication techniques used in South Africa's public construction project procurement is examined in this topic. Analysing the performance of various adjudication procedures in terms of regulatory compliance, risk management, quality of outcomes, cost-effectiveness, and time efficiency. In addition to giving a thorough overview of how tender adjudication might be streamlined to improve public procurement efficiency in South Africa's construction sector, the discussion offers insights into the advantages and disadvantages of each approach.

4.6.2 Perception of procurement stakeholders regarding the efficiency of the current tender adjudication method

The quantitative results revealed that the Supply Chain Management (SCM) team involved in tender adjudication do not have sufficient knowledge of the Preferential Procurement Policy Framework Act (PPPFA) used in the tender adjudication process to select a suitable contractor. Insufficient PPPFA knowledge is a notable factor that affects the efficiency of the current tender adjudication approach, with 67.8% of the respondents agreeing that it influences the tender adjudication process (MS=4.31). Khuzwayo (2020) supports this factor and confirms that insufficient PPFA knowledge of procurement stakeholders poses a challenge to preferential procurement targets.

In general, the PPPFA enables organs of the state to align with the interest of the people of the state or bidding contractors (Vinti, 2021). In addition, Hlakudi (2016) alludes that the purpose of the PPPFA is to redress inequalities by enabling HDIs to participate in the South African economy. Effective knowledge of the PPPFA enables fair procurement of construction projects in South Africa.

The respondents believed that the current tender adjudication method has loopholes that permit corrupt activities. This factor was ranked as the second most important element affecting the efficiency of the tender adjudication approach (MS=4.21), with 81.3% of the respondents agreeing that loopholes leading to corrupt activities has a serious impact on the tender adjudication process in South Africa. Furthermore, this factor shares a similar mean score (MS=4.21) with the statement that contractors selected under the current tender adjudication method do not possess adequate capabilities to complete the project (83% of the respondents agreed with this). According on Mahmood (2010), corruption has been a major problem in the government sphere of the construction industry across many developing countries. However, Bonsu et al. (2022) stress that a widespread public

procurement practice leads to minimising the impact of corruption and increases the transparency in public procurement.

The effectiveness of the tender adjudication method in selecting the most suitable service provider for a construction project ranked third in terms of mean score (MS=4.13). According to Public Procurement Act 2004, all tender adjudication must be done by the tender evaluation committee, and the committee must provide recommendations to the procurement management unit.

Furthermore, the respondents agreed that the tender adjudication method is not fair in terms of selecting of a suitable contractor for construction projects. This factor is ranked fourth, with overwhelming mean score of (MS=4.0). Notably, Huang (2011) believes that the current tender adjudication method of contractor selection has multiple criteria problems. In support, Chen et al. (2021) concur that the selection criteria adopted in the awarding of tenders lack transparency and fairness. In this study, 77.9% the respondents were of the view that the current tender adjudication method used under the PPPFA is biased in selecting a suitable service provider for construction projects (MS=3.73). Mnguni (2012) attributes bias in the tender adjudication process to procurement practices adopted in South Africa. This confirms the need for transparency in the tender adjudication process.

Despite the bias in the PPPFA, for tender adjudication to be effective in assisting with the selection of a suitable service provider, respondents agreed that the tender adjudication process is useful in the construction industry (MS=3.61). Kafile (2018) believes that the current tender evaluation process is significant in project execution, enabling the deliverables of a construction project and achieving stakeholders' project goals.

In summary, the respondents stressed that there is no transparency in the current tender adjudication method (MS=3.41). Highly dishonest or illegal behaviour hinders the procurement process, leading to a significant increase in challenges for contractor business and society. Lastly, the respondents opined that underperforming service providers can be attributed to an ineffective tender adjudication method. Nassar and Hegab (2009) note that contractors' performance is affected by the bid method adopted and results in project delivery problems, as contractors are faced with a shortage of work.

Component 1: The effectiveness of the tender adjudication process in selecting the most suitable service provider for a construction project influences the tender adjudication process

This principal factor explained the most variance and was defined by nine variables: the effectiveness of the tender adjudication process in selecting the most suitable service

provider for a construction project influences the tender adjudication process (0.792); many of the contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project (0.771); there is no transparency in the current tender adjudication process (0.728); the current tender adjudication process used under the Preferential Procurement Policy Framework Act is biased in selecting a suitable service provider for construction projects (0.717); the tender adjudication process is not fair in the selection of a suitable contractor for construction projects (0.685); the tender adjudication process is effective in assisting with the selection of a suitable service provider (0.684); the Preferential Procurement Policy Framework Act is an effective policy in the tender adjudication of selecting a suitable contractor for construction projects (0.654); the current tender adjudication process has loopholes that permit corrupt activities (0.596); and underperforming service providers can be attributed to an ineffective current tender adjudication process (0.540). Notably, each variable's appropriate factor loading has been contained in parenthesis. The effectiveness of the tender adjudication process in selecting the most suitable service provider for a construction project influences the tender adjudication process was the most significant variable. Liu, Wang and Wilkinson (2016) reveal that the success of the tender adjudication process in selecting the best service provider for a building project is critical and influenced by a variety of factors. According to Valentine et al. (2021), establishing clear and objective criteria ensures a fair examination, while the adjudication panel's competence and diversity aid in accurate assessments. Transparency and accountability boost trust in the process, which is backed by detailed bid paperwork from tenderers (Hochstetter et al., 2021).

Component 2: The tender adjudication process is effective in assisting with the selection of a suitable service provider

The second component includes three features, namely the tender adjudication process is effective in assisting with the selection of a suitable service provider, the tender adjudication process is not fair in the selection of a suitable contractor for construction projects, and the current tender adjudication process has loopholes that permit corrupt activities (Table 4.10). This component is capable of explaining 17.631% of the variance. the tender adjudication process is effective in assisting with the selection of a suitable service provider recorded the highest factor loading of (0.821) followed by the tender adjudication process is not fair in the selection of a suitable contractor for construction projects with a factor loading of (0.737) and the current tender adjudication process has loopholes that permit corrupt activities (0.598). These findings are consistence with the qualitative data.

4.6.3 Order of importance attached by procurement stakeholders to current tender adjudication criteria

Table 4.16 compares the importance attached by procurement stakeholders to the current order of importance as indicated in preferential point system.

Table 4.86: Importance attached by respondents to tender adjudication criteria vs. current order of importance

Order of importance by respondents					Current order of importance	Rank
Criteria	**No.**	**MS**	**Std.**	**Rank**	**Percentage%**	**006C? x**
Price	37	4.02	0.846	1	60%	1
Points for HDI status/BEE/B-BBEE	37	3.97	0.762	2	4%	3
Points for youth	37	3.89	0.826	3	2%	5
Functionality	37	3.84	0.804	4	30%	2
Points for disability	37	3.78	0.867	5	1%	6
Points for gender equity	37	3.58	0.704	6	3%	4
Composite score average		**3.85**			**100**	

Among the order of importance in tender adjudication, *price* is one of the important criteria that is considered. The quantitative findings indicate that the price of the bid is very significant, with 84.8% of the respondents agreeing that price plays an important role in tender selection (MS=4.02). This is corroborated by Bajari et al. (2014), who maintain that the evaluation of economic bids solely depends on project cost, including market related prices which characterize the economic bid. In addition, price remains the important variable in the construction industry because it serves as the main regulator of the industry, and as such, it allocates the factors for production (Kissi et al., 2017). Furthermore, the pricing strategies are affected by the objectives of the contractor and what the contractor hopes to achieve in return with the price tag placed on the project (Kissi et al., 2017).

Points for HDI status/BEE/B-BBEE is the second most significant criterion in the tender adjudication process from the respondents' perspective, with a mean score of (MS=3.97). This is in line with Taylor and Raga (2010), who indicate that B-BBEE enables access for communities and black woman to economic activities, infrastructure, and skills development. Moreover, B-BBEE is also designed to spread the economic benefits to a broad base of historically disadvantaged individuals (Kalula & M'Paradzi, 2008).

Points for youth ranked third in terms of order of importance assigned by the participants to the tender adjudication criteria (MS=3.89) and was a notably important attachment in the tender adjudication process. This finding is consistent with the normative literature. For

instance, Fatoki and Chindoga (2011) point out that the low entrepreneurial activity among youth is the primary reason for the low entrepreneurial activity in South Africa and the inclusion of points for youth in tender adjudication addresses the low entrepreneurial rate.

In Table 4.16, which has been extracted from Table 4.7, it is noted that the tender *price* remains significant in the tender adjudication process, still ranked first still ranked first as one of the most effective criteria in tender adjudication in public sector procurement. The current tender adjudication process allocates 60% of the tender award to tender price. As indicated in Table 4.8, most of the respondents agreed that price is important in the tender adjudication process, with more than 84.8% of the respondents in favour of this factor. This proves the significance of effective and precise cost estimation adopted by the contractor.

Table 4.16 furthermore indicates that *points for HDI status/BEE/B-BBEE* is an important criterion in awarding a tender, with 84.8% of the respondents in favour of this factor (ranked second). However, the importance of this criterion (from the respondents' perspective) differs from the current important tender adjudication criteria; the current importance of tender adjudication notes contractors' *functionality* as significant (ranked second) (30%). Notably, the current tender adjudication process ranks *points for HDI status/BEE/B-BBEE* third with (4%) allocated in this factor. On the other hand, 88.1% of the respondents ranked *points for youth* as third in terms of order of importance.

It was observed that the current importance of the *gender equity*, *points for youth*, and *points for disability* criteria are ranked fourth, fifth, and sixth, respectively, with 3%, 2%, and 1% of tender award allocated to these criteria, respectively. However, the respondents ranked *functionality* as fourth, the current importance of criteria indicates that *functionality*, *points for disability* as fifth, and *points for gender equity* as sixth.

4.6.4 Re-allocation of percentage weightings of current tender adjudication criteria

The respondents were asked to re-allocate the weightings of the tender adjudication criteria to reflect their views of the order of importance of these criteria. These percentages are shown in Table 4.17.

Table 4.13: Re-allocation of percentage weighting of current tender adjudication criteria

Re-allocated % weightings					**Current allocated % weightings of criteria**	
Criteria	**No.**	**MS**	**Weight %**	**Rank**	**Weight %**	**Rank**
Functionality	37	4.37	46%	1	30%	2
Price	37	4.19	45%	2	60%	1

Points for youth	37	3.98	5%	3	2%	5
Points for disability	37	3.82	2%	4	1%	6
Points for gender equity	37	3.78	1%	5	3%	4
Points for HDI status/BEE/B-BBEE	37	3.71	1%	6	4%	3
Total		**3.98**	**100**			

As indicated in Table 4.17, the quantitative findings reveal that *functionality* was ranked first with an overwhelming 46% of the respondents. This finding is supported by Zhu et al. (2021), who note that there would be no point to commence the construction project if the contractor does not function, as the functionality of the firm is closely related to the performance. The quantitative results also reveal *price* as the second notable re-calculated weighting, with 45% of the respondents supporting the significance of pricing in tender adjudication. Thus, the findings related to pricing is consistent with the normative literature. *Points for youth* is the third most ranked re-allocated weighting with 5% of the respondents in support of this approach. It should be noted that the results for the re-allocated percentage weighting is in line with the importance of the order of attachments in the tender adjudication process.

Table 4.17 shows the proposed re-allocation percentages of tender adjudication compared to the current tender adjudication percentages of the tender awarding process in respect to price, functionality, points for youth, points for disability, points for gender equity, and points for HDI status/BEE/B-BBEE. The findings show that the proposed re-allocation weighting for contractors' *functionality* is significant (46%), ranked first. This is compared to the current tender awarding process in favour of *price* (60%), ranked first. The proposed tender adjudication re-allocation is in favour of the tender *price*, with 45% of the respondents in agreement of this factor ranked second. It was found that the current tender adjudication process ranked *functionality* second with 30% allocated to contractors' functionality. It was observed from this study that there is a need to recognise the importance of contractors' *functionality* in the tender adjudication process together with *price*.

The proposed re-allocation points for *youth* is ranked third with (5%) allocated to this criterion, whilst the current tender adjudication's *points for HDI status/BEE/B-BBEE* is ranked third with 4% allocated to this criterion.

From Table 4.17, it was furthermore observed that *points for disability*, *points for gender equity*, and *Points for HDI status/BEE/B-BBEE* ranked fourth, fifth and sixth, with (2%), (1%) and (1%), respectively. On the other hand, the current tender adjudication process ranks *points for gender equity*, *points for youth*, and *points for disability* ranked fourth, fifth and sixth, with (3%), (2%) and (1%) respectively.

4.7 Discussion of qualitative interviews

The interview's goal was to verify the quantitative information gathered from national government spheres. For the interviews conducted, the quantity surveyor is referred to as ***Participant A*** in this study, the project manager is referred to as ***Participant B,*** and the directors as ***Participant C***. The interview session with each participant commenced with an explanation of the study's overall goal and the title of the research. The semi-structured data gathering tool with the interview questions were developed in line with quantitative questionnaires. To capture all the participants' opinions, a recording device was used during every interview based on the interviewees' permission during the interview proceedings.

4.7.1 Interview with Participant A

4.7.1.1 Background information

The first interview took place with the quantity surveyor from the Department of Publics works on the 19th of October 2022 at 10:30 in the offices of DPW in the Cape Town area. The interviewer read each question from the copy to the participant. The interview lasted roughly 40 minutes. The participant earned a BTech degree in quantity surveying and had 25 years' experience in the industry, with 15 years in the tender adjudication. The participant's focus is on building construction tender adjudication projects.

4.7.1.2 Summary of findings

i) Alternative criteria compared to current adjudication criteria to assist with selecting the most suitable service provider

The findings reveal that *Participant A* stated the tender price as the most significant element of the tender adjudication process towards enhancing an effective procurement process in South Africa. *Participant A* mentioned:

> "I think price, functionality and B-BBEE status are paramount when considering appointing a good company and also it does not exclude anyone".

Furthermore, *Participant A* noted that although some contractors tend to lower their price in an effort to secure construction projects without the sufficient capacity and experience,

> "having the lowest price on the tender adjudication doesn't mean [the tenderer] have the previous experience and capacity in the company".

The contractors' tender amount and budgeting form the fundamentals of the sustainability of construction and infrastructure development in South Africa (Musarat et al., 2020).

According to Skitmore and Smyth (2007), pricing theories and literature attempt to explain basic economic forces in any industry.

Effective pricing appears to influence tender adjudication. It is observed from this study that the contractors' estimate is rated high, enabling them to be competitive and have the advantage of securing construction projects from government spheres of the Western Cape. This study notes that contractors' experience is significant in the tender adjudication process of the Western Cape. This is in line with Aljohani et al. (2017), who posit that contractors' project experience has the potential to default in construction project delivery, resulting in project cost overrun or project failure, hence, the tender adjudication team pays close attention to contractors' experience in terms of project delivery. In general, the client is tracking the contractors' previous projects that have been completed to select the correct contractor to undertake the project (Qiang, 2015). Contractors' capacity in terms of resources influences the tender adjudication process, because, as noted by Akali and Sakaja (2018), contractors' capacity enables effective planning, sourcing, and controlling of construction projects.

ii) In what way will these alternative criteria improve the efficiency of the tender adjudication method?

According to the findings, *Participant A* stated ethnicity in the tender adjudication process as significant towards balancing equality in the construction industry. *Participant A* said: *"It is all inclusive of gender, ethnicity and age".* The participant argued that there is a need to promote youth in tender adjudication as a tool to address the impact of the unemployment rate in communities. This response is supported by Oluwajodu et al. (2015), who note that the ethnicity and/or youth in South Africa is currently experiencing a high unemployment compared to older members of society around the world.

Participant A further pointed out that,

> "price is very important as it plays a major factor in the selection of the awarded contractor. Adjustment has been done that both the price and functionality go hand in hand and [the] awarded contractor is not necessary the lowest but the most capable contractor to carry the project out."

This emphasises the significance of the contractor ensuring an effective tender estimate to be more competitive in the tender adjudication process. Therefore, the efficiency of the tender adjudication method in South Africa can be improved through the adoption of ethnical equality and the tender price submitted by the contractor.

iii) Impact of alternative percentages on the tender adjudication method to select a suitable service provider

Participant A was asked to indicate criteria that could be improved/re-allocation towards enhancing the efficiency of the tender adjudication process in South Africa. *Participant A* noted that "you will get well experienced companies with market related prices". Kissi et al. (2017) argue that the external factors and market condition influence the tender adjudication process, and this depends on the current market conditions at the time. *Participant A's* responses aligned with the quantitative results of this study, agreeing that pricing is the most significant criterion affecting the tender adjudication process. Furthermore, *Participant A* pointed out that,

> "capacity in the company is not always given correctly or when awarded, the contractor the person, is no longer working for the company".

Watt et al. (2009) presented selection criteria that assess the competency of a supplier in terms of its organisational structure, management skills, banking arrangements, cash flow, management qualifications, and performance history (Watt et al., 2009).

4.7.2 Interview with Participant B

4.7.2.1 Background information

The interview was conducted with the project manager (*Participant B*) on 28 October 2022 at 09:00 am at the Department of Human Settlements in Cape Town, in the office. The interview session lasted about 30 minutes, and the interviewer ensured that the participant respond to each question posed during the interview. It was a good practice that the interviewer read each question from the copy shared with the participant. *Participant B* has a Master's degree in construction management and more than 10 years' experience in the adjudication process. At the time of the data collection for this study, the participant was directly involved in the tender adjudication process, including national government construction projects, to enhance effective knowledge in the building industry.

4.7.2.2 Summary of findings

i) Alternative criteria compared to current adjudication criteria to assist with selecting the most suitable service provider

Participant B stated that budgeting from the government sphere affects the tender adjudication project and compromises the quality of the tender awarding process in South Africa, because the tender adjudication team is compelled to keep to a limited budget issued by the government. *Participant B* quoted that,

> "tender pricing is generally realistic and within budget, so price was not the distinguishing factor a few years ago".

According to Agbenyo et al. (2018), budgeting is a plan for achieving objectives and goals within a specified time frame, estimating the resources needed, comparing them to the resources available from previous periods, and forecasting future requirements. This enables the adjudication team to effectively plan for each specific project. Additionally, *Participant B* noted that,

> "the functionality is the hinge around which project success pivots. Criterion such as staff establishment, employment equity, access to financial and other resources and other tailor-made requirements that would reduce project risk can be set up as qualification".

These criteria are significant for ensuring that the contractor meets the requirements of the tender awarding process in the Western Cape government.

In this study, it was found that contractors' functionality influences the adjudication process. The contractor's functionality is significant to procurement stakeholders, as it enables the team to identify the capabilities of the contractor to undertake the construction project (Spaulding et al., 2005). Contractors' functionality influences the performance of the management team of the contractor in achieving better results for the organisation within the agreed framework, performance, planned goals and competencies (Omran et al., 2012). Furthermore, *Participant B* suggested that,

> "with youth unemployment in the 60+ percentile and slow transformation of economy, a combination of these two factors would accelerate needed change through public procurement. Over categorising of beneficiary groups have been proven to be ineffective and leads to corrupt and exploitative practices. Women and disabled are already part of youth and HDI categories".

This notes the national call for transformation development in South to benefit those who were not able to benefit before 1994. Dainty et al. (2004) uncovered a significant need for urgent attention to balance and social representation of work sharing in South Africa.

ii) In what way will these alternative criteria improve the efficiency of the tender adjudication method?

From the interviews it was found that project duration reduces the impact of unemployment, and this should be taken into consideration by the tender adjudication team. *Participant B*

quoted, “construction time and decrease[d] unemployment rate”, thereby noting that the length of construction project impacts positively on the unemployment rate. On the other hand, in alignment with *Participant A, Participant B* stated:

> “Price: the pricing is very crucial as it needs to align with the contract amount, if not the project can never be successful”.

According to Agbenyo et al. (2018), construction stakeholders need to pay more attention to setting up a realistic construction project duration to enhance the contractor’s performance and meeting clients’ goals. Thus, a precise estimate of the duration of a construction project will positively influence the delivery of the project and enhance the sustainability of infrastructure development of South Africa.

iii) Impact of alternative percentages on the tender adjudication method to select a suitable service provider

Participant B was asked to comment on an alternative tender adjudication process that can be adopted by the adjudication team. *Participant B* confirmed the following:

> “Profession: The service providers need to provide skilled [workers] and experts in the field”.

It was stressed by Ponting and Haerty (2022) that the skills possessed by the contractor and professionalism enable the contractor to pay attention to essential tender requirements, which could proof to be a challenge in terms of the tender adjudication process. It is noted from these findings that the contractor needs to ensure they have qualified staff in their management team to enable continuous project procurement in South Africa.

4.7.3 Interview with Participant C

4.7.3.1 Background information

In this study, the third interview was conducted with the supply chain director in local government in the Western Cape, who managed all procurement systems. The interview took place on the 11th of November 2022 in Cape Town at 12pm. This interview lasted for about 45 minutes, and the interviewer read each question to ensure clarity of the questions and the study. The director confirmed more than 25 years of experience in the building industry, more than five years working for the local government, and occupying the director position for more than four years. The participant obtained a BTech in Construction Management and has been a registered project manager at SACPCMP since 2011.

4.7.3.2 Summary of findings

i) Alternative criteria compared to current adjudication criteria to assist with selecting the most suitable service provider

Participant C indicated that government stakeholders need to exercise fairness in their tender adjudication process to enhance the efficiency of the tender adjudication process in the government sphere. The participant was quoted saying,

> "maybe tender adjudication must be fair to all applicants by making sure that there is no favouritism in the process".

This confirms the need for transparency in tender adjudication to achieve fairness. Literature indicates that the procurement of goods and services should adopt fair mechanism and rules to ensure the effective use of public resources (Herman & Yohannis, 2018). In addition, Komakech (2016) points out that an effective public procurement system should ensure fairness among all participants by providing equal opportunities for competition and eliminating any form of discrimination against potential bidders. *Participant C* further indicated that there is a lack of understanding among the contractors regarding tendering process. The participant said the following:

> "Many contractors get tenders, yet they have no understanding of some of the construction processes at all, which leads to having small business seen as are not competent enough".

Thus, the participant stressed that formal education and training is important in the construction industry to enhance management skills. Technical and Vocational Education and Training (TVET) has a long history of offering a high return on investment because of its long history of fulfilling human security (Yangben & Seniwoliba, 2014). Furthermore, *Participant C* called for collaboration between well-established contractors and emerging contractors to improve tender competition among contractors. Bemelmans et al. (2012) uncovered that there is a need for effective networking in the construction industry to enhance healthy market competition.

ii) Impact of alternative percentages on the tender adjudication method to select a suitable service provider

Participant C noted that there is a need to focus on contractors' management competencies to enhance the efficient of the tender adjudication process. The participant was quoted saying "prioritise competence". This is in line with *Participant A* who stressed that contractors' competencies is important in tender awarding to select a suitable contactor. The

literature revealed that contractors' competencies include a set of behaviour patterns that enables the contractor to perform activities and functions effectively (Xu et al., 2014). The participant added that there is a need to adopt points for youth in the tender adjudication process, which is similar to *Participant B's* response.

iii) Impact can the alternative percentages

Participant C was of the view that there is a need for the adoption of skills improvement, and the youth of today need to be kept busy with 'things' that improve their skills. It should be noted that in the construction industry, there is need for education and training to enhance staff knowledge. Thus, skills improvement does not only apply to contractors, but also to the adjudication team reviewing the tender document to ensure fairness and transparency in the tender process. To foster fair tender adjudication, Ambe (2016) reveals that the supply chain team need to possess the required knowledge and skill in their respective fields. Furthermore, *Participant C* noted that the contractor should consider the youth and women's development in tender adjudication. In support, Andrade et al. (2022) note that gender over the years has been an organisational barrier to the implementation of the equality policy.

4.8 Chapter Summary

An analysis of the collected data was presented in this chapter, along with the findings derived from the available data. The quantitative data were analysed through descriptive statistics using SPSS Software (version 25) and Factor analysis. To determine the perceptions of procurement stakeholders in South Africa regarding the current tender adjudication process, results were ranked hierarchically using the mean score. The qualitative data obtained from interviews with the contractors were also presented. Based on the perception of the respondents, it was found that the SCM team involved in the tender adjudication do not have sufficient knowledge of the Preferential Procurement Policy Framework Act used in the adjudication method to select a suitable contractor. Furthermore, the current tender adjudication method has loopholes that permit corrupt activities, and many of the contractors selected under the current tender adjudication method do not possess adequate capabilities to complete the project. It was furthermore found that price, points for HDI status/BEE/B-BBEE, and points for youth are important criteria that should be included by contractors to secure projects; however, all the criteria were noted as significant. In the re-allocation process, the respondents noted that functionality, price, and points for youth are significant in the tender adjudication process. With regard to an alternative tender adjudication process, price, functionality, and gender were recognised by the respondents as the most significant criteria for tender adjudication. The findings of this study were ranked hierarchically using the mean score (MS) to obtain the perception of the efficiency of tender

adjudication methods in the public procurement of construction projects in South Africa. It was found that the supply chain management team involved in tender adjudication do not have sufficient knowledge of the Preferential Procurement Policy Framework Act (PPPFA). The findings furthermore reveal the price of the bid as very significant for tender adjudication process. In addition, that the current tender adjudication process is confronted by numerous loopholes that permit corrupt activities, which subsequently enable inadequate tender adjudication. The weightings of the current criteria used in the tender adjudication process were presented, as well as re-allocated percentage weightings for tender adjudication criteria from the perspective of the respondents. Furthermore, an alternative innovative method for public procurement was proposed and presented. The qualitative results are consistent with the quantitative results. A comparison of the order of the adjudication criteria (weightings) revealed that price and functionality remain very important criteria, followed by points for youth.

CHAPTER 5: CONCLUSIONS, RECOMMENDATIONS, LIMITATIONS AND FURTHER RESEARCH AREA

5.1 Instruction

This chapter presents the conclusions of the research, highlights the limitations, makes recommendations on how to address the problem, and states areas for future research in terms of appraising the efficiency of tender adjudication methods in the public procurement of construction projects in South Africa. The study aimed to investigate the efficiency of the tender adjudication process using the preferential point system to select a suitable contractor. To achieve the aim, following objectives were formulated:

O1: To evaluate the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method.

O2: To establish the order of importance assigned to the tender adjudication criteria by the procurement stakeholders.

O3: To ascertain whether an alternative method can improve the efficiency of the tender adjudication method.

Taken into consideration each of the formulated objectives, a mixed methods research approach was adopted, aided by i) administering questionnaire surveys to gather quantitative data from selected procurement stakeholders in the Western Cape, ii) and conducting interviews to gather qualitative data from tender adjudication stakeholders in the Western Cape.

5.2 Summary of the study findings

5.2.1 Perception of procurement stakeholders regarding the efficiency of the current tender adjudication method

Determining the perception of selected procurement stakeholders was one of the approaches used to investigate the current tender adjudication process in the Western Cape Province of South Africa. To achieve significant results for this objective, a review of existing literature was conducted, and survey questionnaires were administered to procurement stakeholders in the Western Cape Province. The findings reveal the following with respect to the perception of procurement stakeholders regarding the *efficiency* of the current tender adjudication method, in hierarchical order: i) tender adjudication to select a suitable contractor is done without sufficient knowledge of the Preferential Procurement Policy Framework Act (PPPFA) (MS=4.31); ii) the tender adjudication method has loopholes that

permit corrupt activities to filter through (MS=4.21); and iii) the effectiveness of the tender adjudication method in selecting the most suitable service provider for a construction project ranked third in order of importance (with MS=4.21).

In summary, the findings of this study reveal that the procurement tender adjudication process is affected by inadequate knowledge of the adjudication team regarding PPPFA as well as the impact of corruption in the construction industry. Nonetheless, some respondents expressed that the tender adjudication method can improve if applied effectively.

5.2.2 Order of importance attached by procurement stakeholders to current tender adjudication criteria

One of the objectives of this study was to establish the order of importance assigned to the current tender adjudication criteria by the procurement stakeholders. Among the important criteria used in the adjudication process is the price of the bid, with a mean score of (MS=4.02). The findings show that the participants believed the bid price is significant because it enables the client to effectively budget for the project. The points for HDI status/BEE/B-BBEE and points for youth were the second and third most important criteria.

The findings from this study reveal the order of importance of the current tender adjudication criteria compared to the order of importance proposed by the respondents. The current weightings of the tender adjudication process in order of importance and rank (from first to sixth) are price, points for HDI status/BEE/B-BBEE, points for youth, functionality, points for disability, and points for gender equity. The need for improvement of the order of importance of the tender adjudication criteria are clear from the re-allocation of the participants weightings, which are as follows (ranked from first to sixth): price, functionality, points for HDI status/BEE/B-BBEE, points for gender equity, points for youth and points for disability.

In conclusion, the findings from this research revealed that procurement policy requires effective pricing, B-BBEE, and youth development in the construction industry to empower the South African economy.

5.2.3 Re-allocation of percentage weightings of current tender adjudication criteria

The literature related to the re-allocation of weighting was reviewed to gain insight into the re-allocation of current tender adjudication. The re-allocation of the weighting of the current tender adjudication criteria was done by the procurement team who took part in the study.

The findings reveal that 46% of the respondents pointed to functionality as the most important criterion, with pricing second (45%), followed by points for youth. It should be noted that objective 3 confirms the results of objective 2. Furthermore, the respondents were asked to propose a re-allocation for percentage weighting of the current tender adjudication criteria. It was observed from the findings that the re-allocation of the current tender adjudication process ranked the criteria as follows: contractors' functionality (46%), price (45%), points for youth (5%), points for disability (2%), points for gender equity (1%), and points for HDI status/BEE/B-BBEE (1%). This was done in comparison with the current tender adjudication criteria, which are ranked as follows: contractors' price (60%), contractors' functionality (30%), points for HDI status/BEE/B-BBEE (4%), points for gender equity (3%), points for youth (2%), and points for disability (1%).

5.2.4 Alternative method for public procurement

Based on the quantitative findings, alternative innovative methods for public procurement should include pricing, functionality, and gender equality. The quantitative results were supported by the qualitative findings regarding the alternative methods that could be adopted in the tender adjudication process. In addition, the qualitative results revealed that the procurement stakeholders were concerned about the lack of knowledge and formal education and training of public sector employees. Therefore, the tender adjudication process needs to recognise contractor functionality as a significant criterion to ensure successful project delivery. Furthermore, there is a need to pay attention to points for youth as an important criterion to ensure that public projects limit the unemployment rate in the South African nation.

5.3 Conclusions

Participants' credentials and experience influence the efficiency of tender adjudication processes in South Africa's public construction project procurement. Each adjudication method has advantages and disadvantages, and their performance varies according to the context and needs of individual projects. The cumulative expertise and experience of all parties, together with strong regulatory support, is critical for optimising tender adjudication procedures, maintaining transparency, and producing high-quality project outputs.

5.4 Recommendations

This study focuses on the perception of procurement stakeholders regarding the efficiency of the current tender adjudication method, the order of importance attached by the procurement stakeholders to the current tender adjudication criteria, the re-allocation of the

percentage weightings of the current tender adjudication items, and an alternative innovative method in public procurement to enhance the efficiency of the current tender adjudication process. Based on the quantitative findings, the recommendations are as follows:

- Tender adjudication stakeholders should note that for the current tender adjudication method, the tender adjudication team do not have sufficient knowledge of the Preferential Procurement Policy Framework Act (PPPFA) as the tenders are sometimes awarded to incorrect contractors.
- Tender adjudication team should be aware that the current tender adjudication process has loopholes that permit corrupt activities, and this permits inadequate tender awarding practices.
- Public stakeholders should be aware that government funding is invested in contractors when awarding tenders, therefore the effectiveness of the current tender adjudication process needs to be revisited.
- During the tender adjudication process, the adjudication stakeholders should pay more attention to contractors' bid price.
- To enhance the realignment of the construction industry, tender stakeholders should consider the impact of B-BBEE to ensure that tenders are distributed and awarded to suitable contractors.
- The adjudication team need to concentrate on the *points for youth* in tender adjudication to ensure that economic development is maintained in the country.
- The adjudication team need to focus on a contractor's *functionality* to ensure that the tender is awarded to the contractor that can deliver the project. The functionality of the contractor assures the return on clients' investment in terms of project delivery.
- The construction industry should embark on balancing *gender equality*.
- The tender adjudication team need to be more knowledgeable and trained in terms of project delivery.

5.5 Recommended Framework for the effectiveness of the tender adjudication process

Figure 5.1 shows the proposed framework for enhancing the effectiveness of the current tender adjudication. The tender adjudication team believes that it is most significant that the tender adjudication team possesses sufficient knowledge regarding PPFA. In the tender selection, the selection team needs to check the capabilities of the contractor to undertake the construction project. The tender adjudication team indicated that the priority in tender adjudication is the tender price which significantly affects the awarding of the construction

project. Figure 5.1 shows that given the opportunity to reallocate the current point system used in South Africa, the tender adjudication team believes that the functionality of the contractor should be the priority to ensure the effective use of limited public resources. This proves that by only focusing on contractors' tender price state resources may be misunderstood therefore contractors' functionality plays a significant role. Although prices is regarded as important, gender and HDIs have to be considered in the relocation or alternative procurement method.

Figure 5.1: Recommended Framework for effeteness of the current tender adjudication process

5.6 Limitations and further research

5.6.1 Limitations

The study was conducted in the Western Cape Province of South Africa, delineated to the Department of Public Works, the Department of Transport, the Department of Human Settlements, and local government. Furthermore, the management teams of the tender adjudication process were always busy, which made data collection challenging task. Consequently, some respondents were not able to complete the questionnaires properly due to time constraints, leading to the researcher discarding the questionnaires. As a result of budgetary and time constraints, not all provinces in South Africa were surveyed.

5.6.2 Further research

This study assessed the effectiveness and challenges of the tender adjudication process. Based on current literature, it appears that many tender adjudicators lack knowledge on how to properly evaluate contractor bids, which can result in undeserving or incompetent contractors being awarded tenders. To ensure fairness in the construction industry, further research is needed to explore the re-allocation process of the PPPFA point system used in tender adjudication. Additionally, government departments should provide continuous training to their staff to improve their understanding of tender adjudication. This study was limited to the Western Cape and only gathered the opinions of respondents who serve on tender adjudication committees. It would be beneficial to conduct a thorough investigation of procurement strategies applied across various South African provinces. This study should also include an analysis of strategies employed in other countries that face similar challenges. By doing so, we can develop a new model for the tender adjudication process in South Africa that will provide contractors and consultants with an opportunity to share their opinions and insights.

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ANNEXURE A: QUESTIONNAIRE FOR THE STUDY

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APPRAISAL OF THE EFFICIENCY OF TENDER ADJUDICATION METHODS IN PUBLIC PROCUREMENT OF CONSTRUCTION PROJECTS IN SOUTH AFRICA

Dear Madam / Sir

Re: Appraisal of the Efficiency of Tender Adjudication Methods in Public Procurement of Construction Projects in South Africa

This survey is part of a research project aimed at meeting the requirements for a master's degree in Construction Management at Cape Peninsula University of Technology.

The aim of this phase of the research process is to **examine the efficiency of tender adjudication methods in public procurement of construction projects in South Africa**

The questionnaire should **not take more than 15 to 20 minutes** to complete, and we would be grateful if you would endeavour to complete the questionnaire and return it on or before **15March-2022** to: **Attention:** Ms Damba per e-mail to: dambab@cput.ac.za.

Should you have any queries please do not hesitate to contact Ms B. Damba at 0717604035 or per e-mail: dambab@cput.ac.za.

Please note that your anonymity is assured i.e., your individual response will not become public knowledge.

Thanking you in anticipation of your response.

Ms Babalwa Damba

Qualification (Construction Management) Candidate Dr X Nghona

SECTION A: BIOGRAPHICAL INFORMATION OF RESPONDENTS

PLEASE, cross or tick as appropriate (X or √) to indicate your opinion.

1. **Kindly indicate your current position in your organisation:**

☐Regional Manager ☐Director EPWP ☐Director Property ☐Director Projects ☐Director Prestige ☐Quantity Surveyor ☐Architect

☐Director Supply Chain Management ☐ Deputy Director User Demand Management

☐ Deputy Director Facilities Management ☐ Professional Project Manager ☐Chief Works Manager

☐Chief Construction Project ☐Manager Chief Works Manager

Other……

2. **How long have you been working in this position?**

1-5 Years	6-10 Years	11-15 Years	16-20 Years	21-25 Years	Above 25 Years

3. **Kindly indicate your participation experience in tender awarding of a construction project(s) in a year?**

0 Project	1-5 projects	6-10 projects	11- 15 projects	16 projects and above

4. **Please indicate your highest formal qualification obtained:**

Matric certificate	Diploma	Bachelor / Honours degree	Masters' degree	Doctorate degree	Others (specify)

SECTION B: PERCEPTION OF THE PROCUREMENT STAKEHOLDERS REGARDING THE EFFICIENCY OF THE CURRENT TENDER ADJUDICATION METHOD

The following are factors that facilitate the efficiency of the current tender adjudication method.

Kindly use the scale below to rate the statements as appropriate.

Note: **Strongly disagree (SD) =1, Disagree (D) =2, Neutral (N) = 3, Agree (A) =4, Strongly agree (SA) = 5**

Statements	**SD**	**D**	N	**A**	**SA**
The effectiveness of the tender adjudication process to select the most suitable service provider for a construction project influences the tender adjudication process.	1	2	3	4	5
The tender adjudication process is effective in assisting with the selection of a suitable service provider.	1	2	3	4	5
Many of the contractors selected under the current tender adjudication process do not possess adequate capabilities to complete the project.	1	2	3	4	5
Underperforming service providers can be attributed to an ineffective current tender adjudication process.	1	2	3	4	5
The Preferential Procurement Policy Framework Act is an effective policy in the tender adjudication process to select a suitable contractor for construction projects.	1	2	3	4	5
The tender adjudication process is not fair in terms of the selection of a suitable contractor for construction projects.	1	2	3	4	5
The Supply Chain Management team involved in the tender adjudication do not have sufficient knowledge of the Preferential Procurement Policy Framework Act used in the adjudication process to select a suitable contractor.	1	2	3	4	5
The current tender adjudication process used under the Preferential Procurement Policy Framework Act is biased in terms of selecting a suitable service provider for construction projects.	1	2	3	4	5
There is no transparency in the current tender adjudication process.	1	2	3	4	5
The current tender adjudication process has loopholes that permit corrupt activities.	1	2	3	4	5

SECTION C: ORDER OF IMPORTANCE ATTACHED BY THE PROCUREMENT STAKEHOLDERS TO THE CURENT TENDER ADJUDICATION CRITERIA

Kindly rate the usefulness of each criterion helping to select the most suitable service provider for the contract.

No	Criteria	Very much useful	Useful	Not sure	Useless	Very much useless
1.	Price					
2.	Functionality					
3.	Points for HDI status/ BEE/B-BBEE					
4.	Points for gender equity					
5.	Points for youth					
6.	Points for disability					

If you were to re-allocate the percentage weightings of the current tender adjudication criteria, what percentages would you allocate? The allocation should total 100%.

No	Criteria	Weight in percentages
1.	Price	
2.	Functionality	
3.	Points for HDI status/BEE/B-BBEE	
4.	Points for gender equity	
5.	Points for youth	
6.	Points for disability	

SECTION D: AN ALTERNATIVE METHOD TO IMPROVE THE EFFICIENCY OF THE TENDER ADJUDICATION PROCESS

If you were to create the template for tender adjudication, list any 3-5 alternative criteria/factors of your choice with percentage weightings that you think should be included to select the most suitable service provider for the construction projects?

No	Alternative Criteria/Factors	Alternative weighting in percentages (%)
1.		
2.		
3.		
4.		
5.		

SECTION E: AN ALTERNATIVE TENDER ADJUDICATION METHOD BASED ON THE VIEWS OF PARTICIPANTS

The following are based on the information provided in section D above:

1. Briefly explain why you think the alternative criteria you have provided could assist with selecting the most suitable service provider compared to the current criteria of the tender adjudication process.

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   ……
   ……
   ……
   ……

2. Please explain in what way these alternative criteria will improve the efficiency of the tender adjudication process.

   ……
   ……
   ……
   ……
   ……

3. What impact can the alternative percentages you provided have in the tender adjudication process to select a suitable service provider?

   ……
   ……
   ……
   ……
   ……

4. Do you have any comments in general regarding the **efficiency of the tender adjudication process in the public procurement of construction projects in South Africa**?

……
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……
……
……

Thank you for your kind cooperation.

ANNEXURE B: EDITING CERTIFICATE

14 November 2023

BABALWA DAMBA
Faculty of Engineering and the Built Environment
Cape Peninsula University of Technology
Belville, South Africa

CERTIFICATE - EDITING OF MASTER'S THESIS

I, the undersigned, herewith confirm that the editing of the Master's thesis of **Babalwa Damba**, titled *"APPRAISAL OF THE EFFICIENCY OF TENDER ADJUDICATION METHODS IN PUBLIC PROCUREMENT OF CONSTRUCTION PROJECTS IN SOUTH AFRICA"* has been conducted and concluded.

The finalised thesis was submitted to Dr Xolani Nghona on 14 November 2023.

Sincerely

Professor Annelie Jordaan
DTech: Information Technology
Ph: 065 990 3713

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SATI
South African Translators Institute