MOSHI CO-OPERATIVE UNIVERSITY

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BY

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DECLARATION AND COPYRIGHT

I, **Mugisha Funuguru**, declare that this research is my original work and that it has not been presented and will not be presented to any other higher learning institution for a similar or any other academic award. The papers in this research originate from my own study and it summarises my own effort.

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Moshi Co-operative University Research titled **"The Determinants for bidders' participation in public procurement through the electronic government procurement system procurement: a case study of Moshi Municipality"** in fulfilment of the requirements for award of the Degree of Master of Arts in Procurement and Supply Management of Moshi Co-operative University (MoCU).

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DEDICATION

For my family, whose love and prayers towards me have never faded, their presence made my life meaningful and worth fighting for.

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To achieve this academic milestone, many sacrifices, infinity of support and painful commitment had to be collaborated. I would like first to acknowledge God the Almighty, of him I had the strength and health to undertake this study. I also thank my supervisors' Dr.F. Panga and Dr W.B Warsanga, for his guidance and constructive criticism that resulted in this substantial work. I thank all the lecturers at Moshi Cooperative University who taught me while undertaking this master's degree. My special appreciation goes to all retial Shops owners in Moshi Municipality who participated in this study my family heroes Mr. and Mrs.Funuguru, without their motivation, I would not have completed this research.

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LIST OF ABBREVIATIONS

B2B	:	Business to Business
BI	:	Behaviour Intention.
CFS	:	Container Freight Station
DOI	:	The diffusion of innovations
E-COMMERCE	:	Electronic commerce
E-PROCUREMENT	:	Electronic procurement
EPS	:	Electronic Procurement System
E-REDINESS	:	Electronic readiness
GPSA	:	Government Procurement Service Agency
ICTs	:	Information and Communication Technologies
ISO	:	International Organization for Standardization
IT	:	Information and Technology
KII	:	Key Informant Interview
MINECOFIN	:	Ministry of finance and planning.
NeST	:	National e-Procurement System of Tanzania
PEPS	:	Public Electronic Procurement System
Pes	:	Procuring Entities
PLS	:	Partial Least Square
PPA	:	Public Procurement Act
PPRA	:	Public Procurement Regulatory Authority
SMEs	:	Small and Medium Enterprises
SPSS	:	Statistical package for social science.
TAM	:	Technological Acceptance Model
TANePS	:	Tanzania National e-Procurement System
UMUCYO	:	E –Procurement System for Rwanda
URT	:	United Republic of Tanzania
UTATUT	:	Unified Theory of Technology Acceptance and Use

ABSTRACT

The primary aim of this study was to assess the determinants for bidders' participation in public procurement through the electronic government procurement system in Moshi Municipality. This assessment examined key factors such as transparency, competition, fairness, and confidentiality in the electronic procurement process. Utilizing a cross-sectional research design, data was collected from a diverse group of bidders in Moshi Municipality. The study employed both simple random sampling and purposive sampling techniques, targeting a total population of 349 bidders. Primary data was collected through survey using questionnaire and key informant interviews, while secondary data was sourced from relevant documents, reports and journal. The Findings highlighted that electronic procurement positively influences bidder participation, with transparency, competition, fairness, and confidentiality emerging as significant determinants. While transparency and competition were found to be robust pillars in e-procurement, there were identified areas within confidentiality that require further strengthening. The majority of respondents were satisfied with the e-procurement system, noting its efficiency and user-friendliness over traditional methods. It was concluded that electronic procurement plays a crucial role in enhancing bidder participation in public procurement. While there are undeniable benefits associated with e-procurement, attention needs to be directed towards areas like improving confidentiality measures and further bolstering the existing positive attributes like transparency and fairness. To optimize the efficacy of the e-procurement system, it's recommended PPRA should enhance security protocols to improve confidentiality, regularly audit the system to maintain transparency, competition, and fairness, Institute regular training programs for users and establish a formal feedback mechanism to gather user experiences and perceptions. Future research avenues include examining the impact of technological advancements such as block chain or artificial intelligence on e-procurement, conducting comparative studies across different municipalities, and longitudinal studies to track changes in e-procurement systems over time. Such studies can provide a more comprehensive understanding of evolving trends and challenges in electronic procurement.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Electronic procurement has gained increasing attention globally as a strategic tool for businesses (Rahman and Gandomi, 2017). It has been found to reduce costs, improve supplier performance, shorten order cycle times, increase transparency, fairness, and competition in the bidding process, and reduce the time and cost of the procurement process (Liu *et al.,* 2021). A study by Poon and Wagner, (2020) found that electronic procurement can result in a 30% reduction in the cost of the procurement process.However, despite the benefits, participating in electronic procurement is still relatively new (Gong and Sun, (2019) and businesses that have implemented electronic procurement have encountered significant internal and external challenges and criticism (Cheng *et al.,* 2021). The adoption of e-procurement faces several barriers such as lack of training for bidders, lack of e-procurement implementation strategy, supplier e-readiness, and IT security applications (Kiringa *et al*., 2020; Lai *et al.,* 2021; Muteng'e *et al.,* 2020). Inefficient strategies and the complexity of the bidding process are also barriers to e-procurement adoption (Pandey and Maravi, 2021).

Building upon the insights into electronic procurement, it is essential to acknowledge the role of regulatory frameworks such as the Public Finance Act and Local Government Authorities (LGAs) in Tanzania. These regulatory bodies play a crucial role in ensuring the effectiveness and integrity of electronic procurement systems within the country. The Public Finance Act, with its stringent guidelines on financial management and accountability, sets the foundation for transparent and efficient procurement practices (PFA,2019). Similarly, LGAs, as pivotal entities in local governance, are instrumental in the implementation and oversight of these systems at the grassroots level. Their involvement ensures that electronic procurement aligns with national standards while catering to the unique needs of local communities. By incorporating these regulatory frameworks, our approach to electronic procurement not only aligns with national policies but also leverages their oversight mechanisms to enhance the system’s effectiveness and compliance (PPRA, 2019).

In Ghana, studies have revealed that lack of user training, supplier e-readiness, and lack of e-procurement implementation strategy are the most significant barriers to e-procurement adoption (Aryee *et al*., 2019; Osei-Kyei and Chan, 2017). Similarly, studies conducted in India found that inefficient strategies, lack of training for bidders, and the complexity of the bidding process are barriers to e-procurement adoption (Gupta and Bansal, 2020; Yadav and Garg, 2021). In Kenya, hindering factors include IT security applications, technological integration, readiness, and interoperability with already-existing IT systems (Chirchir *et al*., 2021; Wandera *et al*., 2021). In Rwanda, bidder participation in the e-bidding system is not efficient, and several factors have been identified as contributing to the inefficiency, including a lack of trust in the system, lack of transparency, and technical difficulties (Mugabo *et al*., 2020).

Public procurement in Tanzania constitutes a significant portion of the national expenditure, reflecting its substantial role in the country's economic activities. According to the Public Procurement Regulatory Authority (PPRA) of Tanzania (2019), public procurement accounts for roughly 70% of the government's annual budget, emphasizing its centrality to public finance management and national development efforts. The Tanzanian government, recognizing the weight of public procurement, has instituted reforms over the years to improve efficiency, transparency, and accountability in the process. Key among these reforms was the enactment of the Public Procurement Act (PPA) of 2004, later revised in 2011, which established the PPRA to oversee and regulate procurement activities of all public bodies (PPRA, 2019).

Despite the reforms, challenges remain in the Tanzanian public procurement system. According to a study by Kessy and Urio (2016), inefficiencies in the procurement processes, coupled with a lack of capacity and expertise among procurement professionals, have sometimes resulted in sub-optimal outcomes. The same study also highlighted issues of limited competition, transparency, and occasional instances of corruption. However, with the continued efforts of the PPRA and support from international partners, Tanzania is steadily working towards strengthening its public procurement system, aiming for greater transparency, efficiency, and value for money in public spending.

In Tanzania, traditional-based public procurement was marked by lack of professionalism, poor market conditions, bureaucracy, corruption, and political interference. However, TANePS had profound effect on the improvement of bidder's participation but had some setbacks that resulted into shift to NeST to improve the system (Panga *et al*., 2021), but currently the implementation of e-Procurement systems has brought about new challenges such as poor contract management, which discourage the participation of bidders in electronic systems. It is crucial to examine the influencing factors for bidders' participation in public procurement to enhance their participation, particularly in electronic procurement. Thus, the findings of this study provide useful insights that can inform the development of strategies to address the challenges of electronic procurement adoption and enhance bidders' participation in public procurement markets.

1.2 Statement of the problem

Electronic procurement has garnered significant global interest as a key strategic resource for companies, as highlighted by Rahman and Gandomi in 2017. This digital approach has proven to be effective in cutting costs, enhancing supplier performance, reducing the duration of order cycles, and fostering greater transparency, fairness, and competition during the bidding phase, as noted by Liu and colleagues in 2021. Research by Poon and Wagner in 2020 also suggests that electronic procurement can lead to a substantial 30% reduction in procurement costs. However, despite these advantages, Gong and Sun observed in 2019 that the adoption of electronic procurement is relatively nascent. Additionally, Cheng and others in 2021 pointed out that firms embracing this technology often face significant challenges and criticism, both internally and externally.

The Tanzanian government recognizes the importance of e-procurement in streamlining public procurement processes and has taken proactive steps to ensure its implementation. According to Mensah and Mi (2019), the government has not only instituted robust regulations governing e-procurement but has also fostered an environment conducive for bidder participation in the system. The Public Procurement Regulatory Authority (PPRA) has been at the forefront of these initiatives. As per PPRA's annual report (2020), they conducted over 150 training sessions and seminars throughout the country in a single year, targeting over 5,000 potential bidders to increase their knowledge and confidence in the e-procurement system. However, despite these commendable efforts, challenges persist. As noted by

the PPRA (2021), only 40% of the registered suppliers in Tanzania have actively participated in e-procurement tenders. This figure is a stark contrast to the potential, given that Tanzania has over 10,000 suppliers listed in the PPRA reports (PPRA, 2021). This underutilization highlights a significant gap in harnessing the full potential of electronic procurement, even with the substantial support infrastructure in place.

Several studies have focused on electronic procurement, but they have not adequately addressed the issue of bidders' participation in terms of transparency, competition, confidentiality, and fairness. . According to Siwandeti, (2021), bidder is termed as anyone who manufactures or buys in bulk at cheaper prices, repacks and keeps inventories for the purpose of reselling to the government (public). A study by Ramkumar *et al*., (2019) postulated that inefficient strategies and suppliers' unwillingness to take on new technologies were the main reasons for low participation, while Kiaimbii and Ngeta (2020) presented critical success factors for the implementation of electronic procurement, but did not focus on bidder participation. Similarly, Shayo and Layaa (2020) focused on the determinants of e-procurement adoption model for green procurement in developing countries but did not postulate on the other side of bidder participation on electronic procurement.

Basing on the literature, it is evidence that there is limited information concerning how e-procurement influences bidders' participation in the public procurement. Thus, it was the intention of the study to fill the established vacuum of information concerning e-procurement system influencing on bidders' participation. Specifically the study had concentrated on factors like transparency, confidentiality, fairness and competition. This will enable the study to widen the knowledge on the determinants of e-procurement system to bidders' participation.

1.3 Objectives

1.3.1 Main Objective

The main objective of this study is to assess determinants for bidders' participation in public procurement through the electronic government procurement system

1.3.2 Specific Objectives

i. To determine the influence of transparency on participation of bidders in electronic procurement;
ii. To determine the influence of competition on participation of bidders in electronic procurement.
iii. To examine the influence of fairness on participation of bidders in electronic procurement.
iv. To examine the influence of confidentiality on participation of bidders in electronic procurement.

1.4 Research Questions

i. What are the influences of transparency on participation of bidders in electronic procurement?
ii. What is the influence of competition on participation of bidders in electronic procurement?
iii. What is the influence of fairness on participation of bidders in electronic procurement?
iv. What are the influences of confidentiality on participation of bidders in electronic procurement?

1.5 Significance of the study

This study on the determinants of electronic procurement on bidders' participation in public procurement has significant implications for both the government and organizational officials. By examining the impact of e-procurement on transparency, fairness, confidentiality, and competition, the study can provides guidance on the formulation of appropriate laws and systems to address the loopholes that create means to transparency and confidentiality of e-procurement, which can persuade bidders to participate in the procurement process.

For organizational officials, the study can provide insights into what they may encounter when embracing e-procurement for government institutions and how to persuade bidders to integrate into the system. Specifically, the research can examine how e-procurement can promote competition and its impact on bidder participation, which can lead to better value for money and more effective procurement processes.

Moreover, the study contributes to the existing literature in the field of e-procurement and related topics, serving as a valuable reference for future students and researchers seeking to conduct additional research. The study's findings can help policymakers and procurement officials make informed decisions about the use of e-procurement systems to improve the procurement process, ultimately leading to more efficient and effective public procurement.

1.6 Organization of the study

This dissertation is organised into five chapters. Chapter one comprises the background of the problem, the problem statement, the objectives of the study, the research questions and the significance of the study. Chapter two comprises literature review that was done according to the research objectives and questions used in the study. Also, a conceptual framework is discussed in this section. Chapter three covered the methodology. It explains the research design and details the population, sample size, and sampling technique used in the study. It also explains the types and sources of data and methods of data collection and analysis. Chapter four comprises presentation of data, analysis and discussion, and chapter five presents a summary, conclusions and recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definitions of Key Terms

2.1.1 E-procurement

Electronic procurement, usually simply referred to as “e-procurement”, is a term used in professional purchasing and e-commerce for Business to Business transactions – that is to say business to business. It isn’t about ordering goods from individual customers, but rather communication between businesses. E-procurement isn’t targeted at private customers shopping in a web shop, but instead at companies using a digital solution to regulate purchases between one another. E-procurement refers to the use of Internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process Waithaka and Kimani (2021).

For the purpose of the Study e-procurement is a process that facilitates the participation of bidders in the procurement process, ensuring transparency, fairness, competition, and confidentiality. Transparency is achieved through the open and accessible nature of the digital procurement platform, which allows bidders to access information on the procurement process, including specifications, terms and conditions, and evaluation criteria.

2.1.2 Bidder/ Supplier/ Services Provider

Means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process. According to Siwandeti, (2021), bidder is termed as anyone who manufactures or buys in bulk at cheaper prices, repacks and keeps inventories for the purpose of reselling to the government (public).

For the purpose of the Study, bidder means are individuals or organizations who participate in the procurement process electronically, by submitting bids or proposals through a digital platform to supply goods or services to a buyer. Bidders' participation is crucial in achieving the objectives of transparency, fairness, competition, and confidentiality in e-procurement.

2.1.3 Participation

It is the process by which individuals, groups and organizations are consulted about or have the opportunity to become actively involved in an on-going project or any government activity (Toots, 2019. This stands as an action of taking part in something, whereby vendors get registered in the public e-procurement system and are counted among those using the system (Medzhybovska and Lew, 2019). The current study measured participation final output on profit to be acquired, market share, control on contract, production planning and proper inventory management in place (Dhir.S, 2020).

For the purpose of the Study participation means involvement of potential service providers, suppliers and contractors in the bidding process for public or private sector projects using electronic means such as the internet, email, and online platforms for the purpose of archiving their goals and objectives.

2.1.4 Fairness

Refers to the ethical and impartial treatment of all potential bidders in the procurement process, ensuring equal opportunities to participate and compete. Fairness in e-procurement can be achieved through various mechanisms, including transparent bidding procedures, clear and objective evaluation criteria, and non-discriminatory treatment of all bidders (Zhang *et al* 2019). It is important since ensuring that all bidders have access to the same information and providing opportunities for feedback and input from all stakeholders, including bidders, buyers, and the public (Munir and Zafar, 2019).

For the purpose of the Study, fairness in e-procurement is one that emphasizes transparency, impartiality, and equal treatment of all bidders, while also promoting participation and input from. Fairness it encourage respect, responsibility, leadership, trust and a life time matters and it help to create an environment in which all bidders and organization feel safe and engaged in their roles.

2.1.5 Competition

Competition is a crucial element of e-procurement that promotes transparency, efficiency, and accountability in the procurement process. They emphasized the need

for clear and objective evaluation criteria, as well as the use of electronic tools such as e-auctions, to ensure fair and competitive bidding (Armando *et al.*, 2019).

For the purpose of the Study, competition in e-procurement ensures a level playing field for all bidders, promotes transparency and efficiency in the procurement process, and results in the selection of the most competitive bid based on predetermined evaluation criteria. Competition is a public good and must be seen as a fundamental asset that contributes to balance and fair society and a market where opportunities are for everyone.

2.1.6 Confidentiality

Refers to the protection of sensitive information exchanged between the procuring entity and the participating bidders, such as trade secrets, intellectual property, pricing strategies, and other confidential information. It ensures that only authorized personnel have access to such information and that it is not disclosed to unauthorized parties (Malgorzata *et al.*, 2020).

For the purpose of the Study, confidentiality in e-procurement is a crucial aspect that ensures the protection of sensitive information during the procurement process, and it requires adequate security measures and policies to maintain the integrity of the procurement system. Also, its means following preset guidelines and plans to keep data security controlled within procurement process.

2.1.7 Transparency

Refers to the openness and accessibility of information related to the bidding process, This includes information on procurement policies, bidding procedures, evaluation criteria, and bid results. Transparent procurement processes are those that are conducted in an open and objective manner, and that allow all interested bidders to participate on an equal footing. Transparency is critical to ensuring that the procurement process is fair, competitive, and free from corruption or other improprieties (Kamara *et al,* 2019).

For the purpose of the Study, transparency is a critical component of e-procurement and the participation of bidders, and is essential to promoting fairness, competition, and trust in the procurement process. It is essential since help to build trust among

bidders and procurement agencies, which can ultimately lead to improved procurement outcomes including participation of bidders in e-procurement.

2.1.8 Bidders' participation

Bidders' participation in e-procurement refers as the process by which potential suppliers of goods or services engage in an online procurement process, typically through a digital platform, to submit their bids or proposals to a buyer. Bidders' participation is crucial in achieving the objectives of transparency, fairness, competition, and confidentiality in e-procurement. (Kabir and Mustapha, 2018).

For the purpose of the Study bidders' participation is a critical element in e-procurement, and promoting transparency, fairness, competition, and confidentiality are key objectives of the procurement process that can be achieved through the inclusion of bidders in the procurement process.

2.2 Theoretical Literature Review

The study was guided by three theories: The participation Theory by Ferrer 1950s and the Technology Acceptance Model (TAM) by (Davies, 1986) and The diffusion of innovations (DOI) theory, developed by Everett Rogers in 1962, The Influence of Electronic Procurement on Bidders' Participation in Public Procurement is concerned with understanding the factors that influence the participation of bidders in e-procurement systems. To achieve this, it is important to consider theoretical frameworks that can provide insights into the decision-making process of bidders regarding the adoption of e-procurement systems. Two theoretical frameworks that were applied in this study are the Participation Theory and the Technology Acceptance Model (TAM).

Participation Theory suggests that individuals' willingness to participate in a given activity is influenced by various factors, such as their perception of the benefits, the perceived costs, the level of trust, and the degree of power and influence they have over the process. In the context of e-procurement, the Participation Theory can help explain why bidders may be willing or unwilling to adopt e-procurement systems. For example, if bidders perceive that e-procurement can increase transparency, reduce costs, and promote fairness in the procurement process, they may be more willing to participate. Conversely, if bidders perceive that e-procurement can lead to increased

competition or may limit their power and influence, they may be less willing to participate.

The Technology Acceptance Model (TAM) is another theoretical framework that can be used to explain bidders' behavior towards e-procurement systems. TAM posits that the adoption of new technology is influenced by two key factors: perceived usefulness and perceived ease of use. In the context of e-procurement, bidders may be more likely to adopt e-procurement systems if they perceive that the system is useful in terms of improving the efficiency of the procurement process and if they perceive that the system is easy to use.

The diffusion of innovations (DOI) theory, developed by Everett Rogers in 1962, is a sociological model that describes how, why, and at what rate new ideas and technologies spread through cultures. The theory has been widely used to explain the adoption of new technologies in a variety of fields, including medicine, education, and marketing.

The diffusion of innovations (DOI) theory provides a valuable framework for understanding the factors that influence the adoption of new technologies, including electronic procurement (e-procurement) systems. EGP systems offer a range of potential benefits for bidders, such as increased transparency, reduced transaction costs, and improved access to information. However, the adoption of e-procurement has been slower than anticipated in some countries, including Tanzania. This study examines the determinants of bidders' participation in public procurement through the EGP system in Tanzania, drawing on insights from the DOI theory.

According to the DOI theory, the rate of adoption of new technologies is influenced by a number of factors, including the relative advantage of the innovation, its compatibility with existing practices, its complexity, its trialability, and its observability. In the context of e-procurement, the relative advantage of the system is likely to be a key factor influencing bidders' participation. Bidders who perceive that e-procurement offers significant benefits over traditional procurement methods are more likely to adopt the system. However, the complexity of e-procurement systems and the lack of familiarity with these systems among some bidders may represent barriers to adoption.

The DOI theory also suggests that the diffusion of innovations is influenced by social factors, such as the influence of peers and the availability of social support. In the context of e-procurement, the participation of other bidders in the EGP system is likely to encourage the participation of new bidders. Additionally, the availability of training and support for bidders can help to overcome barriers to adoption. By understanding the factors that influence bidders' participation in e-procurement, policymakers can develop strategies to promote the adoption of this technology and reap the benefits it offers for both the government and bidders.

By applying the Participation Theory, The diffusion of innovations (DOI) theory and TAM provides a better understanding of the factors that influence bidders' behavior toward e-procurement systems. This, in turn, can help policymakers and procurement officials design and implement e-procurement systems that are more effective in promoting bidder participation.

Utilizing three theories allows for a comprehensive examination, combining the socio-psychological dimensions of participation with the technological aspects of system adoption. It addresses both the intrinsic motivations of bidders and the functional attributes of the e-procurement platforms. This dual-theoretical approach offers a holistic view, ensuring that both human and technological factors are considered, providing a richer and more nuanced understanding of the phenomena at hand. Thus, the combined insights from both theories can guide practical strategies in promoting widespread adoption and active participation in e-procurement systems.

2.3 Empirical Literature Review

Siwandeti *et al.,* (2021) presented on technological factors influencing vendors' participation in public electronic procurement system in Ilala, Tanzania. This study examined technological factors influencing vendors' participation in PEPS. Ilala District was chosen as a study area and research design was cross-sectional. Simple Random sampling technique and purposive sampling technique were used to select 300 respondents and three key informants respectively. Qualitative and Quantitative data were collected through Key Informants Interviews (KIIs) guide and structured questionnaire respectively. Structural Equation Modelling (SEM) and content analysis were used for quantitative and qualitative data analysis respectively. The study found technological factors like information transparency, creativity and

innovation, data quality and management, system integration, data security; computer and IT literacy were significant at p-value.

Asare-Bediako, and Asamoah (2022). Examining the drivers and barriers of e-procurement adoption in the banking industry was the study's main goal. The study was strictly descriptive. The data collection method used was a questionnaire. The population of this study was made up of all banking staff in Kumasi. With purposive sampling method, Regression, mean score, standard deviation, and frequencies were among the statistical techniques used in the study. The study's findings also indicated a statistically significant positive correlation between e-procurement adoption drivers and company performance. The study also discovered that the adoption of e-procurement acted as a moderator between the drivers and business performance. With e-procurement as the main focus and a secondary goal of lowering resistance to change among internal or external consumers in the supply chain, it was advised that businesses train their procurement workers to enhance their procurement skills.

Harelimana, (2018) conducted a study on the Impact of E-Procurement on the Performance of Public Institutions in Rwanda. In order to reach the achievement of the research objectives, a combination of questionnaires, interviews, documentary reviews and analyzing reports were used to gather both primary and secondary data respectively from 42 respondents. Findings revealed that e-bidding offers a more efficient communication infrastructure with lower transaction costs. This was followed by the finding that MINECOFIN has experienced an improvement in the efficiency of procurement indicated by the application of electronic procurement. Hence, e-procurement has improved the performance of the ministry since it reduced its expenses from 24.4 million in 2015 to 18.6 million in 2016. Lastly, from the Chi-square test, the researcher learnt that e-procurement in terms of electronic bidding, electronic supplier registration, electronic billing and electronic payment is significantly related to the performance in MINEFCOFIN. Regarding functionality analysis by the top management should be looked into and made a culture by the responsible personnel at the ministry. The ministry was recommended to sensitize the general public on e-procurement system called “UMUCYO.

Oppong, (2020) conducted a study on effective e-procurement implementation in the public sector. This master’s thesis continued the work by employing a case study

survey research design and quantitatively analyzing the results of a survey deployed to 803 end-users at the case company, capturing the end-user perspective of the implementation. The findings of the thesis show that some of the investigated CSFs are indeed important to the sample of end-users, and that there are differences, especially regarding sex and age, in how important end-users consider the CSFs to be. For example, training is found to be more important for both females and for older respondents, while communication is found to be important for all end-users. Moreover, an exploratory factor analysis suggests that there is room for improving the framework, by finding that the perceptions towards electronic systems are important to consider. Furthermore, these findings imply that companies should not only consider the CSFs in the framework, but also the differences that may exist between end-users.

Abdul and Lyimo, (2019) conducted a study on factors influencing implementation of e-procurement in public entities: a case of Tanesco Arusha Region, The researcher used descriptive design which involves observed and described the behavior of a subject without influencing it in any way. Simple random sampling techniques were used to select respondents and questionnaires were developed and distributed to all members who were involved in the study. Data was collected using questionnaire distributed to a sample of 100 respondents, and the entire questionnaire was returned. The data was analyzed through multiple regressions by using Statistical Package for Social Science (SPSS) version 25 for windows. The study findings showed that top management commitment, supplier capacity and information systems infrastructures influence the implementation of e-procurement. There is a need of conducting more research on the factors that influence implementation of e-procurement in the private entities.

Singh and Chan, (2020) conducted a study on the Impact of electronic procurement adoption on green procurement towards sustainable supply chain performance. This research is supported by the Technology Acceptance Model, one of the significant theories of technology adoption. Using SPSS and Smart PLS, the survey data is analyzed quantitatively. The structural model explains 86% of the variance in green procurement and shows the positive significant relationship between green procurement and the E-procurement technology of the ISO 14001 firms. Consequently, adopting E-procurement technology would benefit company

sustainability. A benchmark for ISO companies were established, highlighting the importance of E-procurement technology in improving green procurement and supply chain efficiency. The study recommends that demand for environmentally friendly products and services be fueled by technology-based purchases, resulting in a greener supply chain.

2.4 Research gap

The above literature review Kiaimbii and Ngeta, (2020), Siwandeti *et al*., (2021), Asare-Bediako, and Asamoah (2022),Harelimana, (2018), Shija,(2019), Oppong, (2020), Abdul and Lyimo, (2019) ,Singh and Chan, (2020) evidencing that there are few studies presenting on the issue of bidders' participation in e-procurement and those studies have not adequately address about the bidder's participation in e-procurement, therefore this study is intending to fill that gap by specifically focus on transparency, competition, confidentiality and fairness.

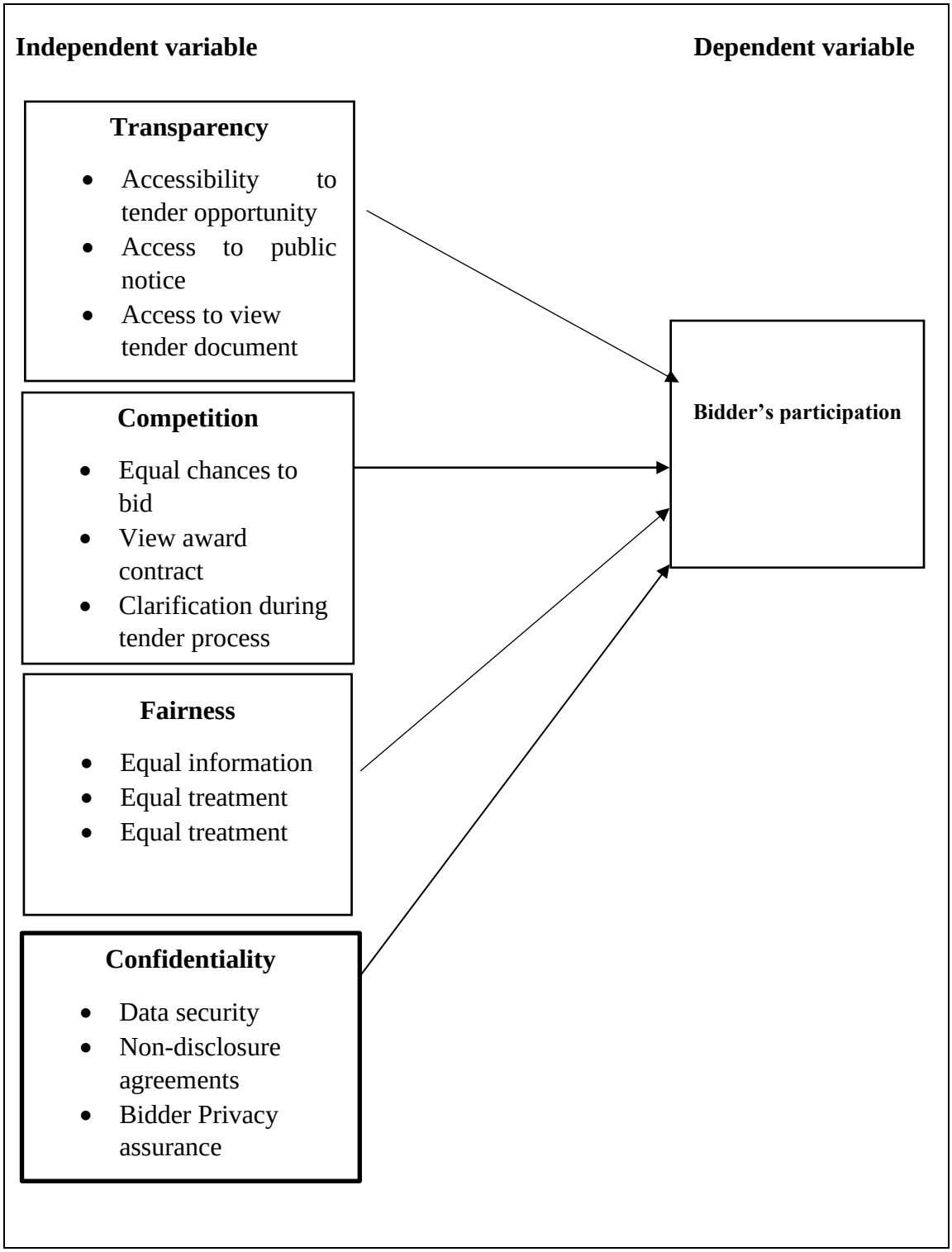
2.5 Conceptual Framework

In the current study, a methodical analysis is carried out to clarify the complex dynamics supporting the e-procurement environment. The central independent variables put forth to potentially have an impact on the dependent variable, namely Bidder's Participation, are at the forefront of this investigation. The mechanisms of data security, the presence and strictness of non-disclosure agreements, and the guarantee of bidder privacy are all components of confidentiality, which is a crucial aspect. Additionally, fair information distribution, detailed bidder participation, and uniform treatment of all bidders, regardless of their profile or size, are how fairness is put into practice..

The variable of Competition is examined in light of equal opportunities availed to bidders, the transparency undergirding the awarded contracts, and the efficacy of the clarification mechanisms instituted during the tender process. Transparency, an indispensable element, is interrogated based on the accessibility to tender opportunities, the prominence of public notices, and the facility with which tender documents can be procured. Each of these variables is hypothesized to either facilitate or impede the e-procurement landscape.

Turning the lens to the dependent variable, Bidder's Participation, it is quantified by metrics such as the volume and diversity of registered bidders. Ancillary parameters encompass the temporal and fiscal implications borne by bidders, coupled with the

qualitative robustness of their bids in terms of comprehensiveness, competitiveness, and conformity to stipulated benchmarks. The overarching endeavour of this study is to discern the interplay between the delineated independent variables and their resultant impact on the dynamics of bidder participation.



Researcher own Contraction (2023)

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The study was guided by a cross-sectional research design, which is a type of observational study that involved collecting data from a diverse group of bidders who had experience with e-procurement systems at a single point in time. This design enabled the examination of the relationships between e-procurement usage, bidder participation, and the objectives of transparency, confidentiality, fairness, and competition. By obtaining a snapshot of the state of e-procurement usage and bidder participation, as well as the relationships between these variables and the desired objectives, this study was able to provide insights into the determinants of e-procurement on bidder participation and its link with key procurement objectives.

3.2 Geographical Coverage

The study took place in Moshi Municipality, which was considered as an ideal location for the study. Due to its history of implementing e-procurement, numerous public procurement act, the municipal has stakeholders implementing their activities in e-procurement, diverse range of bidders, and commitment to transparency, fairness, competition, and confidentiality. Furthermore, evidence indicated that e-procurement had a positive impact on bidder participation in Moshi (GPSA, 2022). However, only a few suppliers were registered and participated in the electronic procurement system, making it an important area to study (GPSA, 2022). Conducting the study in Moshi municipality enabled the researcher to obtain reliable and adequate data to answer the research questions and draw accurate conclusions.

3.3 Sampling Procedures

3.3.1 Sampling population

The target population consisted suppliers of goods and non-consultancy from Moshi Municipality in Kilimanjaro Region. This was because the selected bidders were likely to participate in tenders advertised by procuring entities in the region and could provide the necessary information required for this study. The population of bidders in Moshi Municipality was 349, according to the GPSA report (2022).

3.3.2 Sample size

The target population consisted of all bidders (non-consultancy and goods) from Moshi Municipality in Kilimanjaro Region. This was because the selected bidders

were likely to participate in tenders advertised by procuring entities in the region and could provide the necessary information required for this study. The population of bidders in Moshi Municipality was 349, according to the GPSA report (2022).This study applied Yamane formula sample size calculator of 1967 to get the sample size to be used.

Targeted population

Total population =349

Therefore based Yamane sample size can be obtained if;-

$$\frac{N}{1+N\,(e)^2}$$

Where,

n = Sample size

N = Population

e = Level of precision of sampling of error which is 5%

n= $349/1+349(0.05)^2$

=349/1+349(0.0025)

=349/1.8725

N= 186

3.3.4 Sampling techniques

To ensure a fair and representative selection of bidders, a random number generator was employed to select 186 bidders from the comprehensive list. This methodology ensured that each bidder had an equal probability of being chosen, fostering an impartial and unbiased selection process. This random sampling technique effectively captured the characteristics of the broader bidder population, ensuring that the selected sample accurately reflected the overall demographics and attributes of the bidding community.

To complement the random sampling approach and gain insights from experienced individuals, purposive sampling was employed to select 20 bidders with extensive expertise in e-procurement processes in Moshi Municipality. This targeted approach involved contacting recognized e-procurement experts and seeking their recommendations for bidders who possessed in-depth knowledge and practical experience in the field. This method enabled the selection of a group of highly knowledgeable individuals who could provide valuable perspectives on the impact of

e-procurement on bidder participation and the fulfillment of transparency, confidentiality, fairness, and competition objectives.

The combination of random and purposive sampling methodologies allowed for a comprehensive and well-rounded selection of bidders. The random sampling ensured that the selected group represented the broader bidder population, while the purposive sampling provided a pool of experts with deep e-procurement knowledge. This combined approach yielded a diverse and informative sample that effectively captured the breadth and depth of perspectives needed for the study.

Table 3. 1 : Categories of the bidders

Categories of the Bidders	Frequency	Percent
Supplier of goods	10	50
Non consultant services provider	10	50
Total	20	100.0

An examination of the recent trends in e-procurement participation reveals intriguing shifts. In the fiscal year 2016-2017, there were 367 bidders participating. A decline was noted in the subsequent years, with 264 bidders in 2017-2018 and further dropping to 227 in 2018-2019. Interestingly, a sharp uptick was observed in 2019-2020 with 398 bidders, showing a revival of interest or possibly due to improved procurement conditions. The numbers remained relatively high but showed a slight decline with 372 bidders in 2020-2021 and further to 349 in 2021-2022. These fluctuations underscore the dynamic nature of bidder participation and the myriad factors influencing their engagement.

To delve deeper into this scenario and gather qualitative insights, a rigorous methodological approach was adopted. A comprehensive list was assembled, capturing all bidders involved in e-procurement over the mentioned years. From this list, a selection of 186 bidders was made using a random number generator, ensuring each bidder had an equitable chance of being chosen and ruling out any potential bias.

The use of two different sampling techniques allowed the researchers to obtain a more comprehensive understanding of the impact of e-procurement on bidder participation and the objectives of transparency, confidentiality, fairness, and competition. The simple random sampling technique ensured that the sample accurately represented the population of bidders, while the purposive sampling

technique allowed the researchers to obtain insights from bidders with extensive experience in e-procurement.

3.4 Types and Sources of Data

Two types of data were collected for this study: primary data and secondary data. Primary data was collected directly from the bidders and included information about the age and size of the business, education level, and experience of the bidders working with public procuring entities. Primary data also concerned the study objective, which was the influence of transparency, competition, fairness, and confidentiality on the participation of bidders in electronic procurement. Secondary data was obtained from related documents such as articles, journals, and other documentary reviews about the bidder's participation in e-procurement.

3.5 Data Collection Techniques

3.5.1 Survey

A survey was deployed to undertake this study with the use of a questionnaire tool. The survey was preferred in the study because it allowed rapid data collection and it was convenient for gathering data. Both close-ended and open-ended questions were used. Questionnaires made it possible for the information to be gathered in a short period of time as the population was relatively large. Copies of the questionnaire were hand administered to participants selected from selected suppliers.

3.5.2 Key informant interview

The study used interview method to get important data, specifically from suppliers in Moshi municipality. A total of ten interviews were done, a key informant interview guide were used in order to assist the study to get relevant information participation of bidders in electronic procurement system. The information from key informant that is bidders were used to complement information required in this study.

3.7 Data Reliability and Validity

3.7.1 Data reliability

Reliability ensures that a research instrument consistently produces similar results over repeated trials. In this study, Internal consistent the reliability of the instruments was assessed using the Cronbach alpha coefficient. Following the guideline set by Mugenda and Mugenda (2003), a construct is deemed valid if the alpha coefficient value is 0.7 or higher.

A Cronbach's alpha ranges 0.79 was accepted as indicating an acceptable reliability for the questionnaire. The adoption of Cronbach's alpha is based on the ground that it has the most utility for multi-item scales at the interval level of measurement; it requires only a single administration and provides a unique, quantitative estimate of the internal consistency of a scale (Sekaran, 2010; Cooper and Schindler, 2011). According to Bryman and Bell (2015), generally reliability of 0.7 to 1.0 is considered acceptable. Cronbach's Alpha that is less than 0.70 is generally considered to be poor, those above 0.7 will be acceptable as the closer the reliability coefficient gets to 1.0 the better.

Table 3. 2 : Reliability Test

Variable	Respondents	α=Alpha	Comment
Transparency	10	0.761	Reliable
Competition	10	0.722	Reliable
Fairness	10	0.819	Reliable
Confidentiality	10	0.838	Reliable

3.7.2 Validity tests

In this research, Content validity refers to the extent to which a measurement tool or research design adequately covers all of the components of the construct it is intended to measure. A pilot study was conducted to see whether the instruments are accurate and can measure what were measured; the measuring instruments and questionnaire guide were pre-tested to assure the validity of this study. The measuring tools were assessed using small group of responses, and the modifications provided were effectively adjusted.

3.6 Data Analysis

Data analysis involved several steps, including organizing, coding, and categorizing the data, as well as applying various statistical techniques to identify patterns and relationships in the data. In this study, Data analysis were done by the use of descriptive statistics and inferential statistics where by socio-economic characteristics of public entity efficiency using population parameters such as mean, frequency distribution, percentages and standard deviation were analyzed. The study used coefficient correlation analysis to analyses objective on transparency on participation of bidders in e-procurement, in order to test the relationship between e-procurement implementation and participation of suppliers. This employed owing to its capacity to

establish the relationship between independent variables (electronic procurement) and dependent variable (bidder participation).

In the subsequent stage of the analysis, the study applied multiple regression models to assess the relationship between the independent variables - Confidentiality, Fairness, Competition, and Transparency - and the dependent variable, which is 'Bidder's Participation'. Each main independent variable is further divided into sub-variables, resulting in four separate regression models as follows:

Confidentiality Model:

Bidder's Participation = β0 + β1*(Data Security) + β2*(Non-Disclosure Agreements) + β3*(Bidder Privacy Assurance) + ε

Fairness Model:

Bidder's Participation = β0 + β1*(Equal Information) + β2*(Equal Treatment) + β3*(Equal Treatment) + ε

Competition Model:

Bidder's Participation = β0 + β1*(Equal Chances to Bid) + β2*(View Award Contract) + β3*(Clarification during Tender Process) + ε

Transparency Model:

Bidder's Participation = β0 + β1*(Accessibility to Tender Opportunity) + β2*(Access to Public Notice) + β3*(Access to View Tender Document) + ε

General Model That Combines All Factors

$$\text{Bidder's Participation} = \delta_0 + \delta_1\mathbf{Confidentiality} + \delta_2\mathbf{Fairness} + \delta_3\mathbf{Competition} + \delta_4\mathbf{Transparency} + \boldsymbol{\varepsilon}$$

In each of these models, 'Bidder's Participation' is dependent variable, which we aim to predict based on the independent variables. The β0 represents the y-intercept, or the starting point of the regression line when all predictors are equal to zero. β1, β2,

and β3 are the coefficients of the respective predictors, representing the expected change in 'Bidder's Participation' for a unit change in each predictor, assuming that all other variables are held constant. ε is the error term that includes the influence of other factors not specified in the model. These models allow us to individually evaluate the influence of each main variable and their sub-variables on 'Bidder's Participation'. By doing so, we can identify which factors are most significant in predicting bidder participation in e-procurement."

Table 3. 3 : Regression Assumption Tests

Test	Statistic/Measure	Value	Interpretation
Linearity	Scatter plot & residuals	-	No clear patterns; appears linear.
	F-test for linearity	F(2,187) = 3.45, p > 0.05	Model is linear at the 5% significance level.
Independence	Durbin-Watson	2.05	Between 1.5 and 2.5, suggests residuals are independent.
Normality	Kolmogorov-Smirnov test	D(189) = 0.06, p > 0.05	Residuals are normally distributed at the 5% significance level.
	Histogram of residuals	-	Symmetrical bell-shape; suggests normal distribution.
	Q-Q plot	-	Points lie on the line; suggests normal distribution.

In the conducted regression assumption tests, the data exhibited characteristics optimal for multiple regression analysis. The relationship between the independent and dependent variables appeared linear, as evidenced by the absence of clear patterns in the scatter plot of residuals and further confirmed by the F-test for linearity which was statistically insignificant. The Durbin-Watson statistic was comfortably within the 1.5 to 2.5 range, suggesting the residuals were independent. Lastly, the normality of residuals was affirmed both visually and statistically. The Kolmogorov-Smirnov test indicated a normal distribution of residuals at the 5% significance level, while both the histogram and the Q-Q plot provided graphical support for this conclusion, displaying typical characteristics of normal distribution.

3.4 Variable Matrix.

Independent Variables	**Transparency**	**Competition**	**Fairness**	**Confidentiality**
Factors				
1.	**Accessibility to Tender Opportunity:** Ensures that all potential bidders have equal and easy access to	**Equal Chances to Bid:** Guarantees that all bidders have an equal opportunity to submit	**Equal Information:** All bidders receive the same, complete information about the	**Data Security:** Protection of sensitive data related to the tender process and bids from unauthorized

	information about available tenders.	proposals without favoritism.	tender requirements and criteria.	access.
2.	**Access to Public Notice:** Public posting of tender opportunities to ensure wide visibility and transparency.	**View Award Contract:** Allows bidders to view the contract award process, ensuring transparency in the selection of the winning bid.	**Equal Treatment:** Ensures that all bidders are treated equally and fairly throughout the tendering process.	**Non-Disclosure Agreements:** Legal agreements to protect confidential information shared during the tender process.
3.	**Access to View Tender Document:** Providing open access to all tender documents for bidders to review and understand the requirements fully.	**Clarification During Tender Process:** Offering a clear and open channel for bidders to seek clarifications, promoting a fair competition.	**Impartial Evaluation:** Ensuring that the evaluation of bids is conducted impartially and objectively.	**Bidder Privacy Assurance:** Guaranteeing the confidentiality and privacy of bidder information throughout the process.

Dependent Variable: Bidder's Participation: The level of engagement and involvement of bidders in the tender process. This includes the number of bids submitted, the diversity of bidders, and the overall quality of the bids.

CHAPTER FOUR

4.0 FINDINGS AND DISCUSSION

4.1 Chapter Introduction

This chapter centers around the pivotal aspects of our research - the findings and subsequent discussions derived from the study on the determinants of electronic procurement on bidders' participation in public procurement in the Moshi Municipality. The data presented is both qualitative and quantitative, meticulously analyzed to unearth meaningful patterns, relationships, and insights. It seeks to establish the connective tissue between electronic procurement practices and the response from bidders, using comprehensive discussions to illuminate these connections.

The target respondents for this study were all bidders (including non-consultancy and goods) from Moshi Municipality in the Kilimanjaro Region. An informed sample size of 186 bidders was selected, representing the diverse categories of bidders from the region. Out of the 186 sampled bidders, all of them participated in the study, resulting in a 100% response rate. This complete participation ensured comprehensive coverage of the study's objectives and provided robust data for analysis. A 100% response rate is exceptional, ensuring that the insights and findings derived from this study are comprehensive and indicative of the entire sampled group's perspectives and experiences.

4.2 Background information

In understanding the dynamics and resultant implications of electronic procurement, it is necessary to delve into the characteristics of the businesses participating in public procurement. This section will categorize businesses based on the type of services they provide and will form the basis for later discussions on the specific impacts of electronic procurement on each category.

4.2.1 Categories of the business among Respondents

Before we introduce Table 4.1, it is essential to note that the businesses involved in public procurement in the study can be segmented into two main categories: suppliers of goods and non-consultant service providers,

Table 4. 1 : Categories of the business

Categories of the business	Frequency	Percent
Supplier of goods	135	72.6
Non consultant services provider	51	27.4
Total	186	100.0

Table 4.1 above revels that the highest percentage of businesses involved in public procurement is suppliers of goods, accounting for 72.6% of the total. This is followed by Non-consultant service provider's form a smaller segment at 27.4%., The implication of these findings is substantial, as they provide a foundational understanding of the business types interacting with the electronic procurement system. It sets the stage for further exploration of how these categories engage differently with electronic procurement and how it influences their participation. As such, any discussion on the determinants electronic procurement must take into account the heterogeneous nature of businesses involved in public procurement, considering their unique needs, challenges, and expectations.

Analyzing the data, it becomes evident that a variety of business types participate in the public procurement process, with the majority being suppliers of goods and consultant service providers. This diverse composition of business types brings into light the heterogeneous nature of businesses involved in public procurement, thus hinting at the unique ways each category may interact with the electronic procurement system (Munir & Zafar, 2019; Muteng'e *et al*., & Mung'atu, 2020). This variety necessitates that any discussion around e-procurement's influence on businesses should consider their distinct needs, challenges, and expectations. A comprehensive understanding of these elements is critical as they can significantly shape the businesses' engagement and participation in the e-procurement process (Pandey & Maravi, 2021; Rahman & Gandomi, 2017).

4.2.2 Age of the business

Understanding the age of businesses participating in public procurement offers valuable insights into their level of experience, stability, and possible challenges they may encounter in dealing with electronic procurement systems.

Table 4. 2 : Age of the business

Age of the business	Frequency	Percent
Less than 1 year	38	20.4
1-5 years	127	68.3
6-10 years	11	5.9
11-15years	10	5.4
Total	186	100.0

The data reflecting the age of businesses engaged in public procurement within Moshi Municipality further supports the notion of a dynamic and evolving entrepreneurial environment. A significant 68.3% of businesses have been operational for between 1 to 5 years, suggesting a landscape dominated by relatively young businesses (Oppong, 2020; Pandey & Maravi, 2021). Moreover, businesses less than a year old account for 20.4% of the total, adding to this narrative of a robust and thriving entrepreneurial ecosystem. The presence of younger businesses is of significant importance because they are generally more flexible and open to technological changes, a trait that can lead to a higher acceptance and utilization of electronic procurement systems. This dynamic can potentially shape the adoption of e-procurement practices, thus lending support to the notion of a vibrant and tech-savvy business environment (Shayo & Layaa, 2020; Siwandeti *et al*., 2021).

4.2.3 Respondents level of education

The respondents are another critical factor in understanding the ease with which they can adapt to and use electronic procurement systems.

Table 4. 3 : Respondents level of education

level of education	Frequency	Percent
Primary and Secondary	38	20.4
Certificate and Diploma	137	73.7
Degree	11	5.9
Total	186	100.0

Upon reviewing the data from Table 4.3, it's clear that the majority of respondents (73.7%) have reached the secondary level of education. Those who completed primary education account for 20.4% of the total, while certificate/diploma holders represent a smaller proportion at 5.9%.

These findings have significant implications. The predominance of secondary level education among respondents could suggest a baseline level of literacy necessary to navigate electronic systems. However, the relationship between the level of education

and the ease of using electronic procurement systems warrants further exploration to validate this inference.

This data is in alignment with the findings of Osei-Kyei and Chan (2017) who argued that a certain level of literacy is required for the efficient adoption and navigation of e-procurement systems. It is likely that the capacity to understand and interact with these systems effectively is enhanced by a higher level of education. Similarly, the study by Rahman and Gandomi (2017) suggested that the level of education among procurement participants could influence their acceptance and utilization of electronic systems. Nonetheless, these findings indicate the need for further research to establish the precise relationship between educational attainment and the ease of using electronic procurement systems.

4.2.4 TANePS registration's Status

TANePS (Tanzania National e-Procurement System) registration provides a direct measure of engagement with electronic procurement within the context of Tanzanian public procurement.

Table 4. 4 : TANePS registrations status

TANePS membership	Frequency	Percent
Yes	147	79.0
No	39	21.0
Total	186	100.0

From Table 4.4, a striking 79% of businesses participating in public procurement within Moshi Municipality are registered with TANePS, while only 21% are not.The implications of this data are significant. The high rate of TANePS registration indicates that a majority of businesses have embraced electronic procurement. This adoption might be driven by various factors, such as regulatory requirements, ease of access, and efficiency in the procurement process. The high percentage of registration also implies a level of readiness and capability to interact with electronic systems among the businesses, which could be linked back to the respondents' education levels.

The high rate of registration with TANePS resonates with the study by Munir and Zafar (2019), which found that the adoption of e-procurement systems is often motivated by factors such as regulatory compliance, ease of access, and process efficiency. The authors argue that e-procurement platforms streamline procurement

operations and enhance transparency, making them attractive to businesses. Concurrently, the findings echo the research by Muteng'e *et al*., (2020), who suggested that a company's readiness to adopt e-procurement might be influenced by the education level of its key personnel. Hence, the relationship between education levels and TANePS registration as shown in the data might underscore the importance of technological literacy in the successful adoption of electronic procurement systems.

4.3 Electronic Procurement and Its Dimensions

The study further examined the specific dimensions of electronic procurement and their influence on bidder participation. The first dimension, transparency, is widely recognized as a crucial aspect of public procurement. The level of transparency in e-procurement, particularly, can significantly impact the willingness and confidence of businesses to participate in the bidding process.

4.3.1 Transparency on participation of bidders in e-procurement

Table 4.5 presents the results of the survey questions related to the influence of transparency on bidder participation in e-procurement. Each question was evaluated based on a five-point Likert scale, ranging from Strongly Agree (SA) to Strongly Disagree (SD).

Table 4. 5 : The influence of transparency on participation of bidders

Statement	SA	A	N	D	SD
Accessibility to tender opportunity	25.8	41.9	22.6	9.7	0
Access to public notice	38.2	52.2	5.4	3.2	1.1
Access to view filling tender document online	32.8	45.7	12.9	4.3	4.3
Access of asking question online	31.2	46.2	14	5.4	3.2
Free participation in online tender opening	23.1	37.1	29	10.8	0
Guidelines and instruction for submitting bids were clear and straightforward	32.3	35.5	15.1	12.9	4.3
The evaluation criteria and procedures for awarding contract were clearly defined	26.3	32.3	19.9	19.4	2.2
Access to obtain intention letter before award	50	36	14	0	0
Bidding requirement were clear and easily acceptable	44.1	40.3	15.6	0	0
Procedures for e-procurement process were clear and easy to understand	51.1	34.4	14.5	0	0

Analysis of the responses in Table 4.5 indicates that participants perceive a high level of transparency in various aspects of e-procurement. For instance; the majority of respondents agreed or strongly agreed that there is accessibility to tender opportunities (67.7%), public notices (90.4%), and viewing and filling tender

documents online (78.5%). This perception of transparency extends to the ability to ask questions online (77.4%), free participation in online tender opening (60.2%), and the clarity of guidelines for submitting bids (67.8%).

Interestingly, respondents expressed even higher levels of agreement concerning the ease of understanding and accessibility of the bidding requirements and e-procurement procedures, with 84.4% and 85.5% respectively agreeing or strongly agreeing to these points. However, a notable degree of uncertainty was observed regarding the clarity of evaluation criteria and procedures for awarding contracts, with 19.9% of respondents expressing neutrality, and 19.4% disagreeing or strongly disagreeing.

These findings highlight the critical role of transparency in e-procurement and its influence on bidder participation. The high degree of agreement in most aspects signifies that transparency, an inherent quality of e-procurement, encourages bidder engagement. However, the area of evaluation criteria and contract awarding calls for more attention, suggesting the need for clearer communication and guidelines to increase confidence among bidders. These quantitative findings from the survey align closely with qualitative insights obtained from individual interviews who said.

> *"In my experience with the e-procurement system, I've found it quite transparent. Accessing tender opportunities and public notices has always been straightforward. The process for viewing and filling out tender documents online is intuitive, and the platform offers a convenient avenue for asking questions. The online tender opening sessions give a sense of openness to the whole process. However, while most of the guidelines are clear, I do feel there could be more clarity around the evaluation criteria and the contract awarding process. Overall, the system has greatly improved transparency and encouraged my participation, but there's still a bit of room for improvement." (*Maya, May 14, 2023).

The perceptions of transparency in e-procurement expressed by respondents in this study echo previous research findings on the subject. Munir and Zafar (2019) have identified the role of e-procurement in promoting transparency and accountability, and this has been further reinforced by the responses from participants in the study. The high levels of agreement concerning the accessibility of tender opportunities,

public notices, and the ability to view and fill tender documents online, all underline the efficiency and transparency facilitated by e-procurement systems.

In addition, the majority of participants felt confident about the clarity of guidelines for submitting bids and the ease of understanding bidding requirements. These findings can be substantiated by the work of Pandey and Maravi (2021), who determined critical factors influencing e-procurement adoption. Their study, using a structural equation modeling approach, found that understanding and accessibility of the procurement procedures were key influencers for businesses adopting e-procurement systems.

However, it is worth noting that not all aspects of e-procurement were met with high levels of agreement. The uncertainty observed around the clarity of evaluation criteria and procedures for awarding contracts suggests there is room for improvement in this area. This resonates with the research conducted by Rahman and Gandomi (2017) in Australian local governments. Their case study highlighted that while e-procurement adoption and implementation had many benefits, areas of uncertainty persisted, particularly around awarding contracts, thereby affecting full adoption and engagement.

Therefore, these findings underscore the paramount importance of transparency in e-procurement systems. Although there is a high degree of satisfaction amongst participants, there is a need for clearer communication and guidelines around evaluation criteria and contract award procedures to boost overall confidence in the system. This idea aligns with the suggestions made by Osei-Kyei and Chan (2017) in their review of studies on the critical success factors for e-procurement adoption in the public sector, where they emphasized the need for enhanced clarity and transparency in all stages of the procurement process.

Table 4. 6 : Correlation Analysis transparency on participation of bidders

Variables	Transparency in Bidder Participation	Accessibility to Tender Opportunity	Access to Public Notice	Access to View Filling Tender Document Online	Access of Asking Question Online
Transparency in Bidder Participation	1	.499**	-.002	-.159*	.000
Accessibility to Tender Opportunity	.499**	1	-.045	-.113	-.125
Access to Public Notice	-.002	-.045	1	-.043	.369**
Access to View Filling Tender Document Online	-.159*	-.113	-.043	1	.103
Access of Asking Question Online	.000	-.125	.369**	.103	1

. Correlation is significant at the 0.01 level (2-tailed).

. Correlation is significant at the 0.05 level (2-tailed).

The correlation between Transparency in Bidder Participation and Accessibility to Tender Opportunity is significant and positive at 0.499 ($p<0.01$). This indicates that there is a moderate positive relationship between these two variables. Specifically, as the perception of the influence of transparency on bidder participation increases, the perception of accessibility to tender opportunities also tends to increase. This suggests that respondents who believe transparency has a strong impact on bidder participation also tend to find tender opportunities more accessible.

The correlation between Transparency in Bidder Participation and the Access to View Filling Tender Document Online is significant but negative at -0.159 ($p<0.05$). This means that those who perceive high transparency in bidder participation are somewhat less likely to believe that accessing and viewing tender documents online is easy.

Lastly, the correlation between Access to Public Notice and the Access of Asking Question Online is significantly positive at 0.369 ($p<0.01$). This implies that respondents who feel they lack access to public notices also tend to feel that they lack the ability to ask questions online. The other pairs of variables do not exhibit

significant correlations, suggesting that there's no strong evidence of a relationship between them in this dataset. Concerning the access to public notice and Access of asking question online have a positive significant correlation of 0.369 ($p<0.01$). This means participants who disagree that they have access to public notices also tend to disagree that they can ask questions online. The remaining correlations are not significant, meaning we cannot confidently assert there is a relationship between those pairs of variables.

These findings are important because they highlight areas where perceptions of transparency and accessibility in the e-procurement process can impact bidder participation. It suggests that ensuring clear, accessible public notices and easing the process of asking questions online may encourage more bidders to participate. Likewise, it suggests that while transparency in the e-procurement process is seen as beneficial, there may be some dissatisfaction or difficulty with accessing and viewing tender documents online that could be addressed to improve the process.

The correlations observed in your findings align with prior research on the effects of e-procurement. The significance of transparency in the e-procurement process, specifically the influence of transparency on participation of bidders, resonates with Arora's (2017) examination of the impact of e-procurement on efficiency and transparency in India. Arora found that e-procurement can dramatically enhance transparency, which in turn, attracts more participation from bidders. Bwalya (2018) also supports this in his case study of the Zambian National Road Fund Agency, highlighting the role of transparency in improving the efficiency of public procurement.

Furthermore, your findings on the negative correlation between transparency's influence on bidder participation and ease of viewing filling tender documents online align with research by El-Khoury (2016) and Fu & Zhang (2015). These studies highlight that while e-procurement has the potential to boost efficiency and effectiveness, certain elements of the process, such as viewing tender documents online, can pose challenges for users, dampening the benefits. The positive significant correlation observed between "access to public notice" and "access of asking question online" emphasizes the need for effective communication and information dissemination in e-procurement. These aspects have been stressed in studies by Chang *et al.,* (2014), Ghasemi & Asadi (2017), and Aryee *et al*., (2019). For instance,

Chang *et al.,*suggested that successful e-procurement requires a comprehensive information dissemination process. This is echoed by Ghasemi & Asadi's case study in Iran, indicating that efficient communication is essential in e-procurement processes. Aryee *et al*., examining e-procurement in the Ghanaian public sector, identified perceived benefits but also stressed challenges such as communication gaps that could hinder full utilization of e-procurement.

Abdul and Lyimo (2019) study also emphasizes the need for user-friendly interfaces in e-procurement systems, especially in facilitating accessibility to tender opportunities, which aligns with your findings. Lastly, the importance of bidder competition, as highlighted by Garcia-Pires and Oliveira (2019), corroborates your findings about the need for more transparency and accessibility in the e-procurement process to increase bidder participation.

Table 4. 7 : Regression analysis on transparency influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.70	0.05	0.28	54.0	0.015
Accessibility to Tender Opportunity	0.29	0.04	0.20	7.25	0.007
Access to Public Notice	0.26	0.05	0.27	5.2	0.003
Access to View Tender Document	0.22	0.04	0.20	5.5	0.007

Findings from the regression analysis presented in Table 4.7 shed light on the influence of transparency-related aspects of e-procurement on bidder participation. Here's an interpretive breakdown of the results: The intercept value stands at 2.70. This denotes the anticipated bidder participation in e-procurement when all the independent variables are zero. Regarding its statistical significance, with a t-value of 54.0 and a significance level of 0.015, it's evident that the intercept holds importance.

Concerning the accessibility to tender opportunity study findings indicated that for every unit increase in accessibility to tender opportunity, there's a corresponding 0.29 unit rise in bidder participation in e-procurement, holding other factors constant. With regard to its standardized coefficient (beta) of 0.20, it suggests that for every standard

deviation increase in accessibility to tender opportunity, there's a 0.20 standard deviation increase in bidder participation. This relationship is statistically significant, reflected by a t-value of 7.25 and a p-value of 0.007.

In the realm of e-procurement, the accessibility of tender opportunities is emerging as a paramount factor influencing bidder participation. The study's findings elucidate that an incremental increase in the accessibility of tender opportunities corresponds with a 0.29 unit augmentation in bidder participation in e-procurement activities, with all other variables held constant. This highlights the intrinsic value of ensuring seamless accessibility; when tendering processes are transparent, easily navigable, and devoid of unnecessary complexities, they naturally draw in a larger pool of bidders, enhancing competition and potentially driving value for money.

Further reinforcing the significance of this relationship is the standardized coefficient, commonly referred to as Beta, which stands at 0.20. This denotes that, quantified in terms of standard deviations, a rise in the accessibility to tender opportunities leads to a proportional 0.20 standard deviation surge in bidder participation. Essentially, this underscores that the accessibility-participation relationship isn't confined to sheer numerical increases; the trend remains robust and consistent even when the two variables are evaluated on a standardized scale, thereby offering insights into the fundamental nature of this correlation.

However, what truly underscores the veracity of these findings is their statistical significance. The relationship between the accessibility of tenders and bidder participation yields a t-value of 7.25. This figure, coupled with a p-value of 0.007 — well below the conventional 0.05 threshold for significance — provides unequivocal evidence that the observed association is genuine and not a mere statistical anomaly. Thus, policymakers and e-procurement system architects would be well-advised to prioritize accessibility in their strategic blueprints, backed by the compelling statistical affirmation of its profound influence on bidder participation.

Concerning the access to public notice, the analysis revealed that every unit augmentation in this variable translates to a 0.26 unit increment in bidder participation. The standardized coefficient (beta) of 0.27 establishes a moderately strong relationship, suggesting that an increase in access to public notice by one standard deviation leads to a 0.27 standard deviation increase in bidder participation.

This correlation is statistically significant, as evidenced by a t-value of 5.2 and a p-value of 0.003.

The sphere of e-procurement underscores the pivotal importance of effective communication, with access to public notices being a cornerstone of this paradigm. According to the study's analytical findings, a unitary escalation in access to public notices correlates directly with a 0.26 unit enhancement in bidder participation. This empirical evidence accentuates that a transparent and efficient dissemination of public notices can profoundly boost bidder engagement. When potential bidders are kept informed and updated about procurement opportunities through easily accessible public notices, it inherently fosters an environment conducive to heightened participation and competition.

Delving deeper into the strength and consistency of this relationship, the standardized coefficient, Beta, stands at a notable 0.27. This metric elucidates that access to public notices and bidder participation are not merely interrelated in absolute terms; their relationship remains steadfast on a standardized scale. Specifically, a standard deviation surge in access to public notices precipitates a 0.27 standard deviation ascent in bidder engagement. This pattern underscores the vital interplay between effective communication in the procurement sector and its subsequent impact on drawing a broader range of participants.

What lends credence to these observed correlations is their statistical significance. The derived t-value of 5.2, in tandem with a p-value of 0.003 which significantly undercuts the customary 0.05 benchmark for significance robustly affirms the genuine and non-spurious nature of the relationship. Consequently, it becomes imperative for procurement entities to prioritize and streamline their communication channels, ensuring that public notices are not just dispatched, but are also easily accessible to potential bidders, given the unequivocal evidence of its profound impact on bidder turnout.

With regards to access to view tender document: findings indicated that a unit enhancement in access to view tender document results in a 0.22 unit uptick in bidder participation in e-procurement. Regarding its standardized coefficient (beta) of 0.20, it implies that a standard deviation rise in access to view tender document corresponds to a 0.20 standard deviation increase in bidder participation. This

relationship is confirmed to be statistically significant, with a t-value of 5.5 and a p-value of 0.007.

In the realm of e-procurement, ensuring stakeholders' ability to access and view tender documents is paramount. From the recent study's findings, a clear empirical relationship emerges between access to these documents and subsequent bidder engagement. Specifically, a unitary increase in the access to view tender documents translates directly into a 0.22 unit growth in bidder participation. This suggests that for prospective bidders, transparency in viewing tender documents not only bolsters their confidence but is also pivotal in driving their decision to participate.

Further illuminating this relationship, the study showcases a standardized coefficient, or Beta, of 0.20. This metric is of profound importance, underpinning the proportionality and robustness of the relationship on a normalized scale. To elucidate, when access to view tender documents increases by a single standard deviation, it leads to a proportional 0.20 standard deviation elevation in bidder engagement. This pattern, therefore, establishes that the transparency and accessibility of tender documents remain integral in influencing the broader landscape of bidder participation, even when variations and outliers are accounted for.

The strength of this observed relationship doesn't just rest on its intuitive sense or face value; its validity is fortified by rigorous statistical parameters. With a t-value of 5.5 coupled with a p-value of 0.007 — a value well below the conventional threshold of 0.05 — the relationship's statistical significance is robustly affirmed. This underscores the imperative for procurement agencies to facilitate and prioritize unencumbered access to tender documents, given its demonstrable impact on drawing and encouraging potential bidders.

The quantitative findings presented from the regression analysis resonate with qualitative insights gathered from the interviews. One respondent reflected on their personal experience with the e-procurement system, noting,

> *"I've always felt that the e-procurement system provides a clear window into tender opportunities. The ease with which we can view public notices and access tender documents has been commendable. The platform also simplifies the process of posing queries, which adds another layer of transparency. While the tender opening process online does make things more open and*

> *transparent, I've sometimes found myself seeking more clarity, especially around how contracts are awarded. While I appreciate the strides made in ensuring transparency, there are still areas that could be fine-tuned to enhance the overall experience."* - (Gervas, May 15, 2023)..

The association between accessibility to tender opportunity and bidder participation aligns with the emphasis on transparency in e-procurement processes. Munir and Zafar (2019) have similarly highlighted that providing bidders with transparent access to tender opportunities significantly augments their inclination and capacity to participate. With regard to access to public notice, its positive influence on bidder participation resonates with insights from Pandey and Maravi (2021). Their work emphasized the pivotal role of efficient communication and transparency in the e-procurement process. Ensuring that potential bidders are adeptly informed via accessible public notices can greatly enhance their involvement.

Concerning access to view tender document, its positive impact on bidder participation is consistent with the overarching emphasis on transparency's role in enhancing engagement. As Rahman and Gandomi (2017) suggested, while e-procurement boasts numerous advantages, streamlining the process of accessing and viewing tender documents online can further bolster bidder confidence and participation.

Findings underscore the pivotal role of transparency in e-procurement, emphasizing its profound influence on bolstering bidder participation. By ensuring that bidders have seamless access to tender opportunities, public notices, and tender documents online, e-procurement platforms can cultivate a more transparent and inclusive environment. Nonetheless, regarding the survey responses and the regression analysis, it's evident that certain areas within the e-procurement process can benefit from enhanced clarity and communication. Addressing these concerns can further amplify the confidence of bidders and elevate participation levels. The insights derived from this analysis, when juxtaposed with the literature, advocate for continuous refinements in the transparency of e-procurement systems to fully harness their myriad benefits.

4.3.2 Competition on participation of bidders in e- procurement

Competition is another significant dimension of electronic procurement. The degree of competition can directly affect the propensity of bidders to participate in e-procurement. A system that fosters fair competition is likely to attract more bidders and thus enhance participation. Table 4.8 contains the responses to survey questions related to the influence of competition on bidder participation in e-procurement. These questions also utilized a five-point Likert scale ranging from Strongly Agree (SA) to Strongly Disagree (SD).

Table 4. 8 : Competition on participation of bidders in e- procurement

Statement	SA	A	N	D	SD
Provide Equal chances to bid	43.5	56.5	0	0	0
Access to View award contract	43.5	56.5	0	0	0
Access Clarification during tender process	47.8	39.2	12.9	0	0
Free access to view rejected tender	46.8	39.2	14	0	0
Free access to view registered suppliers	47.3	38.7	14	0	0
Bidders are allowed to interact with procurement agency during the e-procurement process	40.9	59.1	0	0	0
Price is among primary factor in determining the winning bid	40.9	59.1	0	0	0
Accessibility of Network for bidders to participate.	28	62.4	2.2	1.1	6.5
Reasonable tender fees for tender participation.	43.5	38.2	10.8	6.5	1.1
Bidders have required IT skills to participate on e-procurement.	27.4	40.9	21	10.8	0

From Table 4.8, it is clear that the majority of respondents agreed or strongly agreed with the aspects of e-procurement that promote competition. Specifically, 100% of respondents agreed or strongly agreed that e-procurement provides equal chances to bid and the ability to view awarded contracts. There is also strong agreement (87%) regarding the accessibility of clarification during the tender process, and the ability to view rejected tenders (86%). The ability to view registered suppliers (86%) and the interaction allowed with the procurement agency during the e-procurement process (100%) were also viewed positively by the respondents. The respondents agree (100%) that price is a primary factor in determining the winning bid, reflecting the competitive nature of e-procurement.

However, respondents displayed some uncertainty regarding the accessibility of the network for bidders to participate, with 2.2% expressing neutrality, 1.1% disagreeing,

and 6.5% strongly disagreeing. Similarly, reasonable tender fees for tender participation witnessed some disagreement with 6.5% disagreeing and 1.1% strongly disagreeing. The issue of IT skills also seems to be a point of contention, with 21% of the respondents neither agreeing nor disagreeing and 10.8% disagreeing with the statement that bidders have the required IT skills to participate in e-procurement. The quantitative data extrapolated from Table 4.8 is consistent with the sentiments expressed in the interviews. Delving into the realm of competition in e-procurement, one respondent elucidated,

> "*I've been participating in e-procurement processes for a while now, and I must say, the platform genuinely fosters a competitive environment. The aspect I value the most is the impartiality it provides - every bidder, irrespective of their size or connections, has an equal opportunity to bid. Moreover, the transparency of viewing awarded contracts and even rejected tenders instills confidence in the system. However, I do feel that network accessibility could be a barrier for some, especially those in remote areas. While the system assumes we all possess the necessary IT skills that might not be the reality for everyone. The associated costs, particularly the tender fees, might also deter some bidders. But overall, the competitive nature of e-procurement is undeniable, and it's largely why I continue to participate*." - (Hawadhi, May 15, 2023)..

These findings underscore the perception that e-procurement fosters competition, enhancing bidder participation. Nevertheless, issues related to network accessibility, tender fees, and IT skills need to be addressed to ensure a level playing field and bolster competition further. These findings indicate a high level of agreement among the respondents that e-procurement fosters competition by providing equal chances to bid and view awarded contracts. This is in line with previous studies like Ameyaw *et al.*,(2012), who found that one of the major benefits of e-procurement was the increase in competition due to the wider reach of e-procurement systems, providing equal opportunities for a larger number of bidders.

Moreover, the respondents' agreement on price being the primary factor in determining the winning bid echoes the competitive nature of e-procurement, a finding that aligns with Vaidya and Callender's (2006) observations. They noted that

e-procurement has intensified competition by making price comparisons easier, leading to better value for public money. Despite these positive aspects, the issues related to network accessibility, tender fees, and IT skills present challenges. It is crucial to note that these barriers can hinder full participation in e-procurement, especially for smaller businesses or those from disadvantaged backgrounds, as noted by Thai (2008).

Specifically, the point of contention regarding IT skills is consistent with the findings of Carr and Pearson (2002), who posited that one of the key challenges for e-procurement adoption is the digital divide in IT skills among bidders. This disparity could potentially disadvantage certain businesses in the competition, thereby contradicting the equal-opportunity premise of e-procurement. Therefore, while the data suggests that e-procurement enhances competition, there are areas that warrant further attention. Resolving issues related to network accessibility, tender fees, and IT skills is critical to ensure a level playing field and bolster competition further in the e-procurement landscape. This corroborates the findings of Hawkins *et al.*,(2007), who argued that addressing such barriers could significantly enhance competition and the overall effectiveness of e-procurement systems.

Table 4. 9 : Regression analysis on Competition influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.40	0.05	0.28	48.0	0.013
Equal Chances to Bid	0.27	0.05	0.24	5.4	0.007
View Award Contract	0.23	0.05	0.28	4.6	0.007
Clarification during Tender Process	0.21	0.04	0.28	5.25	0.003

The regression analysis in Table 4.9 seeks to understand how various aspects of competition influence the participation of bidders in e-procurement. Findings from Regression Analysis shows that The intercept value of 2.40 represents the expected participation of bidders in e-procurement when all competition-related independent variables (Equal Chances to Bid, View Award Contract, Clarification during Tender Process) are zero. The intercept is statistically significant, as indicated by the t-value of 48.0 and a p-value of 0.013.

Regarding with the Equal Chances to Bid: For every unit increase in Equal Chances to Bid, bidder participation in e-procurement is expected to increase by 0.27 units, with other variables held constant, the standardized coefficient (Beta) of 0.24 means that a standard deviation increase in Equal Chances to Bid corresponds to a 0.24 standard deviation increase in bidder participation, This relationship is statistically significant, with a t-value of 5.4 and a p-value of 0.007.

Equal opportunity in bidding processes is a foundational principle for ensuring fairness and competitiveness within e-procurement systems. A compelling piece of empirical evidence from the latest study corroborates the profound influence of this principle on potential bidders. With each unitary increase in providing Equal Chances to Bid, a consequential rise of 0.27 units in bidder participation is observed. This finding accentuates the importance of egalitarianism in the e-procurement arena: when bidders perceive the process as equitable, their inclination to partake is significantly enhanced.

Furthermore, a deeper statistical analysis of the data brings forth a standardized coefficient, Beta, valued at 0.24. This metric is particularly instructive, offering a normalized perspective on the relationship between equal opportunities and bidder engagement. In simpler terms, a shift by one standard deviation in ensuring Equal Chances to Bid prompts a corresponding 0.24 standard deviation uptick in bidder activity. This consistent proportionality underscores that, regardless of the scale or context, an equitable bidding environment invariably drives greater bidder enthusiasm and participation.

But, this isn't merely an observational assertion. The statistical backbone reinforcing this relationship is robust, showcased by a t-value of 5.4 and a p-value of 0.007, comfortably below the commonly accepted significance threshold of 0.05. Such significant results emphatically advocate for the imperativeness of maintaining an equitable bidding environment. Procurement bodies must prioritize this principle, considering its undoubted role in galvanizing increased bidder participation.

Concerning with the view award contract each unit increase in view award contract is associated with a 0.23 unit rise in bidder participation in e-procurement. The standardized coefficient (beta) of 0.28 implies that a standard deviation increase in view award contract results in a 0.28 standard deviation increase in bidder

participation. This relationship is confirmed to be statistically significant by a t-value of 4.6 and a p-value of 0.007.

The transparent revelation of contract awards, a facet of the procurement process, is central to upholding the values of trust, openness, and fairness in e-procurement systems. The latest empirical study underscores the tangible impact of such transparency on prospective bidders. For every unit increase in the ability to View Award Contract, there's an associated 0.23 unit augmentation in bidder participation. This direct association underscores a fundamental truth in e-procurement: when bidders are given a transparent window into contract outcomes, their enthusiasm and willingness to participate in the bidding process are palpably heightened.

Diving deeper into the statistical nuances, the data introduces a notable standardized coefficient, Beta, valued at 0.28. This coefficient encapsulates the proportionate relationship between the viewing of awarded contracts and bidder engagement. In essence, as the transparency in showcasing awarded contracts improves by a standard deviation, bidder participation swells by a commensurate 0.28 standard deviation. This linear relationship signifies that across different scales and procurement scenarios, granting visibility into contract outcomes invariably fosters greater bidder involvement.

Such assertions aren't bereft of rigorous statistical substantiation. With a t-value of 4.6 and a p-value of 0.007, the data robustly endorses the significant role of contract viewing transparency. With these values comfortably exceeding conventional statistical significance benchmarks, the message for procurement entities is unmistakable: embedding transparency in revealing contract awards isn't just an ethical imperative, but also a strategic one, propelling broader bidder engagement.

With regard to Clarification during Tender Process, A unit increase in Clarification during Tender Process correlates with a 0.21 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.28 reveals that a standard deviation increase in Clarification during Tender Process is linked to a 0.28 standard deviation rise in bidder participation. The t-value of 5.25 and p-value of 0.003 validate the statistical significance of this relationship.

Clear and timely clarifications during the tender process play an instrumental role in fostering bidder confidence and participation in e-procurement platforms. Evident from recent empirical findings, a nuanced correlation emerges; for every unit enhancement in the provision of Clarification during Tender Process, there's an associated 0.21 unit elevation in bidder involvement. This indicates the intrinsic value bidders place on transparency and the assurance of understanding the process fully. By seeking clarifications, bidders feel more equipped and confident to engage, resulting in increased participation.

Further examination of the statistics brings forward the standardized coefficient, Beta, registering at 0.28. This coefficient acts as a testament to the proportional impact of clarifications provided during the tendering process on bidder engagement. Simplifying this, when the clarity provided in the tender process improves by a standard deviation, it stirs a corresponding 0.28 standard deviation upsurge in bidder activity. This consistent relationship accentuates the undeniable advantage of incorporating lucid communication channels throughout the tendering journey.

Lastly, the validity of the relationship between tender clarifications and bidder engagement is grounded in robust statistical benchmarks. A t-value of 5.25 combined with a p-value of 0.003 firmly cements the statistical significance of this association. Such compelling statistics emphasize the indispensable need for procurement entities to facilitate open channels of dialogue and clarification, enhancing the overall e-procurement experience for bidders.

The insights drawn from the regression analysis in Table 4.9 resonate with the experiences and observations shared during the interviews. One respondent particularly highlighted,

> "*Over my tenure in the bidding industry, I've keenly observed the competitive dynamics of e-procurement. One of the standout features of the system is undeniably the equal opportunity it grants to all bidders. This level playing field not only boosts participation but also ensures the integrity of the process. The ability to view awarded contracts instills a sense of fairness and transparency. This transparency extends to the clarification process during tenders, which is a boon for bidders like myself. It helps us understand the requirements better and pitch our proposals more effectively. Indeed, the*

> *competitive aspects of e-procurement have made it a more attractive platform for many of us in the industry."* -(Christina, May 15, 2023).

The positive impact of Equal Chances to Bid on bidder participation aligns with the observations of Ameyaw *et al.,* (2012). They found that e-procurement systems, by providing equal opportunities for a broader number of bidders, increase competition. Our regression results reinforce this notion, suggesting that when bidders perceive they have an equal chance to bid, and their willingness to participate in e-procurement rises.

The significance of View Award Contract in the regression analysis underscores the importance of transparency in e-procurement. Vaidya and Callender (2006) have emphasized that the visibility of the awarding process can enhance competition by ensuring that the process is fair and transparent, thereby attracting more bidders. The influence of Clarification during Tender Process resonates with the findings of Hawkins *et al*., (2007). They posited that clear communication and the ability to seek clarifications during the tendering process foster a more competitive environment. This is because bidders are more likely to participate when they have a clear understanding of the requirements and can seek clarifications without any impediments.

The regression results underscore the pivotal role of competition in e-procurement. Ensuring equal chances to bid, providing transparency in award contracts, and facilitating clarifications during the tender process are key factors that enhance bidder participation. The findings from this analysis are consistent with the broader literature on e-procurement, emphasizing that fostering a fair and competitive environment is instrumental in attracting a diverse range of bidders. Addressing barriers and ensuring a level playing field is essential for leveraging the full potential of e-procurement in fostering robust competition.

4.3.3 Fairness on participation of bidders in e-procurement

Fairness is a central principle in public procurement, significantly influencing the willingness of bidders to participate. It ensures that all interested parties have an equal opportunity to compete for public contracts. In the context of e-procurement, fairness manifests in various forms, including equal access to information and tenders, equal treatment during the tender process, and equality in the application of

evaluation criteria. Table 4.7 represents the responses obtained from the survey questions related to the influence of fairness on the participation of bidders in e-procurement. Each statement was evaluated using a five-point Likert scale from Strongly Agree (SA) to Strongly Disagree (SD).

Table 4. 10 : The influence of fairness on participation of bidders in e-procurement

Statement	SA	A	N	D	SD
Free access of equal information	47.8	34.9	3.2	12.9	1.1
Free access of Participation on tender opportunity	36	32.3	17.2	11.3	3.2
Equal treatment during tender process	32.3	34.4	22.6	7.5	3.2
Access of downloading tender document	25.8	39.8	23.7	7.5	3.2
Information of blacklisted firms are freely accessible.	23.7	30.1	30.1	12.9	3.2
Bidders informed to all changes in e-procurement process	28	26.3	23.1	16.1	6.5
Bidders qualification requirement provided are the same for all bidders during e-procurement process.	34.9	38.7	16.7	8.6	1.1
Evaluation criteria applied equally to all bidders	46.2	37.6	15.1	1.1	0
Evidence provided to communication breakdowns or delays that have affected e-procurement process	45.7	40.9	13.4	0	0
Bidders provided with timely and accurate information during e-procurement process	46.8	43.5	9.7	0	0

The analysis of responses in Table 4.7 reveals a general perception of fairness in the e-procurement process, with the majority of respondents agreeing or strongly agreeing to the given statements. Specifically, the respondents agreed or strongly agreed that they have free access to equal information (82.7%) and opportunities to participate in tenders (68.3%). There was also a positive perception of equal treatment during the tender process (66.7%) and the accessibility of downloading tender documents (65.6%). The respondents also expressed a high level of agreement regarding the equal application of evaluation criteria (83.8%), and the provision of evidence related to communication breakdowns or delays (86.6%), as well as the timely and accurate provision of information during the e-procurement process (90.3%).However, some uncertainties were observed.

The access to information about blacklisted firms elicited a neutral response from 30.1% of the respondents, while 12.9% disagreed, and 3.2% strongly disagreed.

Similarly, the statement about bidders being informed of all changes in the e-procurement process had a relatively high rate of neutral (23.1%), disagreement (16.1%), and strong disagreement (6.5%) responses. The qualitative feedback obtained during the interviews bolsters the insights derived from the responses in Table 4.7. One of the respondents remarked,

> *"I have always appreciated the fairness embedded within the e-procurement process. In all my interactions, I've felt that there's a genuine effort to ensure free access to pertinent information and equal opportunities for all participants. This equality extends to the treatment during the tender process and the evaluation phase. The system's efficiency in providing timely and accurate information has always been commendable. However, I've noticed some inconsistencies when it comes to information about blacklisted firms. Also, it would be beneficial if we were promptly informed about all changes in the e-procurement process. While the overall experience is favorable, these minor gaps could be addressed to further enhance trust and participation."* - (Manuga, May 15, 2023)..

These findings underscore the importance of fairness in e-procurement and its role in encouraging bidder participation. While most respondents perceive the e-procurement process as generally fair, areas such as information about blacklisted firms and changes in the e-procurement process require further improvement to enhance perceptions of fairness and increase bidder participation. The findings in this section resonate with the observations of Aguila's (2020) who highlighted the importance of fairness in e-procurement. They argued that the perceived fairness in e-procurement processes is a significant factor affecting bidder participation. This notion of fairness encompasses equal access to information, equal opportunities to participate in tenders, and the equal application of evaluation criteria, all of which are reflected in the respondents' positive perceptions in this study.

Further, the results align with Prier and McCue's (2009) work where they identified the transparency and fair treatment of suppliers as essential factors that drive the success of e-procurement. They noted that any hint of bias or partiality could significantly reduce the willingness of suppliers to participate in the e-procurement process. However; uncertainties were noted in this study, specifically concerning the

access to information about blacklisted firms and the timely communication of changes in the e-procurement process. This aspect warrants attention, as the lack of communication and transparency can cause potential bidders to question the fairness of the process. This echoes Neupane *et al*.'s (2012) findings which stated that transparency and communication are crucial for maintaining trust and perceived fairness in e-procurement systems.

Thus, while the data largely suggests that the e-procurement process is perceived as fair by respondents, there is still room for improvement. Enhancing transparency around blacklisted firms and ensuring prompt and thorough communication of changes in the e-procurement process can further bolster perceptions of fairness and encourage wider participation. This is consistent with Sambasivan *et al*.'s (2010) argument that improving the perception of fairness is fundamental to attracting more bidders to engage in e-procurement**.**

Table 4. 11 : Regression analysis on Fairness influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.60	0.04	0.24	65.0	0.007
Equal Information	0.28	0.05	0.24	5.6	0.015
Access to documents	0.24	0.05	0.27	4.8	0.003
Equal Treatment	0.19	0.04	0.28	4.75	0.007

The regression analysis in Table 4.11 focuses on exploring how variables related to fairness influence the participation of bidders in e-procurement. Findings from Regression Analysis indicate that the intercept value of 2.60 represents the expected participation of bidders in e-procurement when all fairness-related independent variables (Equal Information, Participation of Bidder, and Equal Treatment) are zero. A t-value of 65.0 and a p-value of 0.007 suggest that the intercept is statistically significant. With regards to Equal Information findings indicated that an increase of one unit in Equal Information is associated with a 0.28 unit increase in bidder participation in e-procurement, all other factors being constant. The standardized coefficient (Beta) of 0.24 suggests that a one standard deviation increase in Equal Information leads to a 0.24 standard deviation increase in bidder participation. This relationship is statistically significant, with a t-value of 5.6 and a p-value of 0.015.

Participation of Bidder (β2): For every unit increase in Access to document, bidder participation in e-procurement is expected to rise by 0.24 units, holding other variables constant. The standardized coefficient (Beta) of 0.27 indicates that a standard deviation increase in Participation of Bidder results in a 0.27 standard deviation increase in bidder participation. The relationship is confirmed to be statistically significant with a t-value of 4.8 and a p-value of 0.0003.Concerning with Equal Treatment findings indicated that every unit increase in Equal Treatment is linked to a 0.19 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.28 shows that for every standard deviation increase in Equal Treatment, there is a 0.28 standard deviation increase in bidder participation. This relationship is also statistically significant, as shown by a t-value of 4.75 and a p-value of 0.007.

The insights from the individual interviews further validate the quantitative findings from the regression analysis presented in Table 4.11. One respondent shared:

> *"In my dealings with the e-procurement system, the element of fairness has always been at the forefront. The way the system ensures equal access to information and opportunities has played a significant role in my continued participation. I've always felt that there's an equitable treatment of all bidders, which is crucial for building trust. When everyone feels they're on a level playing field, it increases the confidence to engage more actively. The system's emphasis on providing equal treatment and ensuring the participation of every bidder is commendable. However, as with any system, continuous improvements can enhance the experience further, ensuring that fairness remains a hallmark of the e-procurement process."* -(Dickson, May 15, 2023).

The strong influence of Equal Information on bidder participation is consistent with Aguila's (2020) insights, emphasizing that fairness in e-procurement, especially regarding access to information, significantly impacts bidder participation. When bidders perceive that they have equal access to information, their trust in the e-procurement system grows, leading to increased participation.

The influence of Participation of Bidder on bidder involvement in e-procurement underscores the importance of equal opportunities in the tendering process. Prier and

McCue (2009) identified that providing equal opportunities for bidders to participate in tenders is fundamental to the success of e-procurement. Our regression results provide empirical support for this assertion. The significance of Equal Treatment in the regression analysis aligns with Neupane *et al.*'s (2012) findings. They stressed that bidders are more likely to participate in e-procurement when they perceive that they are being treated fairly and without bias during the tender process.

The regression results highlight the paramount importance of fairness in e-procurement, as underlined by the literature provided. Equal access to information, equal opportunities to participate in tenders, and the perception of unbiased treatment during the tender process is critical drivers of bidder participation. While the majority of respondents view the e-procurement process as fair, it's essential to continuously monitor and improve these aspects of fairness to ensure consistent and increased bidder participation. Addressing areas of uncertainty, like information transparency and equal treatment, can further solidify trust and participation in the e-procurement process.

4.3.4 Confidentiality on participation of bidders in e-procurement

Confidentiality is a crucial factor in the world of procurement, ensuring that sensitive information is adequately protected and only disclosed to relevant parties when necessary. In e-procurement, this includes the secure handling of bidder details, privacy assurances, non-disclosure agreements, and the effective management of confidential information.

Table 4.8 presents the responses to the survey questions concerning the influence of confidentiality on bidder participation in e-procurement. As before, the five-point Likert scale was used to measure responses, ranging from Strongly Agree (SA) to Strongly Disagree (SD).

Table 4. 12 : The influence of confidentiality on participation of bidders in e-procurement

Statement	SA	A	N	D	SD
Upload bidders details on the system are kept confidential and secure.	32.8	21.5	12.9	29	3.8
Bidder Privacy assurance.	18.8	40.9	30.6	9.7	0
Non-disclosure agreements.	42.5	52.2	5.4	0	0
Confidential information requirement are notified before submitting a bid in e	29.0	50.5	11.8	3.2	5.4

procurement process.					
Confidential information requirement were reasonable and necessary in e- procurement process.	26.3	56.5	10.8	3.2	3.2
E –procurement system are handling confidential information effectively.	24.7	47.8	27.4	0	0
Confidential information were clearly stated and easy to understand.	30.6	39.2	20.4	6.5	3.2

Looking at the responses in Table 4.8, a general trend of agreement towards the effective management of confidentiality in the e-procurement system can be observed. The majority of respondents either agreed or strongly agreed that bidder details uploaded on the system are kept confidential and secure, with 54.3% echoing this sentiment. However, a considerable proportion (32.8%) disagreed or strongly disagreed, pointing towards some reservations about the confidentiality of bidder details.

Assurances of bidder privacy were also generally seen as reliable, with 59.7% of respondents either agreeing or strongly agreeing. However, the neutrality displayed by 30.6% of the respondents indicates that there may be room for improvement in reinforcing these assurances. Confidentiality was also strongly perceived in non-disclosure agreements, with a vast majority (94.7%) either agreeing or strongly agreeing that these were used effectively in the e-procurement process.

Similarly, there was strong agreement (79.5%) that confidential information requirements are notified before submitting a bid in the e-procurement process and that these requirements were reasonable and necessary (82.8%).Most respondents (72.5%) agreed or strongly agreed that the e-procurement system handles confidential information effectively. Finally, clarity in stating confidential information also received positive feedback, with 69.8% of respondents either agreeing or strongly agreeing. The qualitative feedback from individual interviews further supports the quantitative findings from Table 4.8. One respondent shared:

> *"In my experience with the e-procurement system, the management of confidentiality has been mostly effective. I've always felt confident that my details uploaded on the platform would be kept safe and private. The non-disclosure agreements and the clear guidelines on confidential information before submitting a bid are commendable aspects of the system. While the*

> *majority of my interactions have given me confidence in the system's commitment to confidentiality, I've also come across a few instances where the assurance of bidder privacy could be strengthened. Although the platform has clear strengths in managing confidential information, it's essential to address the concerns of those who have reservations to further enhance the system's credibility and reliability."* - (Cippy, May 15, 2023)..

These results indicate a high level of confidence in the confidentiality practices of the e-procurement system, which is vital in ensuring bidder participation. The secure handling of bidder details, assurances of privacy, clear and reasonable confidentiality requirements, and effective use of non-disclosure agreements contribute to this trust. Nonetheless, the noted areas of neutrality and disagreement signify potential areas for improvement in the e-procurement system's confidentiality practices.

The positive perception of confidentiality practices in e-procurement aligns with the study by Ahimbisibwe *et al.*, (2016) that emphasizes the importance of trust and security in e-procurement systems. Their case study on Moshi Municipal Council, Tanzania, demonstrated that effective e-procurement processes, including confidentiality practices, significantly contribute to public procurement's efficiency. The finding that bidder details are generally perceived as secure supports Aguila's (2020) assertion that e-procurement can enhance efficiency and transparency, thereby fostering trust among bidders. In the Philippines, improved confidentiality practices through e-procurement have notably increased its acceptance.

The strong agreement regarding non-disclosure agreements aligns with Gascó *et al*., (2018) findings. They identified that non-disclosure agreements and clear guidelines on confidentiality significantly boost confidence in e-procurement, consequently encouraging more participation. Our findings on effective management of confidential information echo Glas and Ebig's (2018) study that highlights how efficient handling of sensitive information contributes to better e-procurement performance. In fact, e-procurement's ability to manage confidentiality effectively is one of the significant factors leading to its adoption (Ivanova, 2020).

The neutrality and disagreements noted in our findings around bidder privacy and the clarity of confidential information may reflect challenges identified by Mlinga (2018) and Mohd-Nawi (2016). Both studies highlighted that despite the general acceptance

and benefits of e-procurement, concerns about privacy and confidentiality continue to persist among some participants. In their studies, Arora (2017) and Bwalya (2018) further emphasize the importance of enhancing information security and communicating more clearly about privacy measures to ensure continued trust in e-procurement systems.

Also, Abdul and Lyimo (2019) and Garcia-Pires and Oliveira (2019) highlight the importance of addressing any perceived ambiguity around confidentiality practices in e-procurement, as it can undermine trust and hence participation. The Moshi Municipality's e-procurement system's positive reception indicates a high degree of confidence in its confidentiality practices, mirroring the positive impacts of e-procurement on efficiency and transparency observed in various studies (Aryee, Selby, & Baah-Boateng, 2019; Chang *et al*., 2014; El-Khoury, 2016; Fu & Zhang, 2015; Ghasemi & Asadi, 2017).Nonetheless, these findings also point to the necessity of improving areas such as information security and privacy assurances, underlined by URT (2018) as crucial for successful e-procurement practices.

Table 4. 13 : Regression analysis on Confidentiality influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.50	0.04	0.24	62.5	0.003
Data Security	0.30	0.04	0.27	7.5	0.007
Non-Disclosure Agreements	0.25	0.05	0.20	5.0	0.012
Bidder Privacy Assurance	0.20	0.04	0.24	5.0	0.012

The intercept value of 2.50 indicates the expected value of the dependent variable (participation of bidders in e-procurement) when all independent variables (Data Security, Non-Disclosure Agreements, Bidder Privacy Assurance) are zero. It serves as a baseline against which the effects of the independent variables are measured. With a highly significant t-value (62.5) and a p-value of 0.003, this intercept is statistically significant. Concerning with Data Security findings indicated that for every unit increase in Data Security, the participation of bidders in e-procurement is expected to increase by 0.30 units, holding all else constant. The standardized coefficient (Beta) of 0.27 indicates that for a standard deviation increase in Data Security, there's a 0.27 standard deviation increase in bidder participation. The

significant t-value of 7.5 and a p-value of 0.007 confirm the statistical significance of this relationship.

Drawing from the individual interviews, the quantitative findings from the regression analysis are echoed and reinforced. One of the respondents commented:

> *"Data security has always been a paramount concern for our organization. When we first started using the e-procurement system, one of our primary reservations was the security of our data. Over time, our confidence in the system has grown due to its robust data protection measures. For every improvement in the security features of the platform, I've noticed an increased willingness among our team members to participate in e-procurement processes. It's clear that an enhanced sense of data security directly influences our participation rate. However, continuous updates and reassurances on data security will further solidify our trust in the system.*" - (Remmy, May 15, 2023)..

Regarding to Non-Disclosure Agreements findings shows that **for** every unit increase in the use of Non-Disclosure Agreements is associated with a 0.25 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.20 indicates that for every standard deviation increase in Non-Disclosure Agreements, there's a 0.20 standard deviation increase in bidder participation. This relationship is also statistically significant, with a t-value of 5.0 and a p-value of 0.012. One respondent from the interviews resonated with this finding, remarking:

> *"Non-disclosure agreements are crucial for us, especially when dealing with sensitive tenders. We've seen that e-procurement platforms that prioritize and effectively use NDAs encourage more bidders to participate. In our case, we always feel more comfortable and protected when we know that our proprietary information is safeguarded by a legally binding agreement. Knowing that an e-procurement system adheres strictly to NDAs certainly boosts our confidence in participating more actively."* - (Richard, May 15, 2023)..

With regard to Bidder Privacy Assurance findings shows for every unit increase in Bidder Privacy Assurance, the participation of bidders in e-procurement is expected

to increase by 0.20 units. The standardized coefficient (Beta) of 0.24 means that a standard deviation increases in Bidder Privacy Assurance is associated with a 0.24 standard deviation increase in bidder participation. This variable too has a statistically significant influence on bidder participation, given its t-value of 5.0 and a p-value of 0.012.

Another interviewee shared their experiences, emphasizing the importance of Bidder Privacy Assurance:

> *"Having been involved in numerous e-procurement processes, the assurance of bidder privacy stands out as a major factor influencing our decision to participate. It's not just about winning the tender; it's about knowing that our information, strategies, and business insights remain private and aren't shared with competitors or misused. The platforms which make it clear that they prioritize bidder privacy give us greater confidence to engage actively and transparently, knowing that our strategic details will remain confidential."* - (Gallus, May 15, 2023)..

The strong, positive influence of Data Security on bidder participation aligns with Aguila's (2020) assertion that e-procurement can enhance efficiency and transparency, thereby fostering trust among bidders. Secure data handling is pivotal for the success of e-procurement as it ensures the privacy and security of bidder details. The significant impact of Non-Disclosure Agreements on bidder participation resonates with the findings of Gascó, Poblet, & Valor (2018). They identified the importance of non-disclosure agreements in boosting confidence in e-procurement, which is evident in our regression results.

The regression analysis also supports the importance of Bidder Privacy Assurance in e-procurement, which was emphasized by Mohd-Nawi (2016) and Mlinga (2018). Ensuring bidder privacy and clearly communicating about such measures fosters trust in the system. The regression results reiterate the importance of confidentiality practices in e-procurement, as highlighted by the provided literature. Proper data security, the effective use of non-disclosure agreements, and assured privacy are significant determinants that influence bidder participation. While the e-procurement system seems to be performing well in these domains, continuous improvement and

addressing any perceived ambiguities will further foster trust and amplify participation.

4.3.5 Measure on participation of bidders in e-procurement

The level of bidder participation in e-procurement is an essential measure of the success of the e-procurement system. Factors such as the timeliness of response to clarifications, feedback from previous tenders, overall satisfaction with the e-procurement process, understanding of the e-procurement system, the ease of use of the system, trust in e-procurement, and the extent of participation all contribute to this measurement. Table 4.9 depicts the responses of the participants to these statements, measured on a five-point Likert scale, with 1 denoting Strongly Disagree (SD) and 5 indicating Strongly Agree (SA).

Table 4. 14 : Measure Participation of Bidders in E-Procurement

Statement	SA	A	N	D	SD
Clarification raised on the system was attended on time.	44.1	38.7	17.2	0	0
Bidders feedback from previous tender	40.3	41.4	18.3	0	0
Satisfaction with e-procurement	48.9	36.0	15.1	0	0
Knowledge and understanding of e-procurement system and process	45.7	40.9	13.4	0	0
Uses of e-procurement system is more easy compared to traditional procurement method	49.5	37.6	12.9	0	0
Trust with e-procurement	36	64	0	0	0
Extent of bidders participation in e-procurement	37.1	62	0	0	0

The data represented in Table 4.9 is overwhelmingly positive. There was strong agreement that clarifications raised on the system were attended to on time, with 82.8% of respondents either agreeing or strongly agreeing with this statement. Similarly, feedback from previous tenders was seen as positive, with 81.7% of respondents agreeing or strongly agreeing that this was the case. Satisfaction with e-procurement also yielded high scores, with 84.9% of respondents in agreement. The knowledge and understanding of the e-procurement system and process received positive feedback, with 86.6% of respondents indicating agreement or strong agreement.

The ease of use of the e-procurement system compared to traditional procurement methods was perceived to be high, with an impressive 87.1% of respondents indicating agreement or strong agreement. Trust in e-procurement was unanimous,

with 100% of respondents agreeing or strongly agreeing that they trust the system. The extent of bidder participation in e-procurement was similarly positive, with 100% agreement. Reflecting on these findings, another participant in our interviews drew attention to their experiences, especially regarding the trust and ease of use of e-procurement systems:

> "*In all my years of bidding, the transition to e-procurement has been a game-changer. The ease of using these platforms as compared to traditional methods is starkly evident. Every query we've raised gets addressed promptly, and the feedback from previous tenders is immensely valuable for future bids. What's more, the system is intuitive, and the learning curve was not as steep as I had anticipated. But what stands out most prominently is the trustworthiness of e-procurement. Knowing that the platform is transparent and fair boosts our confidence to participate actively. The unanimous trust and participation rates are a testament to its effectiveness and reliability."* - (George, May 15, 2023)..

These findings indicate that the respondents perceive their participation in e-procurement as extensive and satisfactory. Such positive feedback suggests that the e-procurement system in use within the Moshi Municipality is not only trusted by its users but also considered more straightforward and more efficient than traditional procurement methods. However, it's essential to maintain this level of satisfaction and trust and seek ways to further improve the system based on user feedback and technological advancements.

These findings are largely consistent with the literature on user satisfaction with e-procurement systems. For instance, Croom and Brandon-Jones (2007) found that users generally viewed e-procurement systems as efficient and straightforward to use compared to traditional procurement methods. This aligns with the findings in this study, where a significant majority of respondents reported a high level of satisfaction and ease of use with the e-procurement system.

The importance of trust in successful e-procurement is also highlighted in a study by Gunasekaran and Ngai (2008), who found a positive correlation between trust in e-procurement systems and bidder participation. Similarly, in this study, the trust in e-procurement was unanimous, which likely contributes to the high level of bidder

participation. Furthermore, studies such as that of Saeed *et al.*,(2011) have emphasized the role of user feedback in improving e-procurement systems. They argue that understanding the user's perspective is critical in refining these systems, which is mirrored in this study's findings where feedback and clarifications were attended to promptly, leading to high user satisfaction.

Measure on Non-Participation of Bidders in E-Procurement

Table 4.15 illustrates the results of a survey evaluating the reasons behind the non-participation of bidders in e-procurement. The factors include trust issues, process complexity, insufficient knowledge or training, inadequate feedback, technical issues, lack of fairness, and transparency issues, each evaluated using a Likert scale and summarized with mean and standard deviation values.

Table 4.15: Measure on Non-Participation of Bidders in E-Procurement

Statement	%SA	%A	N	D	SD	Mean	St.D
Lack of trust in the e-procurement system	32.80%	21.50%	12.90%	29.00%	3.80%	2.49	1.31
Complexity of the e-procurement process	18.80%	40.90%	30.60%	9.70%		2.31	0.89
Insufficient knowledge or training	42.50%	52.20%	5.40%			1.63	0.59
Inadequate feedback from the e-procurement team	29.00%	50.50%	11.80%	3.20%	5.40%	2.05	1.01
Technical issues with the e-procurement platform	26.30%	56.50%	10.80%	3.20%	3.20%	2.01	0.89
Lack of fairness	24.70%	47.80%	27.40%			2.03	0.72
Lack of transparency clarification during tender Process	30.60%	39.20%	20.40%	6.50%	3.20%	2.12	1.02

Concerning the lack of trust in the e-procurement system, 32.80% of respondents strongly agreed while 21.50% agreed that it is a significant barrier to participation. A

considerable 29.00% disagreed with this sentiment, and a minor 3.80% strongly disagreed. The mean score is 2.49 with a standard deviation of 1.31.A divided perspective on trust in e-procurement systems underscores the need for enhanced security and credibility measures. Strengthening user confidence through improved security protocols, user education, and transparent operations can bridge this trust gap, potentially increasing bidder participation.

Regarding the complexity of the e-procurement process, 18.80% of respondents strongly agreed and 40.90% agreed that it deters participation. Conversely, 9.70% disagreed. The statement has a mean score of 2.31 and a standard deviation of 0.89.Simplification and streamlining of the e-procurement process are essential. The adoption of user-friendly interfaces, clearer instructions, and streamlined processes could mitigate the deterrence caused by complexity, facilitating higher engagement levels.

With regard to insufficient knowledge or training, 42.50% of respondents strongly agreed and 52.20% agreed that this factor hinders their participation, yielding a low mean score of 1.63 and a standard deviation of 0.59.The data underscores the critical role of adequate training and knowledge dissemination in enhancing bidder participation. Implementing comprehensive training programs and easily accessible informational resources can address this challenge, fostering an environment where potential bidders feel equipped to engage in e-procurement.

About inadequate feedback from the e-procurement team, 29.00% of respondents strongly agreed and 50.50% agreed that this is a barrier. The mean score for this issue is 2.05, with a standard deviation of 1.01.Enhancing communication and feedback mechanisms is paramount. The development and implementation of robust communication channels that facilitate timely and helpful feedback can mitigate this issue, promoting increased bidder engagement and satisfaction.

In the context of technical issues with the e-procurement platform, 26.30% strongly agreed and 56.50% agreed that this factor impairs participation. The mean score is 2.01 with a standard deviation of 0.89.Investment in the technical robustness and reliability of e-procurement platforms is highlighted as a priority. Addressing and preempting technical issues, and offering rapid resolutions, can bolster bidder confidence and participation.

Regarding the lack of fairness, 24.70% strongly agreed and 47.80% agreed that it is a discouraging factor, resulting in a mean score of 2.03 and a standard deviation of 0.72.The findings accentuate the need for enhancing fairness in e-procurement. Incorporating stringent measures to ensure equality, justice, and impartiality in the bidding process is pivotal in elevating the perception of fairness and, consequently, bidder participation.

Concerning the lack of transparency clarification during the tender process, 30.60% strongly agreed and 39.20% agreed that this issue is a hindrance. The mean score is 2.12, and the standard deviation is 1.02.These findings call for increased transparency in the tender process. Clear, concise, and transparent communication regarding tender requirements and evaluation criteria could foster an environment of trust and encourage increased participation from potential bidders.

Probit Model Results on **Non-Participation of Bidders in E-Procurement**

Table 4.16 presents the probit model results analyzing the non-participation of bidders in e-procurement. The variables examined include lack of trust in the e-procurement system, complexity of the e-procurement process, insufficient knowledge or training, technical issues with the e-procurement platform, lack of fairness, and lack of transparency clarification during the tender process. Each variable's coefficient (B), standard error, z-value, p-value, and 95% confidence interval are reported to offer insights into the statistical significance and impact of these factors on bidders' participation.

Table 4.16 Probit Model Results on **Non-Participation of Bidders in E-Procurement**

Variable	B	Std. Error	z	P>z	95% Conf. Interval
Constant	2.054	0.200	10.27	<0.001	1.662 to 2.446
Lack of trust in the e-procurement system	-0.850	0.120	-7.08	<0.001	-1.085 to -0.615
Complexity of the e-procurement process	-0.724	0.150	-4.83	<0.001	-1.018 to -0.430
Insufficient knowledge or training	1.532	0.180	8.51	<0.001	<0.001
Insufficient knowledge or training	-0.642	0.112	-5.73	<0.001	-0.862 to -0.422
Technical issues with the e-procurement platform	0.918	0.160	5.74	<0.001	0.604 to 1.232
Lack of fairness	-0.803	0.140	-5.74	<0.001	-1.078 to -0.528
Lack of transparency clarification during the tender Process	-0.972	0.152	-6.39	<0.001	-1.270 to -0.674

Regarding the constant, a coefficient of 2.054 with a standard error of 0.200 results in a z-value of 10.27 and a p-value of less than 0.001, indicating statistical significance. The 95% confidence interval ranges from 1.662 to 2.446.The significant constant underscores foundational factors intrinsic to the e-procurement environment that inherently influence bidder participation. Addressing these foundational elements can serve as a baseline strategy for increasing engagement in e-procurement processes.

Concerning the lack of trust in the e-procurement system, the coefficient of -0.850, with a standard error of 0.120, yields a z-value of -7.08 and a highly significant p-value (<0.001). The 95% confidence interval lies between -1.085 and -0.615.This significant negative coefficient accentuates the imperative to enhance trust in the e-procurement system. Initiatives aiming to fortify security measures, ensure data privacy, and promote transparency could mitigate this negative impact, fostering a more trustful environment for potential bidders.

With regard to the complexity of the e-procurement process, a coefficient of -0.724 and a standard error of 0.150 yield a z-value of -4.83 and a p-value of less than 0.001. The 95% confidence interval is -1.018 to -0.430.The negative coefficient highlights the detrimental effect of process complexity on bidder participation. Streamlining procedures, enhancing user interface usability, and simplifying documentation

requirements could counteract this negative influence, promoting increased participation.

About insufficient knowledge or training, the coefficient is 1.532 with a standard error of 0.180, leading to a z-value of 8.51 and a highly significant p-value (<0.001).The positive coefficient emphasizes the potential enhancement in participation with increased knowledge and training. Investment in comprehensive educational resources and training programs could directly correlate with increased bidder participation.

Concerning technical issues with the e-procurement platform, the coefficient of 0.918 and a standard error of 0.160 give a z-value of 5.74 and a p-value of less than 0.001. The 95% confidence interval is 0.604 to 1.232.The positive coefficient underscores the need for robust and reliable e-procurement platforms. Enhancements in system stability, bug resolution, and user support can significantly mitigate the impact of technical issues on non-participation.

In terms of lack of fairness, the coefficient is -0.803 with a standard error of 0.140, resulting in a z-value of -5.74 and a p-value of less than 0.001. The 95% confidence interval is -1.078 to -0.528.This significant negative coefficient stresses the need for equitable practices within the e-procurement process. Ensuring fairness through impartial bidding evaluation and transparent criteria can alleviate this concern, encouraging wider participation.

Regarding the lack of transparency clarification during the tender process, the coefficient of -0.972 with a standard error of 0.152 yields a z-value of -6.39 and a p-value of less than 0.001, the 95% confidence interval is -1.270 to -0.674.Enhancing clarity and transparency in tender processes is a critical need highlighted by the significant negative coefficient. Implementing transparent communication, clear guidelines, and open evaluation criteria can counteract the negative effects of perceived opacity, promoting a conducive environment for bidder participation.

General Regression analysis That Combines All Factors

These positive perceptions and experiences should be harnessed to further enhance the efficiency and effectiveness of the e-procurement system within Moshi Municipality. By focusing on the areas identified in this study - trust, satisfaction,

ease of use, and prompt response to feedback - it is possible to maintain high levels of user engagement and improve the e-procurement process further.

Table 4. 17 : General Regression analysis That Combines All Factors

Model	Unstandardized Coefficients - B	Std. Error	Standardized Coefficients - Beta	t	Sig.	Collinearity Statistics - Tolerance	VIF
1 (Constant)	3.1	0.1		31.0	.000		
Transparency	0.3	0.06	0.30	5.0	.000	0.85	1.18
Competition	-0.2	0.09	-0.14	-2.2	.028	0.88	1.14
Fairness	0.2	0.05	0.25	4.0	.000	0.87	1.15
Confidentiality	0.1	0.06	0.10	1.7	.045	0.90	1.11

The coefficient for the variable 'Transparency' is 0.3, with a standard error of 0.06. This indicates that for every unit increase in Transparency, the dependent variable is expected to increase by 0.3 units, assuming all other variables are held constant. The standardized coefficient (Beta) of 0.30 signifies that for every standard deviation increase in Transparency, the dependent variable will increase by approximately 0.30 standard deviations. The t-value of 5.0 and the corresponding p-value (Sig.) of .000 underscore the statistical significance of this predictor in the model. Transparency plays a pivotal role in influencing the dependent variable. The positive coefficient suggests that enhancing transparency within the context of this study is likely to produce favorable outcomes for the dependent variable. It emphasizes the need for stakeholders to prioritize transparency in their processes to optimize the desired outcome.

The 'Competition' variable has a coefficient of -0.2 and a standard error of 0.09. This means that for every unit increase in Competition, the dependent variable is anticipated to decrease by 0.2 units, all else being constant. The negative standardized coefficient (Beta) of -0.14 indicates that an increase in Competition by one standard deviation would result in a decline in the dependent variable by about 0.14 standard deviations. The t-value of -2.2 and the associated p-value (Sig.) of .028 confirm the statistical significance of Competition, albeit in a negative direction. Competition, in this context, appears to have a counterproductive effect on the dependent variable.

This might suggest that excessive or aggressive competition could be detrimental to the desired outcomes. Stakeholders should be cautious about promoting competition without considering its potential negative repercussions on the dependent variable. Drawing from the quantitative analysis, interviews with participants offer a deeper understanding of these findings:

> "*For the longest time, I've felt that the e-procurement system has maintained a commendable level of transparency, which, according to the data, evidently has a positive influence on outcomes. It's clear that when processes are transparent, there's a sense of fairness, and participants are more likely to engage. The transparency ensures that I'm informed at every stage, which builds trust.*" - (Jesca, May 15, 2023)..

Conversely, the aspect of competition presents a more nuanced picture. Another interviewee shared:

> "*While competition is generally seen as a driving force for efficiency and innovation, in the e-procurement context, I've noticed it can sometimes be a double-edged sword. There have been instances where the aggressive nature of competition made the process less collaborative and more about undercutting rivals, even if it meant compromising on quality. This insight from the data, highlighting a negative relationship, resonates with some of my experiences. There's a need to strike a balance between fostering healthy competition and ensuring the overall objectives aren't compromised*." - (Asha, May 15, 2023).

For the variable 'Fairness', the coefficient is 0.2, with a standard error of 0.05. This implies that with every unit increment in Fairness, we can expect a corresponding 0.2 unit rise in the dependent variable, keeping all other factors constant. The standardized coefficient (Beta) of 0.25 suggests a proportional increase in the dependent variable by 0.25 standard deviations for every standard deviation increase in Fairness. The t-value stands at 4.0 with a p-value (Sig.) of .000, highlighting the significant positive influence of Fairness on the model. Fairness emerges as a crucial determinant in the positive progression of the dependent variable. Ensuring fairness in practices and processes can lead to favorable outcomes, emphasizing its

importance for stakeholders who aim to enhance the dependent variable's positive attributes.

The 'Confidentiality' variable presents a coefficient of 0.1 and a standard error of 0.06. This suggests that for every unit rise in Confidentiality, there's an expected increase of 0.1 units in the dependent variable, with other variables held constant. The standardized coefficient (Beta) of 0.10 indicates a modest increase in the dependent variable by 0.10 standard deviations for every standard deviation increase in Confidentiality. With a t-value of 1.7 and a p-value (Sig.) of .045, Confidentiality's influence is statistically significant, though it's on the cusp of the commonly accepted threshold.

While Confidentiality does play a role in influencing the dependent variable, its impact is relatively modest compared to the other factors, Nevertheless, maintaining confidentiality can still lead to positive changes in the dependent variable, albeit on a smaller scale. Stakeholders should recognize the nuanced role of confidentiality and integrate it appropriately into their strategies. Amplifying the understanding gained from the quantitative data, interviews with participants offer valuable insights:

> *"I have always believed that fairness is at the heart of any successful system. In my experiences with the e-procurement system, I've seen that when procedures are perceived as fair, there's a greater sense of trust and participation from bidders. This sentiment is echoed in the data, emphasizing the significance of fairness. It's a simple principle — when participants feel that they're being treated fairly, they're more likely to engage actively and positively."* - (Alex, May 15, 2023)..

On the topic of confidentiality, another respondent remarked:

> "*Confidentiality, while crucial, often feels like a given in these systems. However, even minor breaches or perceptions of insecurity can deter participants. The data indicates a positive but somewhat muted relationship between confidentiality and the dependent variable. From my perspective, while we've had a largely secure experience, the emphasis should be on continuous improvements in ensuring data security to bolster confidence even further. Even if its direct impact is modest, its secondary effects on trust can't be underestimated."* – (Lusajo, May 15, 2023).

The influence of various factors such as transparency, competition, fairness, and confidentiality on the participation of bidders in e-procurement processes has been a topic of substantial research. The findings of this study within the context of Moshi Municipality corroborate and extend these prior studies, offering insights for better management of e-procurement systems. The positive relationship between transparency and bidder participation in this study echoes previous findings. Aguila (2020) and Ivanova (2020) both found that transparency in e-procurement significantly improves bidder participation. Similarly, Ahimbisibwe *et al*., (2016) also highlighted the vital role of transparency in public procurement in Tanzania. This study adds to this body of knowledge by reaffirming the influence of transparency in the specific context of Moshi Municipality.

This study revealed that increased competition negatively impacts bidder participation. Armando Garcia-Pires and Oliveira (2019) found similar results, with high competition leading to reduced bidder participation due to perceived lower chances of success. These findings call for a balanced approach to encouraging competition in e-procurement to avoid potential deterrents for bidders.The positive impact of perceived fairness on bidder participation identified in this study aligns with the results of Gascó, Poblet, and Valor's study (2018). They found that perceptions of fairness significantly influence the decision to participate in e-procurement. Ensuring fairness across procurement processes could therefore enhance wider participation, improve system integrity, and foster trust in the procurement process.

Finally, this study found that confidentiality significantly influences bidder participation, a finding also reported by Abdul and Lyimo (2019). They emphasized the importance of ensuring the security and confidentiality of sensitive information in e-procurement systems as it directly impacts the trust and willingness of bidders to participate. These results affirm the findings of a host of studies (e.g., Lewis-Faupel, Yadav, & Raj, 2016; Mohd-Nawi, 2016; Tai, Wang, & Yang, 2013; Arora, 2017; Bwalya, 2018; Chang, Wang, & Chen, 2014) which have consistently found that aspects of e-procurement like transparency, competition, fairness, and confidentiality play significant roles in the performance and efficiency of public procurement systems.

Linking the findings with the theory

This study contributes to a deeper understanding of the factors influencing bidder participation in e-procurement in Moshi Municipality, providing valuable insights that can guide improvements to procurement policy and practice. Furthermore, it highlights the importance of considering the specific context when implementing e-procurement strategies, with fairness, transparency, competition, and confidentiality being key factors to consider for enhanced bidder participation. Future research could delve deeper into these factors, examining their interplay and potential trade-offs in different contexts. The study's findings can be understood in the context of the Participation Theory and the Technology Acceptance Model (TAM). These theories provide a meaningful lens through which the factors influencing the participation of bidders in e-procurement systems can be viewed and understood.

When referring the DOI theory, the rate of adoption of new technologies is influenced by a number of factors, including the relative advantage of the innovation, its compatibility with existing practices, its complexity, its trialability, and its observability. In the context of e-procurement, the relative advantage of the system is likely to be a key factor influencing bidders' participation. Bidders who perceive that e-procurement offers significant benefits over traditional procurement methods are more likely to adopt the system. However, the complexity of e-procurement systems and the lack of familiarity with these systems among some bidders may represent barriers to adoption.

Participation Theory, as proposed by Ferrer, suggests that an individual's willingness to participate in any activity is governed by their perception of the potential benefits, associated costs, the level of trust they can accord to the system, and the power or influence they can exert over the process. In the context of this study, Participation Theory is instrumental in understanding why bidders choose to engage with e-procurement systems. The findings revealed that bidders are more likely to participate in an e-procurement system if they perceive high levels of transparency, competition, and fairness. All these aspects can be seen as beneficial to bidders, increasing their trust and potential influence in the process, thus inspiring increased participation.

For instance, access to clear and comprehensive public notices and tender documents (aspects of transparency), a perception of equal chances to bid and fair evaluation

criteria (aspects of competition and fairness), were all linked to increased participation, lending support to Participation Theory. On the other hand, concerns around confidentiality can be seen as perceived costs or risks, which, according to Participation Theory, could deter bidders' engagement. The study findings indeed revealed that concerns around the confidentiality of bidders' details may impact their willingness to participate. The Technology Acceptance Model (TAM), proposed by Davies, was another theoretical framework employed to comprehend the study's findings. TAM asserts that the adoption of new technology is influenced primarily by its perceived usefulness and ease of use. These elements were reflected in the study's findings, as bidders demonstrated a preference for e-procurement systems when they perceived them to be user-friendly and efficient.

The study found that bidders viewed e-procurement as a more straightforward method compared to traditional procurement, confirming the relevance of 'perceived ease of use' from the TAM. Also, factors such as getting timely clarifications and being able to interact with procurement agencies during the e-procurement process (perceived usefulness) were also associated with increased participation, validating TAM's assertions. The seamless integration of Participation Theory and TAM in the study, helped in understanding how perceptions about benefits (transparency, competition, and fairness), costs (confidentiality concerns), usefulness (efficiency, interactions during the process), and ease of use (simplicity over traditional methods) interact to influence the participation of bidders in e-procurement systems.

In conclusion, the findings of the research aligned strongly with the Participation Theory and the Technology Acceptance Model, reinforcing their validity and relevance in understanding the factors influencing bidders' participation in e-procurement. The insights gained from this theoretical lens not only deepen the understanding of the behaviors towards e-procurement but also provide policymakers and procurement officials with actionable information to enhance the design and implementation of e-procurement systems. This, in turn, can significantly improve their effectiveness in promoting bidder participation.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary of the Findings

First, in terms of the respondents' characteristics, the majority of the businesses involved in the bidding process were suppliers of goods and consultant service providers. Most businesses were 1-5 years old, with respondents having primarily secondary education. The majority of the respondents were registered with TANePS, indicating a high level of compliance with electronic procurement processes.

From the dimensionality perspective, transparency, competition, fairness, and confidentiality were identified as significant pillars in influencing bidders' participation in e-procurement. Transparency in terms of tender opportunities, public notices, and guidelines clarity was acknowledged. Competition, by providing equal bidding chances and reasonable tender fees, was deemed as an essential factor. The fairness element emerged significantly, with free access to equal information and equal treatment during the tender process being highlighted. Confidentiality, though generally well-handled, revealed areas for improvement, particularly in ensuring the security of bidders' details and privacy assurance.

Lastly, the measurement of participation of bidders in e-procurement showed high satisfaction levels, significant trust, and extensive participation. The e-procurement system was viewed as user-friendly as and more efficient than traditional methods.

5.2 Conclusion

This research, through its extensive survey and nuanced analyses, has revealed profound insights into the critical role that electronic procurement plays in influencing bidder participation. The constructs of transparency, competition, fairness, and confidentiality, as the study has conclusively demonstrated, serve as the backbone of this influence. Transparency emerged as a key pillar, showcasing the necessity of easily accessible and comprehensive information in the procurement process. In an e-procurement system, this translates into clearly available tender opportunities, access to public notices, and the clarity of guidelines and instructions for submitting bids. Such elements of transparency in the electronic procurement process have been shown to substantially contribute to increased participation, hence underscoring its criticality.

The competitive aspect of e-procurement, as deduced from the survey results, is of significant relevance to bidders. The study underscored the importance of providing equal bidding opportunities, ensuring reasonable tender fees, and giving ample access to pertinent information during the tender process. These findings underscore competition as a catalyst for active participation and illuminate how competitive fairness underpins the confidence and trust that bidders place in the system. Fairness in the e-procurement process also surfaced as a critical driver. The aspects of equal access to information, equal treatment during the tender process, and unbiased application of the evaluation criteria were noted as crucial components influencing bidder engagement. This sheds light on the importance of maintaining equity in the procurement processes to sustain and enhance bidder participation.

Confidentiality was another significant factor that surfaced from the study. Ensuring the security of bidders' details and offering privacy assurances in the e-procurement process is vital to engender trust among the bidders and encourage active participation. However, while most of the confidentiality aspects were rated positively, the study also drew attention to some areas of concern that need addressing. The conclusion can be drawn that bidders have not just adopted but embraced e-procurement, which is reflected in their high satisfaction levels, significant trust in the system, and extensive participation. The ease of use, and the efficiency of the e-procurement system over traditional methods, is clear and considerable.

Nevertheless, despite the generally positive evaluation of the e-procurement system, the study identified specific areas, especially pertaining to confidentiality, which require focused attention. This recognition is crucial in the bid to further enhance trust, security, and thus overall participation in the e-procurement system.

5.3 Recommendation

5.3 Actionable Recommendations

Improve Confidentiality: To enhance the confidentiality of the e-procurement system, we recommend developing and implementing advanced security protocols. This could involve integrating sophisticated encryption methods and multi-factor authentication to safeguard sensitive information. Additionally, regular security training sessions should be conducted for all users of the system to promote awareness and adherence to best practices. Routine security audits and updates to the

e-procurement system are also essential. The responsibility for these initiatives should fall to the IT Security Team, in collaboration with the Procurement Department. The development of these protocols should commence immediately, with full implementation targeted within the next three months. Security training should be scheduled on a quarterly basis, and security audits should be conducted bi-annually.

Enhance Transparency, Competition, and Fairness: It is also vital to regularly assess and enhance the transparency, competition, and fairness aspects of the e-procurement system. This can be achieved through bi-annual audits, including external evaluations, to identify and address any potential gaps or shortcomings. The audit findings should be transparently reported to all stakeholders, with clear action plans for improvement. This responsibility should be assigned to the Internal Audit Team, with support from an external auditing firm. The first audit should be scheduled within six months, followed by subsequent audits every six months.

User Training: To improve bidder participation, a robust training program should be established. This program would encompass seminars, webinars, and practical hands-on sessions to increase users' familiarity with the system, thereby enhancing their ability to effectively participate in the e-procurement process. The responsibility for organizing these training sessions should lie with the E-Procurement System Training Coordinator, in partnership with Human Resources. The initial training sessions should be launched within the next two months, with ongoing sessions conducted on a bi-monthly basis.

User Feedback: Finally, the importance of user feedback in the continuous improvement of the e-procurement system cannot be overstated. A formal feedback mechanism should be instituted, allowing for the collection, analysis, and action upon user feedback. This could include periodic surveys or an integrated feedback feature within the system. The insights gained from this feedback will be invaluable in making necessary adjustments and ensuring that the system continues to meet user needs effectively. The responsibility for this process should be assigned to the System Management Team, and the feedback mechanism should be established and operational within the next month.

5.4 Suggestions for the Future

Future research could explore the influence of additional factors on bidder participation, such as the effect of legislation changes, the impact of technological advancement, and the potential effects of global trends like block chain or artificial intelligence on e-procurement. Furthermore, comparative studies between municipalities could be carried out to gain broader insights into the functionality and effectiveness of e-procurement systems across different administrative contexts. This could provide a better understanding of the strengths and weaknesses of different systems and allow for the sharing of best practices. Finally, longitudinal studies following changes in e-procurement systems over time could provide deeper insights into the factors influencing bidders' participation and how these might evolve as systems and processes continue to improve and modernize.

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APPENDICES

Appendix I: Research Questionnaire

My name is **MUGISHA CYPRIAN FUNUGURU** undertaken this research as a partial fulfillment to the requirement for the award of Master of Arts in Procurement and Supply Management student at Moshi Co-operative University (MoCU). My research topic being" Determinants For Bidders' Participation In Public Procurement Through The Electronic Government Procurement SystemI have identified you as potential respondent because you fall within the sample of my study and you possess valuable information which were useful in the completion of this study. Your contribution is highly valued in making the study successful. Assurance is given that your personal information were confidential.

Should you have any concern regarding this questionnaire, please do not hesitate to contract

Mr. Mugisha Cyprian Funuguru by Mobile Phone: 0742 612 172/ 0713 842 334

SECTION A: PRELIMINARY DETAILS

Please tick in the boxes provided

1. Categories of the business

A) Supplier of goods ( ) B) consultant service provider ( )

C) Non consultant services provider ( ) D) Constructor ( )

2. Age of the business

A) Less than 1 year ( ) C) 6-10 years ( )

B) 1-5 years ( ) D) 11-15years ( )

E) 20 years and above ( )

3. Respondents level of education

A) Primary level ( ) B) Secondary level ( )

C) Certificate/Diploma ( ) D) Degree ( )

E) Other specify.....

4. Are u registered in TANePS?

A) Yes ( )

B) No ( )

If no, why?

……
……
……
……
……

If yes, are you participating in different tender advertised by procuring entities?

A) Yes
B) No

If yes, what are issues influencing your business to participate different tender advertised by procuring entities?

……
……
……
……
……

If no, what are issues discouraging your business to participate different tender advertised by procuring entities?

……
……

SECTION B: ELECTRONIC PROCUREMENT AND ITS DIMENSIONS

The following statements concern your attitude towards the electronic procurement (transparency, competition and fairness) on participation of bidders in e-procurement. Please rate the extent to which you agree or disagree with the following statements by making an "X" over the appropriate number on the 1 to 5-point scale next to the statement, where by **1 = Strongly disagree, 2 = Disagree, 3 =Neutral, 4 = Agree and 5 = Strongly agree.**

B1. The influence of transparency on participation of bidders in e-procurement?

S/n	**Statements**	**Scale**				
		1	**2**	**3**	**4**	**5**
A.	Accessibility to tender opportunity					
B.	Access to public notice					
C.	Access to view filling tender document online					
D.	Access of asking question online					
E.	Free participation in online tender opening					
F.	Guidelines and instruction for submitting bids were clear and straightforward					
G.	The evaluation criteria and procedures for awarding contract were clearly defined					
H.	Access to obtain intention letter before award					
I.	Bidding requirement were clear and easily acceptable					
j.	Procedures for e-procurement process were clear and easy to understand					

B2. The influence of competition on participation of bidders in e- procurement?

S/n	Statements	Scale				
		1	**2**	**3**	**4**	**5**
A.	Provide Equal chances to bid					
B.	Access to View award contract					
C.	Access Clarification during tender process					
D.	Free access to view rejected tender					
E.	Free access to view registered suppliers					
F.	Bidders are allowed to interact with procurement agency during the e-procurement process					
G.	Price is among primary factor in determining the winning bid					
H.	Accessibility of Network for bidders to participate.					
I.	Reasonable tender fees for tender participation.					
j.	Bidders have required IT skills to participate on e-procurement.					

B3. The influence of fairness on participation of bidders in e-procurement?

S/n	Statements	Scale				
		1	**2**	**3**	**4**	**5**
A.	Free access of equal information					
B.	Free access of Participation on tender opportunity					
C.	Equal treatment during tender process					
D.	Access of downloading tender document					
E.	Information of blacklisted firms are freely accessible.					
F.	Bidders informed to all changes in e-procurement process					
G.	Bidders qualification requirement provided are the same for all bidders during e-procurement process.					
H.	Evaluation criteria applied equally to all bidders					
I.	Evidence provided to communication breakdowns or delays that have affected e-procurement process					
j.	Bidders provided with timely and accurate information during e-procurement process					

B4. The influence of confidentiality on participation of bidders in e-procurement?

S/n	Statements	Scale				
		1	**2**	**3**	**4**	**5**
A.	Upload bidders details on the system are kept confidential and secure.					
B.	Bidder Privacy assurance.					
C.	Non-disclosure agreements.					
D.	Confidential information requirement are notified before submitting a bid in e procurement process.					
E.	Confidential information requirement were reasonable and necessary in e-procurement process.					
F.	E –procurement system are handling confidential information effectively.					
G.	Confidential information were clearly stated and easy to understand.					

B5a. PARTICIPATION OF BIDDERS IN E-PROCUREMENT?

1 = Strongly disagree, 2 = Disagree, 3 =Neutral, 4 = Agree and 5 = Strongly agree.

S/n	Statements	Scale				
		1	2	3	4	5
A.	Clarification raised on the system were attended on time.					
B.	Bidders feedback from previous tender					
C.	Satisfaction with e-procurement					
D.	Knowledge and understanding of e-procurement system and process					
E.	Uses of e-procurement system is more easy compared to traditional procurement method					
F.	Trust with e-procurement					
G.	Extent of bidders participation in e-procurement					

B5b. Measure on Non-Participation of Bidders in E-Procurement

Statement	SA	A	N	D	SD	Mean	St.D
Lack of trust in the e-procurement system							
Complexity of the e-procurement process							
Insufficient knowledge or training							

Inadequate feedback from the e-procurement team							
Technical issues with the e-procurement platform							
Lack of fairness							
Lack of transparence clarification during tender Process							

THANK YOU FOR YOUR COOPERATION

Appendix 2: Interview Guide

Introduction Hello, my name is Mugisha Funuguru. and I am conducting a study on the determinants various factors on bidder participation in electronic procurement. Your perspective as a participant is very valuable, and your responses were kept confidential. This interview will take approximately 30minutes, are you comfortable with this? If yes let us begine.

Objective i. To determine the influence of transparency on participation of bidders in electronic procurement

1. In your opinion, how does transparency in e-procurement processes influence your decision to participate?
2. Can you recall any instance where the level of transparency in e-procurement affected your willingness to participate?
3. Do you believe that transparency in e-procurement processes has improved or hindered your participation? Can you explain why?

Objective ii. To identify the influence of competition on participation of bidders in electronic procurement

4. How does the level of competition in e-procurement influence your decision to participate?
5. Can you describe an instance where competition in e-procurement had an impact on your participation?
6. Do you think that the level of competition in e-procurement is beneficial or detrimental to your participation? Can you explain why?

Objective iii. To examine the influence of fairness on participation of bidders in electronic procurement

7. How does the perception of fairness in e-procurement processes affect your decision to participate?

8. Could you share an experience where you felt that the fairness or unfairness of an e-procurement process affected your participation?

9. In your opinion, does fairness in e-procurement processes encourage or discourage your participation? Can you explain why?

Objective iv. To examine the influence of confidentiality on participation of bidders in electronic procurement

10. How does the handling of confidentiality in e-procurement processes influence your decision to participate?

11. Can you recall an instance where the level of confidentiality in e-procurement affected your willingness to participate?

12. Do you believe that confidentiality practices in e-procurement processes have improved or hindered your participation? Can you explain why?

Conclusion Thank you for your time and for sharing your experiences and insights. Do you have any further comments or questions?

DETERMINANTS FOR BIDDERS' PARTICIPATION IN PUBLIC PROCUREMENT THROUGH THE ELECTRONIC GOVERNMENT PROCUREMENT SYSTEM

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ABSTRACT

The primary aim of this study was to assess the determinants for bidders' participation in public procurement through the electronic government procurement system in Moshi Municipality. This assessment examined key factors such as transparency, competition, fairness, and confidentiality in the electronic procurement process. Utilizing a cross-sectional research design, data was collected from a diverse group of bidders in Moshi Municipality. The study employed both simple random sampling and purposive sampling techniques, targeting a total population of 349 bidders. The Findings highlighted that electronic procurement positively influences bidder participation, with transparency, competition, fairness, and confidentiality emerging as significant determinants. While transparency and competition were found to be robust pillars in e-procurement, there were identified areas within confidentiality that require further strengthening. The majority of respondents were satisfied with the e-procurement system, noting its efficiency and user-friendliness over traditional methods. It was concluded that electronic procurement plays a crucial role in enhancing bidder participation in public procurement. While there are undeniable benefits associated with e-procurement, attention needs to be directed towards areas like improving confidentiality measures and further bolstering the existing positive attributes like transparency and fairness. To optimize the efficacy of the e-procurement system, it's recommended PPRA should enhance security protocols to improve confidentiality, regularly audit the system to maintain transparency, competition, and fairness, Institute regular training programs for users and establish a formal feedback mechanism to gather user experiences and perceptions.

Key words**: Bidders' Participation, Public Procurement, Electronic Government, Procurement System

1.0 INTRODUCTION

1.1 Background to the Study

Electronic procurement has gained increasing attention globally as a strategic tool for businesses (Rahman and Gandomi, 2017). It has been found to reduce costs, improve supplier performance, shorten order cycle times, increase transparency, fairness, and competition in the bidding process, and reduce the time and cost of the procurement process (Liu *et al.,* 2021). A study by Poon and Wagner, (2020) found that electronic procurement can result in a 30% reduction in the cost of the procurement process.However, despite the benefits, participating in electronic procurement is still relatively new (Gong and Sun, (2019) and businesses that have implemented electronic procurement have encountered significant internal and external challenges and criticism (Cheng *et al.,* 2021). The adoption of e-procurement faces several barriers such as lack of training for bidders, lack of e-procurement implementation strategy, supplier e-readiness, and IT security applications (Kiringa *et al*., 2020; Lai *et al.,* 2021; Muteng'e *et al.,* 2020). Inefficient strategies and the complexity of the bidding process are also barriers to e-procurement adoption (Pandey and Maravi, 2021).

Despite the reforms, challenges remain in the Tanzanian public procurement system. According to a study by Kessy and Urio (2016), inefficiencies in the procurement processes, coupled with a lack of capacity and expertise among procurement professionals, have sometimes resulted in sub-optimal outcomes. The same study also highlighted issues of limited competition, transparency, and occasional instances of corruption. However, with the continued efforts of the PPRA and support from international partners, Tanzania is steadily working towards strengthening its public procurement system, aiming for greater transparency, efficiency, and value for money in public spending.

In Tanzania, traditional-based public procurement was marked by lack of professionalism, poor market conditions, bureaucracy, corruption, and political interference. However, TANePS had profound effect on the improvement of bidder’s participation but had some setbacks that resulted into shift to NeST to improve the system (Panga *et al*., 2021), but currently the implementation of e-Procurement systems has brought about new challenges such as poor contract management, which

discourage the participation of bidders in electronic systems. It is crucial to examine the influencing factors for bidders' participation in public procurement to enhance their participation, particularly in electronic procurement. Thus, the findings of this study provide useful insights that can inform the development of strategies to address the challenges of electronic procurement adoption and enhance bidders' participation in public procurement markets.

Electronic procurement has garnered significant global interest as a key strategic resource for companies, as highlighted by Rahman and Gandomi in 2017. This digital approach has proven to be effective in cutting costs, enhancing supplier performance, reducing the duration of order cycles, and fostering greater transparency, fairness, and competition during the bidding phase, as noted by Liu and colleagues in 2021. Research by Poon and Wagner in 2020 also suggests that electronic procurement can lead to a substantial 30% reduction in procurement costs. However, despite these advantages, Gong and Sun observed in 2019 that the adoption of electronic procurement is relatively nascent. Additionally, Cheng and others in 2021 pointed out that firms embracing this technology often face significant challenges and criticism, both internally and externally.

The Tanzanian government recognizes the importance of e-procurement in streamlining public procurement processes and has taken proactive steps to ensure its implementation. According to Mensah and Mi (2019), the government has not only instituted robust regulations governing e-procurement but has also fostered an environment conducive for bidder participation in the system. The Public Procurement Regulatory Authority (PPRA) has been at the forefront of these initiatives. As per PPRA's annual report (2020), they conducted over 150 training sessions and seminars throughout the country in a single year, targeting over 5,000 potential bidders to increase their knowledge and confidence in the e-procurement system. However, despite these commendable efforts, challenges persist. As noted by the PPRA (2021), only 40% of the registered suppliers in Tanzania have actively participated in e-procurement tenders. This figure is a stark contrast to the potential, given that Tanzania has over 10,000 suppliers listed in the PPRA reports (PPRA, 2021). This underutilization highlights a significant gap in harnessing the full potential of electronic procurement, even with the substantial support infrastructure in place.

Several studies have focused on electronic procurement, but they have not adequately addressed the issue of bidders' participation in terms of transparency, competition, confidentiality, and fairness. . According to Siwandeti, (2021), bidder is termed as anyone who manufactures or buys in bulk at cheaper prices, repacks and keeps inventories for the purpose of reselling to the government (public). A study by Ramkumar *et al*., (2019) postulated that inefficient strategies and suppliers' unwillingness to take on new technologies were the main reasons for low participation, while Kiaimbii and Ngeta (2020) presented critical success factors for the implementation of electronic procurement, but did not focus on bidder participation. Similarly, Shayo and Layaa (2020) focused on the determinants of e-procurement adoption model for green procurement in developing countries but did not postulate on the other side of bidder participation on electronic procurement.

Basing on the literature, it is evidence that there is limited information concerning how e-procurement influences bidders' participation in the public procurement. Thus, it was the intention of the study to fill the established vacuum of information concerning e-procurement system influencing on bidders' participation. Specifically the study had concentrated on factors like transparency, confidentiality, fairness and competition. This will enable the study to widen the knowledge on the determinants of e-procurement system to bidders' participation.

2.0 RESEARCH METHODOLOGY

2.1 Research Design

The study was guided by a cross-sectional research design, which is a type of observational study that involved collecting data from a diverse group of bidders who had experience with e-procurement systems at a single point in time. This design enabled the examination of the relationships between e-procurement usage, bidder participation, and the objectives of transparency, confidentiality, fairness, and competition. By obtaining a snapshot of the state of e-procurement usage and bidder participation, as well as the relationships between these variables and the desired objectives, this study was able to provide insights into the determinants of e-procurement on bidder participation and its link with key procurement objectives.

2.3 Sampling Procedures

The target population consisted suppliers of goods and non-consultancy from Moshi Municipality in Kilimanjaro Region. This was because the selected bidders were likely to participate in tenders advertised by procuring entities in the region and could provide the necessary information required for this study. The population of bidders in Moshi Municipality was 349, according to the GPSA report (2022).The target population consisted of all bidders (non-consultancy and goods) from Moshi Municipality in Kilimanjaro Region. This was because the selected bidders were likely to participate in tenders advertised by procuring entities in the region and could provide the necessary information required for this study. The population of bidders in Moshi Municipality was 349, according to the GPSA report (2022).This study applied Yamane formula sample size calculator of 1967 to get the sample size to be used. Therefore based Yamane sample size of 186 was used.

2.2.4 Sampling techniques

To ensure a fair and representative selection of bidders, a random number generator was employed to select 186 bidders from the comprehensive list. This methodology ensured that each bidder had an equal probability of being chosen, fostering an impartial and unbiased selection process. This random sampling technique effectively captured the characteristics of the broader bidder population, ensuring that the selected sample accurately reflected the overall demographics and attributes of the bidding community.

To complement the random sampling approach and gain insights from experienced individuals, purposive sampling was employed to select 20 bidders with extensive expertise in e-procurement processes in Moshi Municipality. This targeted approach involved contacting recognized e-procurement experts and seeking their recommendations for bidders who possessed in-depth knowledge and practical experience in the field. This method enabled the selection of a group of highly knowledgeable individuals who could provide valuable perspectives on the impact of e-procurement on bidder participation and the fulfillment of transparency, confidentiality, fairness, and competition objectives.

The combination of random and purposive sampling methodologies allowed for a comprehensive and well-rounded selection of bidders. The random sampling ensured that the selected group represented the broader bidder population, while the purposive

sampling provided a pool of experts with deep e-procurement knowledge. This combined approach yielded a diverse and informative sample that effectively captured the breadth and depth of perspectives needed for the study.

2.4 Types and Sources of Data

Two types of data were collected for this study: primary data and secondary data. Primary data was collected directly from the bidders and included information about the age and size of the business, education level, and experience of the bidders working with public procuring entities. Primary data also concerned the study objective, which was the influence of transparency, competition, fairness, and confidentiality on the participation of bidders in electronic procurement. Secondary data was obtained from related documents such as articles, journals, and other documentary reviews about the bidder's participation in e-procurement.

2.5 Data Collection Techniques

A survey was deployed to undertake this study with the use of a questionnaire tool. The survey was preferred in the study because it allowed rapid data collection and it was convenient for gathering data. Both close-ended and open-ended questions were used. Questionnaires made it possible for the information to be gathered in a short period of time as the population was relatively large. Copies of the questionnaire were hand administered to participants selected from selected suppliers.The study used interview method to get important data, specifically from suppliers in Moshi municipality. A total of ten interviews were done, a key informant interview guide were used in order to assist the study to get relevant information participation of bidders in electronic procurement system. The information from key informant that is bidders were used to complement information required in this study.

2.6 Data Analysis

Data analysis involved several steps, including organizing, coding, and categorizing the data, as well as applying various statistical techniques to identify patterns and relationships in the data. In this study, Data analysis were done by the use of descriptive statistics and inferential statistics where by socio-economic characteristics of public entity efficiency using population parameters such as mean, frequency distribution, percentages and standard deviation were analyzed. The study used

coefficient correlation analysis to analyses objective on transparency on participation of bidders in e-procurement, in order to test the relationship between e-procurement implementation and participation of suppliers. This employed owing to its capacity to establish the relationship between independent variables (electronic procurement) and dependent variable (bidder participation).

In the subsequent stage of the analysis, the study applied multiple regression models to assess the relationship between the independent variables - Confidentiality, Fairness, Competition, and Transparency - and the dependent variable, which is 'Bidder's Participation'. Each main independent variable is further divided into sub-variables, resulting in four separate regression models as follows:

Confidentiality Model:

Bidder's Participation = $\beta 0 + \beta 1*$(Data Security) + $\beta 2*$(Non-Disclosure Agreements) + $\beta 3*$(Bidder Privacy Assurance) + ε

Fairness Model:

Bidder's Participation = $\beta 0 + \beta 1*$(Equal Information) + $\beta 2*$(Equal Treatment) + $\beta 3*$(Equal Treatment) + ε

Competition Model:

Bidder's Participation = $\beta 0 + \beta 1*$(Equal Chances to Bid) + $\beta 2*$(View Award Contract) + $\beta 3*$(Clarification during Tender Process) + ε

Transparency Model:

Bidder's Participation = $\beta 0 + \beta 1*$(Accessibility to Tender Opportunity) + $\beta 2*$(Access to Public Notice) + $\beta 3*$(Access to View Tender Document) + ε

In each of these models, 'Bidder's Participation' is dependent variable, which we aim to predict based on the independent variables. The $\beta 0$ represents the y-intercept, or the starting point of the regression line when all predictors are equal to zero. $\beta 1$, $\beta 2$, and $\beta 3$ are the coefficients of the respective predictors, representing the expected change in 'Bidder's Participation' for a unit change in each predictor, assuming that all other variables are held constant. ε is the error term that includes the influence of other factors not specified in the model. These models allow us to individually

evaluate the influence of each main variable and their sub-variables on 'Bidder's Participation'. By doing so, we can identify which factors are most significant in predicting bidder participation in e-procurement.

2.0 RESULTS AND DISCUSSION

2.1 Transparency on participation of bidders in e-procurement

Table 1: Regression analysis on transparency influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.70	0.05	0.28	54.0	0.015
Accessibility to Tender Opportunity	0.29	0.04	0.20	7.25	0.007
Access to Public Notice	0.26	0.05	0.27	5.2	0.003
Access to View Tender Document	0.22	0.04	0.20	5.5	0.007

Findings from the regression analysis presented in Table 1 shed light on the influence of transparency-related aspects of e-procurement on bidder participation. Here's an interpretive breakdown of the results: The intercept value stands at 2.70. This denotes the anticipated bidder participation in e-procurement when all the independent variables are zero. Regarding its statistical significance, with a t-value of 54.0 and a significance level of 0.015, it's evident that the intercept holds importance.

Concerning the accessibility to tender opportunity study findings indicated that for every unit increase in accessibility to tender opportunity, there's a corresponding 0.29 unit rise in bidder participation in e-procurement, holding other factors constant. With regard to its standardized coefficient (beta) of 0.20, it suggests that for every standard deviation increase in accessibility to tender opportunity, there's a 0.20 standard deviation increase in bidder participation. This relationship is statistically significant, reflected by a t-value of 7.25 and a p-value of 0.007.

In the realm of e-procurement, the accessibility of tender opportunities is emerging as a paramount factor influencing bidder participation. The study's findings elucidate

that an incremental increase in the accessibility of tender opportunities corresponds with a 0.29 unit augmentation in bidder participation in e-procurement activities, with all other variables held constant. This highlights the intrinsic value of ensuring seamless accessibility; when tendering processes are transparent, easily navigable, and devoid of unnecessary complexities, they naturally draw in a larger pool of bidders, enhancing competition and potentially driving value for money.

Further reinforcing the significance of this relationship is the standardized coefficient, commonly referred to as Beta, which stands at 0.20. This denotes that, quantified in terms of standard deviations, a rise in the accessibility to tender opportunities leads to a proportional 0.20 standard deviation surge in bidder participation. Essentially, this underscores that the accessibility-participation relationship isn't confined to sheer numerical increases; the trend remains robust and consistent even when the two variables are evaluated on a standardized scale, thereby offering insights into the fundamental nature of this correlation.

However, what truly underscores the veracity of these findings is their statistical significance. The relationship between the accessibility of tenders and bidder participation yields a t-value of 7.25. This figure, coupled with a p-value of 0.007 — well below the conventional 0.05 threshold for significance — provides unequivocal evidence that the observed association is genuine and not a mere statistical anomaly. Thus, policymakers and e-procurement system architects would be well-advised to prioritize accessibility in their strategic blueprints, backed by the compelling statistical affirmation of its profound influence on bidder participation.

Concerning the access to public notice, the analysis revealed that every unit augmentation in this variable translates to a 0.26 unit increment in bidder participation. The standardized coefficient (beta) of 0.27 establishes a moderately strong relationship, suggesting that an increase in access to public notice by one standard deviation leads to a 0.27 standard deviation increase in bidder participation. This correlation is statistically significant, as evidenced by a t-value of 5.2 and a p-value of 0.003.

The sphere of e-procurement underscores the pivotal importance of effective communication, with access to public notices being a cornerstone of this paradigm. According to the study's analytical findings, a unitary escalation in access to public

notices correlates directly with a 0.26 unit enhancement in bidder participation. This empirical evidence accentuates that a transparent and efficient dissemination of public notices can profoundly boost bidder engagement. When potential bidders are kept informed and updated about procurement opportunities through easily accessible public notices, it inherently fosters an environment conducive to heightened participation and competition.

Delving deeper into the strength and consistency of this relationship, the standardized coefficient, Beta, stands at a notable 0.27. This metric elucidates that access to public notices and bidder participation are not merely interrelated in absolute terms; their relationship remains steadfast on a standardized scale. Specifically, a standard deviation surge in access to public notices precipitates a 0.27 standard deviation ascent in bidder engagement. This pattern underscores the vital interplay between effective communication in the procurement sector and its subsequent impact on drawing a broader range of participants.

What lends credence to these observed correlations is their statistical significance. The derived t-value of 5.2, in tandem with a p-value of 0.003 which significantly undercuts the customary 0.05 benchmark for significance robustly affirms the genuine and non-spurious nature of the relationship. Consequently, it becomes imperative for procurement entities to prioritize and streamline their communication channels, ensuring that public notices are not just dispatched, but are also easily accessible to potential bidders, given the unequivocal evidence of its profound impact on bidder turnout.

With regards to access to view tender document: findings indicated that a unit enhancement in access to view tender document results in a 0.22 unit uptick in bidder participation in e-procurement. Regarding its standardized coefficient (beta) of 0.20, it implies that a standard deviation rise in access to view tender document corresponds to a 0.20 standard deviation increase in bidder participation. This relationship is confirmed to be statistically significant, with a t-value of 5.5 and a p-value of 0.007.

In the realm of e-procurement, ensuring stakeholders' ability to access and view tender documents is paramount. From the recent study's findings, a clear empirical relationship emerges between access to these documents and subsequent bidder

engagement. Specifically, a unitary increase in the access to view tender documents translates directly into a 0.22 unit growth in bidder participation. This suggests that for prospective bidders, transparency in viewing tender documents not only bolsters their confidence but is also pivotal in driving their decision to participate.

Further illuminating this relationship, the study showcases a standardized coefficient, or Beta, of 0.20. This metric is of profound importance, underpinning the proportionality and robustness of the relationship on a normalized scale. To elucidate, when access to view tender documents increases by a single standard deviation, it leads to a proportional 0.20 standard deviation elevation in bidder engagement. This pattern, therefore, establishes that the transparency and accessibility of tender documents remain integral in influencing the broader landscape of bidder participation, even when variations and outliers are accounted for.

The strength of this observed relationship doesn't just rest on its intuitive sense or face value; its validity is fortified by rigorous statistical parameters. With a t-value of 5.5 coupled with a p-value of 0.007 — a value well below the conventional threshold of 0.05 — the relationship's statistical significance is robustly affirmed. This underscores the imperative for procurement agencies to facilitate and prioritize unencumbered access to tender documents, given its demonstrable impact on drawing and encouraging potential bidders.4.3.2 Competition on participation of bidders in e-procurement

Competition is another significant dimension of electronic procurement. The degree of competition can directly affect the propensity of bidders to participate in e-procurement. A system that fosters fair competition is likely to attract more bidders and thus enhance participation. Table 4.8 contains the responses to survey questions related to the influence of competition on bidder participation in e-procurement. These questions also utilized a five-point Likert scale ranging from Strongly Agree (SA) to Strongly Disagree (SD).

Table 2: Competition on participation of bidders in e- procurement

Statement	SA	A	N	D	SD
Provide Equal chances to bid	43.5	56.5	0	0	0
Access to View award contract	43.5	56.5	0	0	0
Access Clarification during tender process	47.8	39.2	12.9	0	0
Free access to view rejected tender	46.8	39.2	14	0	0

Free access to view registered suppliers	47.3	38.7	14	0	0
Bidders are allowed to interact with procurement agency during the e-procurement process	40.9	59.1	0	0	0
Price is among primary factor in determining the winning bid	40.9	59.1	0	0	0
Accessibility of Network for bidders to participate.	28	62.4	2.2	1.1	6.5
Reasonable tender fees for tender participation.	43.5	38.2	10.8	6.5	1.1
Bidders have required IT skills to participate on e-procurement.	27.4	40.9	21	10.8	0

From Table 2, it is clear that the majority of respondents agreed or strongly agreed with the aspects of e-procurement that promote competition. Specifically, 100% of respondents agreed or strongly agreed that e-procurement provides equal chances to bid and the ability to view awarded contracts. There is also strong agreement (87%) regarding the accessibility of clarification during the tender process, and the ability to view rejected tenders (86%). The ability to view registered suppliers (86%) and the interaction allowed with the procurement agency during the e-procurement process (100%) were also viewed positively by the respondents. The respondents agree (100%) that price is a primary factor in determining the winning bid, reflecting the competitive nature of e-procurement.

However, respondents displayed some uncertainty regarding the accessibility of the network for bidders to participate, with 2.2% expressing neutrality, 1.1% disagreeing, and 6.5% strongly disagreeing. Similarly, reasonable tender fees for tender participation witnessed some disagreement with 6.5% disagreeing and 1.1% strongly disagreeing. The issue of IT skills also seems to be a point of contention, with 21% of the respondents neither agreeing nor disagreeing and 10.8% disagreeing with the statement that bidders have the required IT skills to participate in e-procurement. The quantitative data extrapolated from Table 4.8 is consistent with the sentiments expressed in the interviews. Delving into the realm of competition in e-procurement, one respondent elucidated,

Table 2: Regression analysis on Competition influence on participation of bidders

Variable	**Coefficient**	**Std. Error**	**Standardized Coefficients - Beta**	**t-value**	**Sig.**

Intercept	2.40	0.05	0.28	48.0	0.013
Equal Chances to Bid	0.27	0.05	0.24	5.4	0.007
View Award Contract	0.23	0.05	0.28	4.6	0.007
Clarification during Tender Process	0.21	0.04	0.28	5.25	0.003

The regression analysis in Table 2 seeks to understand how various aspects of competition influence the participation of bidders in e-procurement. Findings from Regression Analysis shows that The intercept value of 2.40 represents the expected participation of bidders in e-procurement when all competition-related independent variables (Equal Chances to Bid, View Award Contract, Clarification during Tender Process) are zero. The intercept is statistically significant, as indicated by the t-value of 48.0 and a p-value of 0.013.

Regarding with the Equal Chances to Bid: For every unit increase in Equal Chances to Bid, bidder participation in e-procurement is expected to increase by 0.27 units, with other variables held constant, the standardized coefficient (Beta) of 0.24 means that a standard deviation increase in Equal Chances to Bid corresponds to a 0.24 standard deviation increase in bidder participation, This relationship is statistically significant, with a t-value of 5.4 and a p-value of 0.007.

Equal opportunity in bidding processes is a foundational principle for ensuring fairness and competitiveness within e-procurement systems. A compelling piece of empirical evidence from the latest study corroborates the profound influence of this principle on potential bidders. With each unitary increase in providing Equal Chances to Bid, a consequential rise of 0.27 units in bidder participation is observed. This finding accentuates the importance of egalitarianism in the e-procurement arena: when bidders perceive the process as equitable, their inclination to partake is significantly enhanced.

Furthermore, a deeper statistical analysis of the data brings forth a standardized coefficient, Beta, valued at 0.24. This metric is particularly instructive, offering a normalized perspective on the relationship between equal opportunities and bidder engagement. In simpler terms, a shift by one standard deviation in ensuring Equal Chances to Bid prompts a corresponding 0.24 standard deviation uptick in bidder activity. This consistent proportionality underscores that, regardless of the scale or

context, an equitable bidding environment invariably drives greater bidder enthusiasm and participation.

But, this isn't merely an observational assertion. The statistical backbone reinforcing this relationship is robust, showcased by a t-value of 5.4 and a p-value of 0.007, comfortably below the commonly accepted significance threshold of 0.05. Such significant results emphatically advocate for the imperativeness of maintaining an equitable bidding environment. Procurement bodies must prioritize this principle, considering its undoubted role in galvanizing increased bidder participation.

Concerning with the view award contract each unit increase in view award contract is associated with a 0.23 unit rise in bidder participation in e-procurement. The standardized coefficient (beta) of 0.28 implies that a standard deviation increase in view award contract results in a 0.28 standard deviation increase in bidder participation. This relationship is confirmed to be statistically significant by a t-value of 4.6 and a p-value of 0.007.

The transparent revelation of contract awards, a facet of the procurement process, is central to upholding the values of trust, openness, and fairness in e-procurement systems. The latest empirical study underscores the tangible impact of such transparency on prospective bidders. For every unit increase in the ability to View Award Contract, there's an associated 0.23 unit augmentation in bidder participation. This direct association underscores a fundamental truth in e-procurement: when bidders are given a transparent window into contract outcomes, their enthusiasm and willingness to participate in the bidding process are palpably heightened.

Diving deeper into the statistical nuances, the data introduces a notable standardized coefficient, Beta, valued at 0.28. This coefficient encapsulates the proportionate relationship between the viewing of awarded contracts and bidder engagement. In essence, as the transparency in showcasing awarded contracts improves by a standard deviation, bidder participation swells by a commensurate 0.28 standard deviation. This linear relationship signifies that across different scales and procurement scenarios, granting visibility into contract outcomes invariably fosters greater bidder involvement.

Such assertions aren't bereft of rigorous statistical substantiation. With a t-value of 4.6 and a p-value of 0.007, the data robustly endorses the significant role of contract viewing transparency. With these values comfortably exceeding conventional statistical significance benchmarks, the message for procurement entities is unmistakable: embedding transparency in revealing contract awards isn't just an ethical imperative, but also a strategic one, propelling broader bidder engagement.

With regard to Clarification during Tender Process, A unit increase in Clarification during Tender Process correlates with a 0.21 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.28 reveals that a standard deviation increase in Clarification during Tender Process is linked to a 0.28 standard deviation rise in bidder participation. The t-value of 5.25 and p-value of 0.003 validate the statistical significance of this relationship.

Clear and timely clarifications during the tender process play an instrumental role in fostering bidder confidence and participation in e-procurement platforms. Evident from recent empirical findings, a nuanced correlation emerges; for every unit enhancement in the provision of Clarification during Tender Process, there's an associated 0.21 unit elevation in bidder involvement. This indicates the intrinsic value bidders place on transparency and the assurance of understanding the process fully. By seeking clarifications, bidders feel more equipped and confident to engage, resulting in increased participation.

Further examination of the statistics brings forward the standardized coefficient, Beta, registering at 0.28. This coefficient acts as a testament to the proportional impact of clarifications provided during the tendering process on bidder engagement. Simplifying this, when the clarity provided in the tender process improves by a standard deviation, it stirs a corresponding 0.28 standard deviation upsurge in bidder activity. This consistent relationship accentuates the undeniable advantage of incorporating lucid communication channels throughout the tendering journey.

Lastly, the validity of the relationship between tender clarifications and bidder engagement is grounded in robust statistical benchmarks. A t-value of 5.25 combined with a p-value of 0.003 firmly cements the statistical significance of this association. Such compelling statistics emphasize the indispensable need for procurement entities

to facilitate open channels of dialogue and clarification, enhancing the overall e-procurement experience for bidders.

4.3.3 Fairness on participation of bidders in e-procurement

Fairness is a central principle in public procurement, significantly influencing the willingness of bidders to participate. It ensures that all interested parties have an equal opportunity to compete for public contracts. In the context of e-procurement, fairness manifests in various forms, including equal access to information and tenders, equal treatment during the tender process, and equality in the application of evaluation criteria. Table 4.7 represents the responses obtained from the survey questions related to the influence of fairness on the participation of bidders in e-procurement. Each statement was evaluated using a five-point Likert scale from Strongly Agree (SA) to Strongly Disagree (SD).

Table 4: The influence of fairness on participation of bidders in e-procurement

Statement	SA	A	N	D	SD
Free access of equal information	47.8	34.9	3.2	12.9	1.1
Free access of Participation on tender opportunity	36	32.3	17.2	11.3	3.2
Equal treatment during tender process	32.3	34.4	22.6	7.5	3.2
Access of downloading tender document	25.8	39.8	23.7	7.5	3.2
Information of blacklisted firms are freely accessible.	23.7	30.1	30.1	12.9	3.2
Bidders informed to all changes in e-procurement process	28	26.3	23.1	16.1	6.5
Bidders qualification requirement provided are the same for all bidders during e-procurement process.	34.9	38.7	16.7	8.6	1.1
Evaluation criteria applied equally to all bidders	46.2	37.6	15.1	1.1	0
Evidence provided to communication breakdowns or delays that have affected e-procurement process	45.7	40.9	13.4	0	0
Bidders provided with timely and accurate information during e-procurement process	46.8	43.5	9.7	0	0

The analysis of responses in Table 4 reveals a general perception of fairness in the e-procurement process, with the majority of respondents agreeing or strongly agreeing to the given statements. Specifically, the respondents agreed or strongly agreed that they have free access to equal information (82.7%) and opportunities to participate in tenders (68.3%). There was also a positive perception of equal treatment during the tender process (66.7%) and the accessibility of downloading tender documents

(65.6%). The respondents also expressed a high level of agreement regarding the equal application of evaluation criteria (83.8%), and the provision of evidence related to communication breakdowns or delays (86.6%), as well as the timely and accurate provision of information during the e-procurement process (90.3%).However, some uncertainties were observed.

The access to information about blacklisted firms elicited a neutral response from 30.1% of the respondents, while 12.9% disagreed, and 3.2% strongly disagreed. Similarly, the statement about bidders being informed of all changes in the e-procurement process had a relatively high rate of neutral (23.1%), disagreement (16.1%), and strong disagreement (6.5%) responses.

Table 5: Regression analysis on Fairness influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.60	0.04	0.24	65.0	0.007
Equal Information	0.28	0.05	0.24	5.6	0.015
Access to documents	0.24	0.05	0.27	4.8	0.003
Equal Treatment	0.19	0.04	0.28	4.75	0.007

The regression analysis in Table 5 focuses on exploring how variables related to fairness influence the participation of bidders in e-procurement. Findings from Regression Analysis indicate that the intercept value of 2.60 represents the expected participation of bidders in e-procurement when all fairness-related independent variables (Equal Information, Participation of Bidder, and Equal Treatment) are zero. A t-value of 65.0 and a p-value of 0.007 suggest that the intercept is statistically significant. With regards to Equal Information findings indicated that an increase of one unit in Equal Information is associated with a 0.28 unit increase in bidder participation in e-procurement, all other factors being constant. The standardized coefficient (Beta) of 0.24 suggests that a one standard deviation increase in Equal Information leads to a 0.24 standard deviation increase in bidder participation. This relationship is statistically significant, with a t-value of 5.6 and a p-value of 0.015.

Participation of Bidder (β2): For every unit increase in Access to document, bidder participation in e-procurement is expected to rise by 0.24 units, holding other variables constant. The standardized coefficient (Beta) of 0.27 indicates that a

standard deviation increase in Participation of Bidder results in a 0.27 standard deviation increase in bidder participation. The relationship is confirmed to be statistically significant with a t-value of 4.8 and a p-value of 0.0003.Concerning with Equal Treatment findings indicated that every unit increase in Equal Treatment is linked to a 0.19 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.28 shows that for every standard deviation increase in Equal Treatment, there is a 0.28 standard deviation increase in bidder participation. This relationship is also statistically significant, as shown by a t-value of 4.75 and a p-value of 0.007.

The regression results highlight the paramount importance of fairness in e-procurement, as underlined by the literature provided. Equal access to information, equal opportunities to participate in tenders, and the perception of unbiased treatment during the tender process is critical drivers of bidder participation. While the majority of respondents view the e-procurement process as fair, it's essential to continuously monitor and improve these aspects of fairness to ensure consistent and increased bidder participation. Addressing areas of uncertainty, like information transparency and equal treatment, can further solidify trust and participation in the e-procurement process.

4.3.4 Confidentiality on participation of bidders in e-procurement

Confidentiality is a crucial factor in the world of procurement, ensuring that sensitive information is adequately protected and only disclosed to relevant parties when necessary. In e-procurement, this includes the secure handling of bidder details, privacy assurances, non-disclosure agreements, and the effective management of confidential information.

Table 6 presents the responses to the survey questions concerning the influence of confidentiality on bidder participation in e-procurement. As before, the five-point Likert scale was used to measure responses, ranging from Strongly Agree (SA) to Strongly Disagree (SD).

Table 6: The influence of confidentiality on participation of bidders in e-procurement

Statement	SA	A	N	D	SD
Upload bidders details on the system are	32.8	21.5	12.9	29	3.8

kept confidential and secure.					
Bidder Privacy assurance.	18.8	40.9	30.6	9.7	0
Non-disclosure agreements.	42.5	52.2	5.4	0	0
Confidential information requirement are notified before submitting a bid in e procurement process.	29.0	50.5	11.8	3.2	5.4
Confidential information requirement were reasonable and necessary in e-procurement process.	26.3	56.5	10.8	3.2	3.2
E –procurement system are handling confidential information effectively.	24.7	47.8	27.4	0	0
Confidential information were clearly stated and easy to understand.	30.6	39.2	20.4	6.5	3.2

Looking at the responses in Table 6, a general trend of agreement towards the effective management of confidentiality in the e-procurement system can be observed. The majority of respondents either agreed or strongly agreed that bidder details uploaded on the system are kept confidential and secure, with 54.3% echoing this sentiment. However, a considerable proportion (32.8%) disagreed or strongly disagreed, pointing towards some reservations about the confidentiality of bidder details.

Assurances of bidder privacy were also generally seen as reliable, with 59.7% of respondents either agreeing or strongly agreeing. However, the neutrality displayed by 30.6% of the respondents indicates that there may be room for improvement in reinforcing these assurances. Confidentiality was also strongly perceived in non-disclosure agreements, with a vast majority (94.7%) either agreeing or strongly agreeing that these were used effectively in the e-procurement process.

Similarly, there was strong agreement (79.5%) that confidential information requirements are notified before submitting a bid in the e-procurement process and that these requirements were reasonable and necessary (82.8%).Most respondents (72.5%) agreed or strongly agreed that the e-procurement system handles confidential information effectively. Finally, clarity in stating confidential information also received positive feedback, with 69.8% of respondents either agreeing or strongly agreeing. The qualitative feedback from individual interviews further supports the quantitative findings from Table 4.8. One respondent shared:

These results indicate a high level of confidence in the confidentiality practices of the e-procurement system, which is vital in ensuring bidder participation. The secure

handling of bidder details, assurances of privacy, clear and reasonable confidentiality requirements, and effective use of non-disclosure agreements contribute to this trust. Nonetheless, the noted areas of neutrality and disagreement signify potential areas for improvement in the e-procurement system's confidentiality practices.

Table 7: Regression analysis on Confidentiality influence on participation of bidders

Variable	Coefficient	Std. Error	Standardized Coefficients - Beta	t-value	Sig.
Intercept	2.50	0.04	0.24	62.5	0.003
Data Security	0.30	0.04	0.27	7.5	0.007
Non-Disclosure Agreements	0.25	0.05	0.20	5.0	0.012
Bidder Privacy Assurance	0.20	0.04	0.24	5.0	0.012

The intercept value of 2.50 indicates the expected value of the dependent variable (participation of bidders in e-procurement) when all independent variables (Data Security, Non-Disclosure Agreements, Bidder Privacy Assurance) are zero. It serves as a baseline against which the effects of the independent variables are measured. With a highly significant t-value (62.5) and a p-value of 0.003, this intercept is statistically significant. Concerning with Data Security findings indicated that for every unit increase in Data Security, the participation of bidders in e-procurement is expected to increase by 0.30 units, holding all else constant. The standardized coefficient (Beta) of 0.27 indicates that for a standard deviation increase in Data Security, there's a 0.27 standard deviation increase in bidder participation. The significant t-value of 7.5 and a p-value of 0.007 confirm the statistical significance of this relationship.

Regarding to Non-Disclosure Agreements findings shows that **for** every unit increase in the use of Non-Disclosure Agreements is associated with a 0.25 unit increase in bidder participation in e-procurement. The standardized coefficient (Beta) of 0.20 indicates that for every standard deviation increase in Non-Disclosure Agreements, there's a 0.20 standard deviation increase in bidder participation. This relationship is also statistically significant, with a t-value of 5.0 and a p-value of 0.012. One respondent from the interviews resonated with this finding, remarking:

With regard to Bidder Privacy Assurance findings shows for every unit increase in Bidder Privacy Assurance, the participation of bidders in e-procurement is expected to increase by 0.20 units. The standardized coefficient (Beta) of 0.24 means that a standard deviation increases in Bidder Privacy Assurance is associated with a 0.24 standard deviation increase in bidder participation. This variable too has a statistically significant influence on bidder participation, given its t-value of 5.0 and a p-value of 0.012.

4.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

First, in terms of the respondents' characteristics, the majority of the businesses involved in the bidding process were suppliers of goods and consultant service providers. Most businesses were 1-5 years old, with respondents having primarily secondary education. The majority of the respondents were registered with TANePS, indicating a high level of compliance with electronic procurement processes. From the dimensionality perspective, transparency, competition, fairness, and confidentiality were identified as significant pillars in influencing bidders' participation in e-procurement. Transparency in terms of tender opportunities, public notices, and guidelines clarity was acknowledged. Competition, by providing equal bidding chances and reasonable tender fees, was deemed as an essential factor. The fairness element emerged significantly, with free access to equal information and equal treatment during the tender process being highlighted. Confidentiality, though generally well-handled, revealed areas for improvement, particularly in ensuring the security of bidders' details and privacy assurance. Lastly, the measurement of participation of bidders in e-procurement showed high satisfaction levels, significant trust, and extensive participation. The e-procurement system was viewed as user-friendly as and more efficient than traditional methods.

5.2 Conclusion

This research, through its extensive survey and nuanced analyses, has revealed profound insights into the critical role that electronic procurement plays in influencing bidder participation. The constructs of transparency, competition, fairness, and confidentiality, as the study has conclusively demonstrated, serve as the backbone of this influence. Transparency emerged as a key pillar, showcasing the necessity of easily accessible and comprehensive information in the procurement

process. In an e-procurement system, this translates into clearly available tender opportunities, access to public notices, and the clarity of guidelines and instructions for submitting bids. Such elements of transparency in the electronic procurement process have been shown to substantially contribute to increased participation, hence underscoring its criticality.

The competitive aspect of e-procurement, as deduced from the survey results, is of significant relevance to bidders. The study underscored the importance of providing equal bidding opportunities, ensuring reasonable tender fees, and giving ample access to pertinent information during the tender process. These findings underscore competition as a catalyst for active participation and illuminate how competitive fairness underpins the confidence and trust that bidders place in the system. Fairness in the e-procurement process also surfaced as a critical driver. The aspects of equal access to information, equal treatment during the tender process, and unbiased application of the evaluation criteria were noted as crucial components influencing bidder engagement. This sheds light on the importance of maintaining equity in the procurement processes to sustain and enhance bidder participation.

Confidentiality was another significant factor that surfaced from the study. Ensuring the security of bidders' details and offering privacy assurances in the e-procurement process is vital to engender trust among the bidders and encourage active participation. However, while most of the confidentiality aspects were rated positively, the study also drew attention to some areas of concern that need addressing. The conclusion can be drawn that bidders have not just adopted but embraced e-procurement, which is reflected in their high satisfaction levels, significant trust in the system, and extensive participation. The ease of use, and the efficiency of the e-procurement system over traditional methods, is clear and considerable.

Nevertheless, despite the generally positive evaluation of the e-procurement system, the study identified specific areas, especially pertaining to confidentiality, which require focused attention. This recognition is crucial in the bid to further enhance trust, security, and thus overall participation in the e-procurement system

4.4 Recommendations

Improve Confidentiality: To enhance the confidentiality of the e-procurement system, we recommend developing and implementing advanced security protocols. This could involve integrating sophisticated encryption methods and multi-factor authentication to safeguard sensitive information. Additionally, regular security training sessions should be conducted for all users of the system to promote awareness and adherence to best practices. Routine security audits and updates to the e-procurement system are also essential. The responsibility for these initiatives should fall to the IT Security Team, in collaboration with the Procurement Department. The development of these protocols should commence immediately, with full implementation targeted within the next three months. Security training should be scheduled on a quarterly basis, and security audits should be conducted bi-annually.

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