

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

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KNUST SCHOOL OF BUSINESS

DEPARTMENT OF SUPPLY CHAIN INFORMATION SYSTEMS

**EVALUATING THE EFFECT OF E-PROCUREMENT ON PUBLIC SECTOR
OPERATIONS: A STUDY OF SELECTED OUTFITS IN ACCRA METROPOLIS**

BY

SARAH BOATENG

NOVEMBER, 2023

**EVALUATING THE EFFECT OF E-PROCUREMENT ON PUBLIC SECTOR
OPERATIONS: A STUDY OF SELECTED OUTFITS IN ACCRA METROPOLIS**

By

Sarah Boateng, BSc (Logistics)

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in partial fulfillment of the requirements for the degree of

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DECLARATION

I hereby declare that this submission is my work toward the Master's Degree in Procurement and Supply Chain Management that, to the best of my knowledge, it contains no material previously published by another person nor material that has been accepted for the award of any other degree of the University, except where due acknowledgments has been made in the text.

Sarah Boateng

PG9453821

Signature

Date

Student

Certified by:

Dr. Seth Nkrumah

.....

Supervisor

Signature

Date

Certified by:

Prof. David Asamoah

.....

The Head of Department

Signature

Date

ABSTRACT

The effect of e-procurement on public sector operations. The study evaluates the effect of eprocurement using selected outfits in Accra Metropolis. Specifically, it identified e-procurement practices in the public sector. It also assessed the public sector operations in selected outfit within Accra Metropolis. Descriptive research was adopted and quantitative methodology was used to retrieve primary data through questionnaires administration from managers and directors within the public sector organizations in the selected outfit in Accra Metropolis. SPSS software was used for data analysis. The study identified e-procurement practices as involving electronic tendering, electronic purchasing, electronic auctioning and invoicing which were generally agreed upon by the respondents. The study identified the effect of e-procurement practices by considering it based upon quality and cost efficiency, timeliness and improvement in communication and was generally agreed upon by the respondent. The study generally found e-procurement as helping organizations to improve upon efficiency, effectiveness in operations, value for money procurement, improvement in services and increased procurement capacity. The study recommended that there should be provision of funds to acquire e-procurement technology, such as computers and automated machines to undertake e-procurement. There should also be competent staff to undertake e-procurement. Senior managers of the organizations should also be committed to eprocurement as that will lead to the attainment of objectives.

DEDICATION

This work is dedicated to the Almighty God for his care and protection in completing this study and to the Okyere Darko family, the Boateng family, and Mr. Ali Napari Seidu for their support and encouragement.



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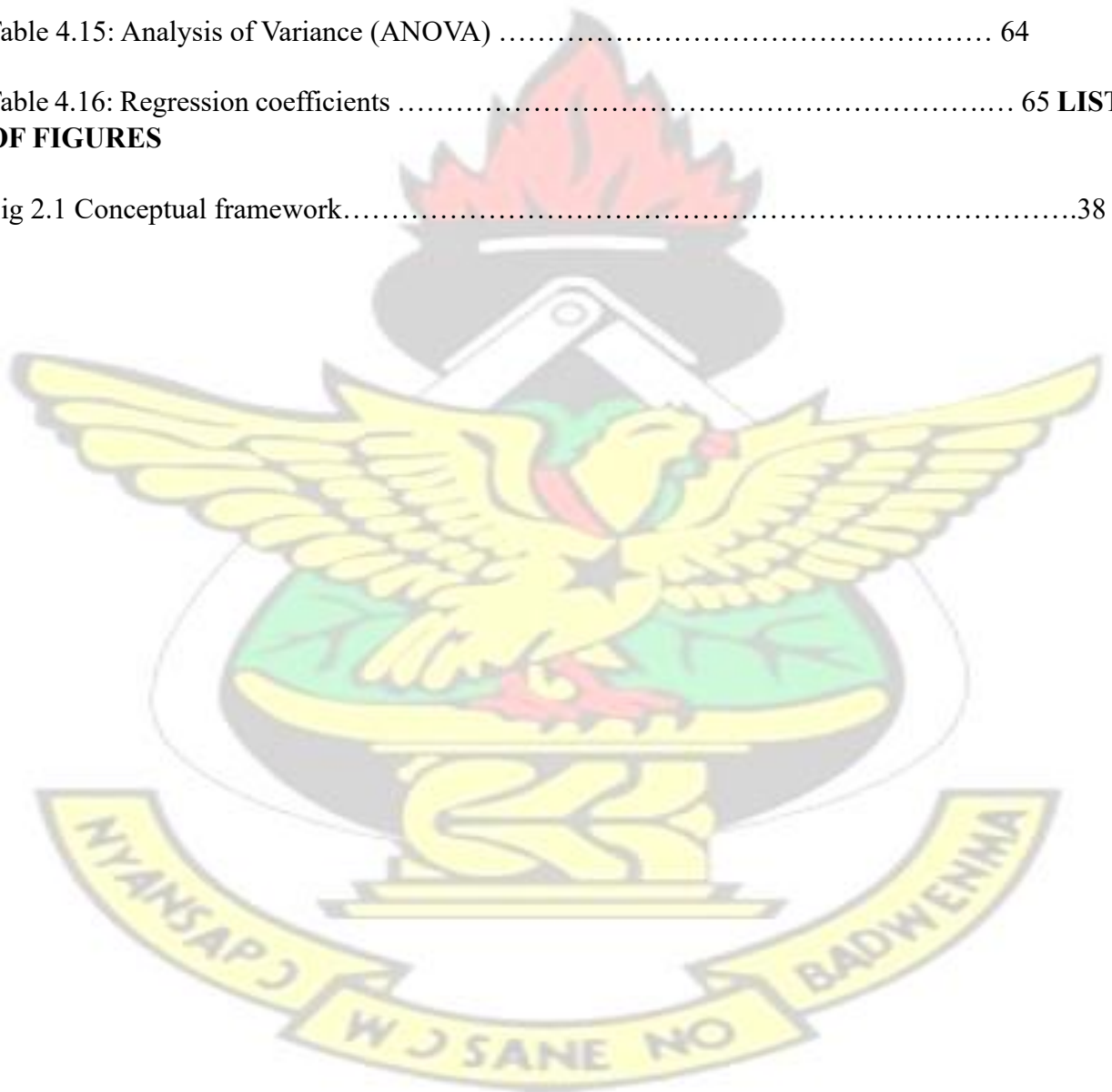
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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

E-procurement is a technologically driven system used to purchase goods and services, utilizing electronic tools and technologies to integrate procurement processes. This integration is intended to ensure the efficiency and effectiveness of order and payment systems while improving supply chain systems and facilitating purchases over the Internet and other information networks. Being an Internet-based system, it facilitates the acquisition of goods and services, offers electronic order processing as a means of optimizing the procurement process, and enhances various administrative functions of both buyers and suppliers. The main objectives are to reflect on performance and explore the possibility of cost savings in the organizational context (Sanewu Esther Nasidai, 2016). E-Procurement has triggered a substantial transformation within global procurement by enabling goods and services to be procured on agreed terms from qualified suppliers globally to benefit organizations (Cevdet et al., 2013). The adoption of e-procurement is acknowledged for its brevity, noteworthy impact, and collaborative nature in enhancing project management and supply chain systems (Saleh, 2018). It enables organisations to source for goods and services, negotiate and order from qualified suppliers, receive and review orders and ensure the accuracy of supplies using an internet-based system (Addison, 2017). The use of e-procurement reduces the cost per transaction by 65% and enable an achievement of 42% savings out of purchases of materials and equipment required for efficient and effective operations (Adebanjo et al., 2010). Panda and Sahu

(2012) assert that e-procurement serves as a catalyst for realizing the objectives of public sector procurement with enhanced efficiency and effectiveness. According to the Public Procurement Act (2016) of Ghana, the acquisition of products and services in the public sector must adhere to the principle of obtaining them at the lowest possible cost while ensuring no compromise to quality. The Act requires that public sector organisations benefit from the quality and cost-efficient products and services as may be required towards sustainable operations (Peprah et al., 2018). The Procurement Act plays a crucial role in unifying the procurement processes employed within the public service. Its primary objectives are to facilitate the judicious and efficient utilization of state resources, while concurrently fostering fairness, transparency, and non-discrimination in all public procurement activities. The Act mandates that public procurement organizations adhere to the principles of acquiring optimal products and services in the appropriate quantity, of superior quality, and delivered promptly and designated location. This framework is designed to ensure that society at large can derive tangible and extensive benefits from the procurement process (Public Procurement Act, 2016).

Public sector organisations undertake public services of which the acquisition of goods and services forms part of their core operations. The operations of these organisations which generally are to provide public goods and services must be undertaken in a productive and reliable and environmentally friendly manner to benefit stakeholders (Sparrevik, et al., 2018). Public sector organisations are required to ensure quality, efficiency, productivity, profitability and sustainability of which procurement practices become relevant to attain these results. According to the Ministry of Finance (2017), the principal objective of procurement activities is to attain the acquisition of

goods and services at the prescribed quantity and quality, while optimizing cost and time efficiency, This is achieved through efficient procurement processes that enable the right quality procurement, right quantity requirement, efficient pricing system, right time and place and right source by making sure that the source of delivery of the purchased has meets all the requirements financially and technically for the product needs (Anane et al., 2019).

According to Asare and Prempeh (2017), procurement practices contribute to the overall operations of organisations as it enables goods and services to be procured to meet specification from qualified suppliers. Procurement represents a substantial proportion, accounting for 20% of the total expenditures incurred on a global scale. In light of this substantial impact, stakeholders advocate for reform in the regulatory and institutional frameworks governing procurement practices. The objective of these reforms is to cultivate a professional environment that upholds principles of transparency, accountability, and fairness in the execution of procurement activities within public sector organizations (Jibrin et al., 2014). In adherence to the global benchmarks set for procurement practices and the specific objectives outlined in the Procurement Act 663 of 2003, e-procurement has become necessary to be implemented by public sector organisations in their operations.

E-procurement presents immense potential for public sector institutions, serving as a catalyst for facilitating business-to-business (B2B) purchase transactions involving materials and services (Vaidya et al., 2016). Efficient e-procurement practices hold the potential to mitigate the higher expenditure allocation associated with the procurement of goods and services within public sector organizations. By implementing such practices, these entities can introduce flexibility in managing

the supply of quality products and large-scale purchases through tendering processes. This enables the selection of qualified suppliers transparently, contributing to cost-reduction (Gligor et al., 2012). The high expenditure component among the public sector organisations which leads to the consistent deficit national budget and the need for the acquisition of quality goods and services towards sustainable performance within the public sector organisations, serves as a primary motivating factor behind the selection of this research topic which is to determine the effect of procurement practices on the performance of public sector organisations (Onyango, 2012).

1.2 Problem Statement

Application of e-procurement results in internal integration and collaboration in getting value for money supplies at the time and quantity needed to ensure the continuation of services and also in meeting the demands of customers (Costa et al., 2013). According to Panda and Sahu, (2012), eprocurement application leads to value for money within organizations. When it comes to the need to tender, source, order, and auction within an organization, e-procurement is the surest way to consider and to address any corrupt practice and misuse of power (Panda and Sahu, 2012). Developed nations employ the practices of e-procurement to reduce their overall cost relating to the operations in the public sector. Sweden reduced up to 30% of its public sector cost which is one of the cost components through the application of e-procurement as well as other Proceedings of the International Multi-conference on Computer Science and Technology in 2009). However, this has less applicable within the emerging nations resulting in the continuous high-cost component as always identified among the expense category of most national budgets with regards

to public sector expenses. Further studies are required on e-procurement in developing nations to appreciate and implement e-procurement as most of the studies were undertaken in developed nations (Nhuvira, 2021).

The implementation of e-procurement requires significant financial investments by the government to acquire the necessary equipment essential for supporting e-procurement operations and to train staff towards efficient application. According to the Gartner group (2009), the global ascent of information technology (IT) has paved the way for the recognition and subsequent adoption of e-procurement implementation. This is evidenced by a noteworthy expenditure of \$3.2 trillion, reflecting a 5.2% decrease from the preceding year's expenditures of \$3.4 trillion in 2008 despite its widely recognized benefit as encouraged by scholars for adoption (Hsu et al., 2004). The absence of essential facilities and adequately trained personnel poses a significant challenge for developing nations, impeding their ability to harness the benefits of E-procurement implementation. Consequently, these nations often find themselves constrained by traditional procurement systems characterized by various limitations and unprofessionalism among staff members (Nasidai, 2016).

The country Ghana has encountered persistent challenges in its efforts to address the vulnerabilities and fraudulent activities prevalent in the realm of public procurement. According to a report by the World Bank (2014), a substantial portion of Ghana's budget, ranging from 50% to 70%, is allocated towards procurement-related expenditures after accounting for personal emoluments, resulting in a continuous deficit budget. The key stakeholders implicated in these dynamics include politicians, public servants, clients, consultants, contractors, and suppliers.

E-procurement application mitigates the weakness associated with the traditional procurement system (Peprah, Brako, and Akosah, (2018). The several attempts of the Ghanaian government's e-government initiatives whereby procurement-related activities can be handled through the practices of e-procurement has just been a mere attempt as its realization is yet to be felt and implemented by the procurement authority. Due to the inability to implement e-procurement as promised by government, the several benefits associated with which includes reducing cost, officials becoming efficient and effective, officials becoming transparent and visible are not attained (Cevdet et al., 2013).

The primary objective of e-procurement is to optimize the purchasing process by facilitating costeffective procurement of high-quality materials and the fair and judicious award of contracts and studies on e-procurement and its impact especially on the public sector organisations remains relevant. This necessitated the choice of the study to determine the effect of procurement practices on the performance of public sector organisations.

1.3 Objectives of the Study

The general objective of the study is to evaluate the influence of e-procurement on public sector operations: A case study of selected outfit in Accra metropolis.

- i. To evaluate the influence of e-tendering on organizational performance. ii.
- To assess the influence of e-auctioning on organizational performance iii.
- To determine the influence of e-purchasing on organizational performance.

1.4 Research Questions

- i. What is the influence of e-tendering on organizational performance?
- ii. What is the influence of e-auctioning on organizational performance?
- iii. What is the influence of e-purchasing on organizational performance?

1.5 Justification/Significance

The operations of public sector organisations demand significant financial resources, constituting a substantial portion of the expenditure allocation within the national budget. Consequently, this allocation raises concerns among stakeholders regarding the utilization and management of public resources. The current study holds substantial significance in elucidating the impact of Eprocurement adoption on the operational dynamics of public sector entities. The study not only contributes to the existing body of literature on E-procurement but also advances knowledge in the field by examining the implications of its implementation. Additionally, it serves as a valuable resource for policymakers in both the private and public sectors, providing insights that can shape and enhance procurement practices through the effective adoption of e-Procurement in business activities.

1.6 Overview of Research Methodology

Research methodology encompasses the holistic design and procedural framework of a study, thereby facilitating the systematic collection of data grounded in theoretical foundations and enabling subsequent analysis (Schommer-Aikins et al., 2003). The methodology entails the

integration of theoretical and philosophical assumptions that underpin the study, enabling the utilization of large-scale data for reliable generalization of research findings, as outlined by Kutzin (2001). This study will utilize structured questionnaires as the primary data collection instrument, employing purposive or convenience sampling techniques to acquire data in a targeted manner. The questionnaire will be designed in alignment with the predefined objectives and administered to a selected group of respondents who possess relevant information about the study's stated objectives. The sample size will comprise staff members from various departments involved in the acquisition of goods and services within the public sector. The collected data will be transferred to SPSS software for advanced analysis, organizing it into tabular a format using Microsoft Excel. Furthermore, careful consideration will be given to aspects of reliability, validity, and ethical considerations throughout the course of the research.

1.7 Scope of Study

The study aims to evaluate the influence of e-procurement on public sector operations within Accra Metropolis. The scope of the current study includes the theoretical scope which is made up of research publications and student papers relating to procurement practices on the performance of public sector organizations. Geographically, it will be limited to public sector organizations within the Accra Metropolis.

1.8 Limitation of the Study

The study will be limited in its population to only selected outfit in Accra metropolis to generalize the conclusion to all the public sector organisations. The need for primary data through the administration of questionnaires to the selected respondents within the selected public sector organisations within Accra metropolis may pose some challenges. There may be a constraint with time and finance to meet the deadline since it is an academic thesis and it has to meet a given duration. Despite the limitation, the student researcher will be able to generate the data necessary to meet the objectives of the study.

1.9 Organisation of the Study

To ensure a coherent and structured presentation of concepts, the research is organized into five chapters. The initial chapter begins with an introduction and a concise problem statement, the purpose of the study, objectives, methodology, limitations, and an outline of the study's organization. Chapter Two focuses on a comprehensive literature review, providing a theoretical framework that underpins the study's subject matter. Chapter Three of this study delves into the research methodology, comprising key components such as the research philosophy, research method, research design, population, data collection techniques and analysis. Chapter Four presents a thorough analysis of the research findings in a comprehensive manner. Chapter Five serves as the concluding segment of the study, offering a succinct summary of the study's outcomes. It highlights the conclusions derived from the analysis and provides pertinent recommendations based on the research findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter includes the conceptual, theoretical, and empirical reviews, as well as the development of the study's conceptual and theoretical framework. The conceptual review elucidates the essence of public procurement, public procurement operations, e-procurement, eprocurement adoption, and factors affecting e-procurement. The theoretical review section critically analyses the philosophical context and ramifications of relevant theories pertinent to the study, while the empirical research section examines existing literature and studies related to the subject matter. This holds considerable significance to ensure the optimal efficiency and effectiveness of procurement processes within public sector organizations.

2.2 Conceptual Review

The conceptual review illuminates the relevant concepts associated with the research topic, encompassing key factors, variables, and theoretical constructs that bear relevance to the study. Presented below is the comprehensive conceptual review of the study.

2.2.1 Concept of Public Procurement

The concept of public procurement relates to the need for the acquisition of goods and other services in public organisations. Public procurement enables public organisations to purchase goods and services, negotiate for the effective prices, undertake procurement contracts, control inventory, dispose of waste and other related functions including the delivery of products and

services (Nzau and Njeru, 2014). The concept of public procurement is to ascertain a cost-efficient procurement of goods and services as procurement forms the highest part of the expenses of most governments which is about 20% of global expenditures of government globally (Mlinga, 2009). The heavy cost element in the purchasing of goods and services and other expenses reflect in the national budget of some of these nations leaving a continuous deficit budget and for that matter the need to reduce such heavy cost and sustain development especially within African countries in a more transparent manner (World Bank, 2013).

According to Asare and Prempeh (2017), procurement operations contribute to the overall operations of organisations as it enables goods and services to be procured to meet specification from qualified suppliers. This comes with a high cost of expenditure in the public sector of nations. To ensure an effective procurement practice, nations enact procurement Acts to promote coherence, stimulate competitiveness, optimize efficiency, ensure transparency, accountability, and foster prudent resource utilization. These legislative measures aim to facilitate streamlined procurement administration and guarantee value for money in public procurement processes.

The nation Ghana for instance depends heavily on the importation of goods and services which for the past years affect the economy and has made the local currency to loss value before other major currency. Procurement relating only to the public sector constitutes about 24% of total importation into the nation and also about 50-70% of the national budget (World Bank CPAR, 2003). The higher funds allocated to the procurement of public expenditure also increase the corrupt practices of officials which constitute approximately \$148 billion and for that matter needed to be handled through e-procurement to protect the public purse. The public procurement Act therefore aims to

achieve harmonization of public procurement processes especially within the public sector, promote responsible and optimal allocation of the nation's resources and ensure that public procurement is transparent, impartial and fair.

2.2.2 Public Procurement Operations in Ghana

Procurement in Ghana represents 24% of the total importation and 50-70% of the total expenses incurred on procurement at in public sector with 14% of GDP (Adjei, 2005). Public sector organisations undertake procurement operations that forms part of the expenditure component of the national budget of most developing nations including Ghana (Anane et al., 2019). This happens as the public sector remains the major employer of the human resources and the procurement practices within the public sector organisations enable goods and services to be purchased for effective and efficient services within the public sector organisations. The procurement practices implemented by public organizations in Ghana align with the requirements set outlined in Procurement Acts. These practices involve meticulous planning of the procurement process, careful budgetary allocation and judicious utilization of financial resources, solicitation of bids from external firms, rigorous evaluation of the bidding process, contract awarding to qualified contractors, meticulous contract management, performance measurement, and effective monitoring and auditing measures (Anane et al., 2019). The Public Procurement Act, 2003 (Act 663) has established the public procurement Authority to handle procurement-related issues in the public sector as well as the tendering committees and Tendering Review Boards. Issues relating to procurement that are enforceable by law are being authorized by the Public Procurement Act, of

2003 (Act 663). The Act also establishes the framework to ensure openness and responsibility within the public sector procurement system.

2.2.3 E-procurement

The adoption of electronic procurement, commonly known as e-procurement, has garnered attention owing to its commendable attributes of efficiency, flexibility, and effectiveness in the realm of procurement practices. The significance of this undertaking stems from the substantial reliance of organizations, both in the public and private sectors, on procurement practices as a vital aspect of their operational endeavors. Consequently, adherence to the concept of e-procurement becomes imperative for organizations to attain optimal outcomes and derive maximum benefits from their procurement activities.

The concept of E-procurement is associated with the utilization of electronic data transfer to facilitate and streamline procurement activities. The concept of e-procurement entails the utilization of digital platforms, electronic communication channels, advanced technological tools, and various operational tasks involved in the procurement process. This includes activities such as information retrieval and acquisition, supplier identification and evaluation, negotiation and contract formation, as well as receipt and post-review procedures within the e-procurement domain (Brandon-Jones and Kauppi, 2018). The concept of e-procurement pertains to the digitalization of an organization's purchasing activities, encompassing processes such as supplier search, supplier selection, communication with procurement stakeholders, contract awarding, and the timely delivery of goods and services in adherence to the organization's specifications (Kademaunga and

Phiri, 2019). The concept relies on the use of electronic devices to facilitate engagement among the stakeholders involved in procurement operations, as well as to support ancillary activities necessary for achieving a successful procurement process. The emergence of electronic procurement as a concept stemmed from the need to address the inefficiencies, errors, and other forms of misconduct associated with traditional manual procurement practices. The adoption of the concept was evident through the implementation of electronic data interchange (EDI) during the period spanning from the 1960s to the 1990s.

2.2.3.1 E-Tendering

Electronic tendering, also known as e-tendering, refers to the procurement process conducted exclusively through online platforms. It involves the seamless management of the complete tendering cycle, commencing from the advertisement of the notice and culminating in the issuance of an award (Sunmola and Shehu, 2020). According to Raventos and Zolezzi (2015), e-tendering is defined as the electronic reception and submission of all tender-related information and documentation through the Internet. It involves electronic publishing, communication, and access, thereby replacing conventional paper-based tender processes and enabling a streamlined and optimized business process for all parties involved. E-tendering provides a centralized mechanism that enables organizations to enhance operational efficiencies and foster accountability, resulting in a reduction of conventional tendering expenses (Raventos and Zolezzi, 2015). The e-tendering process involves various stages, such as supplier registration/expression of interest, contract download, bid document submission, and tender evaluation.

According to Mali et al. (2020), e-tendering is a growing and evolving system that is accessible to organizations in both the public and private sectors for the streamlined acquisition of goods and services. It serves as a means for the efficient procurement of goods and services. The adoption of e-tendering has experienced substantial growth in both public jurisdictions and private organizations worldwide, leading to enhanced efficiency and transparency in procurement processes (Mali et al., 2020). The fundamental functionalities of e-tendering facilitate the streamlining of the tendering process for both buyers and suppliers. It simplifies the task of suppliers in identifying relevant tenders of interest and provides them with immediate access to all essential documents and amendments required for the preparation of a comprehensive bid proposal.

According to Sunmola and Shehu (2020), e-tendering facilitates buyers in the seamless posting of notices and all corresponding documents on online platforms. The system promptly notifies suppliers, ensuring their access to a comprehensive bid set comprising all necessary associated documents. It makes it possible for information relating to tendering processes to be tracked with a full audit trail that enables disputes to be resolved. It facilitates a simplified participation process for organizations and individuals engaged in contract bidding, thereby enhancing their accessibility to tendering procedures. According to Zanker et al (2019), the digital communication established between foreign tendering systems enables any interested organization to effectively submit a bid and receive a response from the competent contracting authority.

Electronic tendering comes with several benefits for tenderers and contracting authorities. The benefits associated with e-tendering include equal access to all procurements, value-for-money

maximization through transparency of tender procedures, accuracy, consistency, security within the procurement process, integrated and re-usable tender documents as well as reduced time, efforts and costs of documents transfer (Kajewski and Weippert, 2004).

Admittedly, e-tendering has brought transformation into procurement practices within both public and private sector organizations. The reliance of the use of ICT and other online activities has brought flexibility in tendering. This also enables the tracking of services and goods which has become helpful in ensuring transparency and efficiency as may be required and also reducing the cost component of organizations (Zanker et al., 2019).

Attention has been given to the application of e-tendering and it is an application, especially in the public sector. This has brought various researchers in seeking to know the impact of e-tendering in the procurement system of organizations. This is necessary especially in this era of global adoption of e-procurement practices. Ibem and Laryea (2017) arrived after the imperative of eprocurement adoption within organizations following an examination that scrutinized the adoption of procurement practices in the public sector of Ghana. The study recommended that organizations should aim to decrease operational costs, expedite transactional processes, and capitalize on economies of scale to minimize expenditures and maximize profitability.

Altayyar and Beaumont-Kerridge (2016) conducted a study in Saudi Arabia to assess the impact of e-procurement implementation on small and medium-sized enterprises (SMEs). The study aimed to determine the benefits derived by SMEs as a result of adopting e-procurement practices. The study yielded positive findings regarding the contribution of e-procurement and highlighted various external factors that are crucial for enhancing the management of e-procurement practices.

The study offers additional insights into the importance of ensuring security, reliability, high-speed internet connectivity, and alternative communication channels to foster collaboration among procurement stakeholders, thereby ensuring higher returns.

Osir (2016) conducted a study in Kenya to identify the diverse determinants influencing eprocurement within organizations. The study identified several factors including, emphasizing the significance of comprehensive staff training to address the human resource aspect of organizations and the necessity of skill acquisition and training for effective procurement practices.

2.2.3.2 E-Auctioning and Invoicing

Electronic auctioning (e-auctioning) is an electronic commerce technology that is used for trading merchandise and services across a global electronic marketplace using web services (Puustjärvi 2007).

According to Khan et al (2012), electronic auctions are elements of electronic commerce that utilize the Internet for procurement purposes. These online models, including forward auction and reverse auction, have gained popularity in the retail and online purchasing of products and services. The efficacy of these digital auction models depends on important factors such as secure payment mechanisms and measures to foster trust and credibility.

E-auctioning has become an increasingly prevalent mechanism for both organizations and individuals. According to (Puustjärvi 2007), the popularity of electronic auctions is a result of an improved electronic commerce development thus gaining widespread approval. The Internet offers a highly efficient platform for the dissemination of market information and the facilitation of

auctions, resulting in significant cost savings in terms of administrative expenses. Online auctions offer a flexible cost structure that is contingent upon the interplay between supply and demand, subject to specific competitive conditions. As a result, these digital marketplaces effectively coordinate the matching of demand and supply through the determination of market clearing prices, thus facilitating the optimal sale of a maximum number of products.

Auctions represent a prevalent economic activity regularly undertaken by numerous individuals daily. There is a need for an upgrade into e-auction to realize the full effect of it. According to Brandon-Jones (2017), the reasons for adopting e-auctioning is to resolve inconveniences associated with auctioning processes. The process of traditional auctions often presents inconveniences to bidders, as they are required to physically attend a specific location and register before participating. Furthermore, bidders frequently encounter information asymmetry, with limited knowledge about the goods, the seller, and other products offered by the seller. Time inefficiency is another challenge, as manual auctions involve the physical presence of an auctioneer at the venue, leading to significant time consumption (Brandon-Jones, 2017). Bidders are limited to one auction at a time and have geographical constraints.

The e-auction however comes with many advantages. According to Puustjärvi (2007), the benefits of e-auctioning include convenience by which there is no need to go any place before participating in auction but even in the comfort of an individual's office or home. e-auction grants access to detailed information. The buyer has the opportunity to thoroughly examine the item's details, review payment terms and conditions, and assess the seller's feedback rating. It also facilitates access to information on other items being offered for sale by the same seller. E-auction results

into time saving. It saves time and also enables individual bidders to make several choices. The bidder has a multitude of options for items, including the choice to view identical or related items. It is done within a wide geographical area which means that individuals can take part in auction even when items sellers are from different countries. Adoption of e-auctioning result into the reduction of paper work and also complexity (Puustjärvi 2007).

According to the white paper report on electronic invoicing in Italy, electronic invoicing (e-invoicing) has emerged as a pivotal catalyst in facilitating the digital transformation across both public administration and economic sectors. It offers substantial benefits, including the reduction of administrative burdens and the provision of innovative services to businesses (Poel et al., 2016). Organizations, both public and private, worldwide are increasingly adopting e-invoicing to deter illicit practices, enhance tax and other business services, and leverage its potential to expedite processing cycles, including tax recovery (Poel et al., 2016). Moreover, e-invoicing mitigates the risk of human error, reduces transaction costs associated with printing and storage, contributes to the fight against fraudulent behavior, and promotes economic modernization and technological advancements through the extensive utilization of communication technologies, digital signatures, and service development (OECD, 2017).

According to a study by Matyskevic, and Kremer-Matyskevic (2020), the global market for e-invoicing and enablement is projected to have a value of 3.3 billion euros in 2017 and is expected to grow to 16.1 billion euros by 2024. E-invoicing plays a crucial role in accomplishing strategic objectives, such as facilitating public expenditure tracking (in the case of business-to-government e-invoices), ensuring the authenticity of tax-related data for suppliers, enabling prompt fraud

detection, providing services for streamlined declaration processes by organizations, reducing the need for post-declaration audits, enhancing pre-declaration comparisons, automating business accounting and administrative tasks to minimize costs and errors, and expediting the invoicing payment cycle (Matyskevic, and Kremer-Matyskevic, 2020).

According to Koch, (2017), the implementation of e-invoicing brings about a heightened level of efficiency and effectiveness in the invoicing process through the adoption of an electronic system. However, the success of e-invoicing projects is influenced by various factors, one of which is the significance of having a knowledgeable and skilled workforce. Hernandez-ortega and jimenezmartinez (2013) concluded on e-invoicing as leading to the performance of Spanish firms. There is the need for competency of staff in all categories of an organization to undertake e-invoicing and this has to do with the ability to transform the operations of an organization and to enable an organization to be chosen among competitors. Barsemoi et al. (2014) reached a conclusion highlighting the insufficient awareness and understanding of e-procurement among personnel, particularly in relation to procurement regulations and the imperative of achieving value for money.

Penttinen and hyytiainen (2008) consider the Adoption of electronic invoicing in Finnish Private and Public Organizations as important and this requires the need for competency of staff in invoicing to position them in undertaking e-invoicing effectively to the advantage of their organizations.

2.3 Theoretical Review

Theoretical review entails an examination of relevant theories pertaining to the study's subject area and highlights their applicability and significance. It presents theories that lend support to the specific research being conducted. The institutional theory, principal-agent theory and the Etechnology perspective theory are used in this study.

2.6.1 E-Technology Perspective Theory

This theory requires the need for an efficient operation of organizations to attain the needed value for money results so as to enhance the operations of organizations and to reduce any practices which have the potential of reducing the yield of an organization through higher cost (Min and Galle, 1999). This theory has become relevant especially considering the fact that most modern organizations employ the use of online operations and other electronic services. The modern nature of businesses enables the operation of virtual platform businesses. This platform makes it possible for some companies not to invest solely into infrastructure but rather to invest into the usage of technology in the provision of just-in-time supplies to needed customers (Barratt and Rosdahl, 2002). The online marketing which has today taken the better marketing shape has enable most companies to advertise their products online and for shopping to be made online in such a manner as customer's can be reached without any burial and services can be given them to meet their satisfaction.

The E-technology is seen as having advantage over the traditional form of businesses. The highcost component as associated with transaction and the misrepresentation of material facts is limited as

the use of technology has enabled organization to capture their operations on the machines and assigned responsibilities to employees whose machines are also connected to the data base system to enable tracking of operations and for any malfeasance to be easily detected Min and Galle, 1999). The Enterprise Resource planning services has become efficient through the usage of ICT which ensure accountability, transparency and efficiency as may be required in undertaking a transaction.

2.6.2 Transaction Cost Theory

This theory maintains its relevance in upholding the principle of value for money, which is highly sought after by public officials. Frequently, the level of cost reduction in transactional activities within an organization serves as an indicator of effective management and the organization's potential for generating higher profits. In many organizations, particularly those operating within the public sector, the costs incurred often surpass the benefits derived from their operations (Dedrick et al., 2008). The mismanagement of resources leads to an ongoing demand for additional resources, resulting in additional costs. Moreover, the accounting system often inflates figures related to purchased items and external services, further exacerbating the situation. The severity of the issue lies in the prevalence of corrupt practices among officials, leading to a lack of transparency in their dealings. These officials prioritize personal interests over the welfare of the organizations they represent (Dedrick et al., (2008).

2.4 Empirical Review

Empirical reviews contain the review of previous literatures that relates to the topic under consideration. This enables the researcher to appreciate the findings and methods used by previous researchers on the subject. It empirical relates to the conclusion from prior studies on the subject. The empirical review on efficiencies and effectiveness of procurement and supply chain includes the following:

Basara et al. (2017) conducted a study to examine the impact of e-Procurement on the organizational performance of County Governments in Kenya. The study utilized a combination of simple random sampling and purposive sampling techniques, and the primary data was collected through the administration of questionnaires. Furthermore, a case study research design was employed, focusing on employees from the procurement departments of Bungoma County Government, with a total sample size of 150 individuals. The study found e-procurement as having positive effect on performance of organizations and it plays an important role in achieving an organization's goals.

Masudin et al., (2021) undertakes a study to find the impact of e-Procurement adoption on company performance. The researchers conducted a pilot test using questionnaires to assess the respondents' comprehension of the provided questions. The final questionnaire was then subjected to statistical analysis using Statistical Package for Social Science (SPSS) version 21 and Smart PLS v3.0 software to examine the relationships between variables. The findings of the study revealed a significant impact of e-procurement implementation on company performance.

Altayyar and Beaumont-Kerridge (2016) conducted a study in Saudi Arabia to assess the impact of e-procurement implementation on small and medium-sized enterprises (SMEs). The study aimed to determine the benefits derived by SMEs as a result of adopting e-procurement practices. The study yielded positive findings regarding the contribution of e-procurement and highlighted various external factors that are crucial for enhancing the management of e-procurement practices. The study offers additional insights into the importance of ensuring security, reliability, high-speed internet connectivity, and alternative communication channels to foster collaboration among procurement stakeholders, thereby ensuring higher returns.

Panda and Sahu, (2012) conducted a study on E-Procurement implementation by critically analyzing its success factors and its impact on the outcome of a project. It concluded on the need for government of nations to adopt the use of e-procurement in undertaking their projects as that will make them to be cost efficient and to get quality of products to be used to meet the specified period for their projects.

Hannah and Nani (2021) conducted a study examining the necessity of implementing eprocurement in the municipal assemblies of Ghana. The findings revealed that none of the assemblies have made substantial investments in e-procurement and the required internet tools to enhance performance. This aligns with Owusu's (2015) assessment of the preparedness of public procurement entities in Ghana for the implementation of e-procurement.

Adoption of e-procurement gains an organization competitive advantage as evidence that organization is providing efficient services to its customers as compared with their competitors.

Oketch and Moronge (2016) conducted a study to find the factors that influence the deployment of e-procurement in Kenyan state enterprises under the Ministry of Finance. According to the findings of the study, the implementation of e-procurement in the public sector is impeded by the insufficient competency of personnel and the presence of an inadequate regulatory framework, which hinders the seamless adoption of e-procurement practices.

The integration of electronic procurement (e-procurement) in the public sector of Ghana presents a promising and efficient avenue for augmenting procurement processes, thereby facilitating effectiveness and efficiency and reducing overhead costs associated with contract assignment by public sector entities. Bondzi (2010) concluded that the utilization of online procurement enables greater participation of service providers, fostering healthy competition and ultimately resulting in improved delivery time. Moreover, it facilitates a continuous and streamlined business operation for the government.

2.5 Conceptual Framework

Conceptual framework is a diagram that shows the variables that will be considered in a particular study and how the variables relate to the objectives of a study.

The framework below displays e-procurement operations at the public sector organisations and how it can result into operational performance. The independent variables include e-tendering, e-auction, e-purchasing and e-invoicing. The dependent variable is organization performance.

E- Procurement

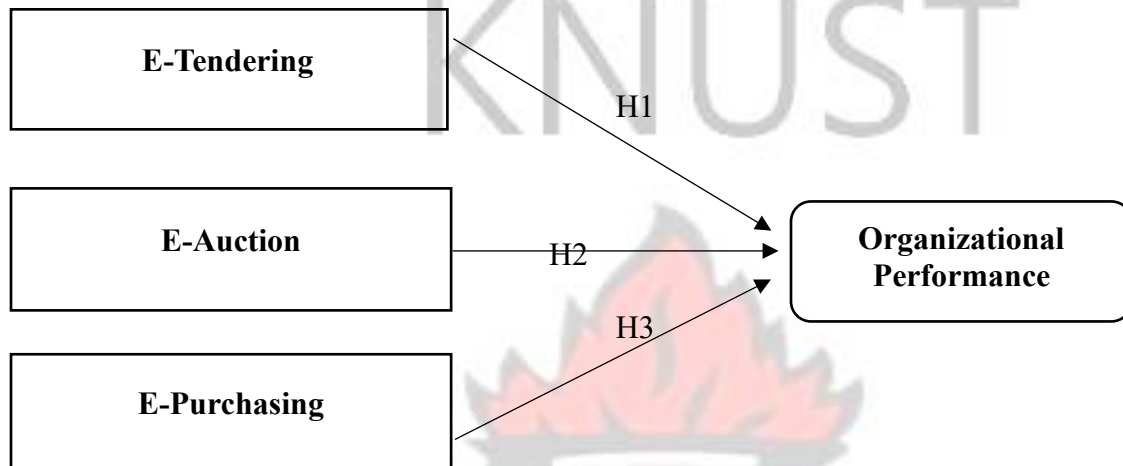


Fig.2.1 conceptual framework

Source: Basara et al. (2017)

2.6 Hypothesis Development

2.6.1 E-tendering on Organizational Performance

Empirical studies have shed light on the impact of e-tendering on organizational performance. Basara et al (2017) conducted a study in Kenya, revealing that e-tendering positively influences the performance of county governments. Utilizing a mix of sampling techniques and questionnaires, the study emphasized the pivotal role of e-tendering in achieving organizational goals. Masudin et al (2021) extended this perspective, focusing on the impact of e-tendering adoption on company performance. Their findings, based on statistical analyses, affirmed a significant positive relationship between e-tendering implementation and company performance.

Altayyar and Beaumont-Kerridge (2016) explored the effects of e-tendering implementation on small and medium-sized enterprises (SMEs) in Saudi Arabia. Positive outcomes were identified, highlighting the benefits reaped by SMEs through the adoption of e-tendering practices. Additionally, Panda and Sahu (2012) stressed the cost-efficiency and quality advantages of e-tendering in government projects, emphasizing its role in meeting project deadlines.

Hannah and Nani's (2021) study in Ghana and Oketch and Moronge's (2016) investigation in Kenyan state enterprises underscored the competitive advantage gained through e-tendering adoption. The findings highlighted impediments, such as inadequate regulatory frameworks and personnel competency, affecting the seamless adoption of e-tendering practices in the public sector. Based on the discussion above, the study proposes that;

H1: E-tendering has a positive influence on organizational performance

2.6.2 E-purchasing on Organizational Performance

Reviewing empirical literature on e-purchasing and organizational performance, studies provide valuable insights. Basara et al (2017) revealed a positive impact on the performance of Kenyan county governments, emphasizing its role in achieving organizational goals. Masudin et al (2021) further supported this, demonstrating a significant impact of e-purchasing adoption on company performance through statistical analyses.

Altayyar and Beaumont-Kerridge (2016) explored the effects in Saudi Arabia, emphasizing the positive impact of e-purchasing on small and medium-sized enterprises (SMEs). The study highlighted the benefits derived by SMEs and underscored the importance of factors such as

security and high-speed internet connectivity for successful e-purchasing implementation. Panda and Sahu (2012) focused on e-purchasing in government projects, emphasizing its success factors for cost efficiency and quality outcomes. In Ghana, Hannah and Nani's (2021) study highlighted the necessity of e-purchasing implementation in municipal assemblies for improved performance. Overall, these studies collectively support the notion that e-purchasing positively influences organizational performance, provided certain critical success factors are addressed.

Based on the discussion above, the study proposes that;

H2: E-purchasing has a positive influence on organizational performance

2.6.3 E-Auctioning on Organizational Performance

Examining the empirical evidence on e-auctioning and organizational performance, studies offer valuable insights. Basara et al (2017) found positive effects of e-auctioning on the performance of county governments in Kenya, emphasizing its role in achieving organizational goals. Masudin et al (2021) reinforced this by establishing a significant impact of e-auctioning adoption on company performance through statistical analyses.

Altayyar and Beaumont-Kerridge (2016) provided insights from Saudi Arabia, revealing the positive impact of e-auctioning on small and medium-sized enterprises (SMEs). The study highlighted the benefits derived by SMEs and emphasized the importance of factors such as security and high-speed internet connectivity for successful e-auctioning implementation.

Panda and Sahu (2012) emphasized the success factors of e-auctioning in government projects, advocating for its adoption to enhance cost efficiency and quality outcomes. Meanwhile, Hannah

and Nani's (2021) study in Ghana showcased the necessity of e-auctioning implementation in municipal assemblies for improved performance. Based on the discussion above, the study proposes that;

H3: E-auctioning has a positive influence on organizational performance



CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter offers an in-depth exploration of the research methods used in the study, providing a solid framework that enables the attainment of research questions and objectives. The primary aim of this research is to undertake a systematic and meticulous examination and analysis, driven by the primary objective of advancing knowledge in the field (Kothari, 2004). This chapter covers the research design, the study population, data sources, data analysis tools, and touches upon aspects of reliability, validity, and ethical considerations.

3.2 Research design

The research design refers to all the various components and activities involved in the selection of participants, data collection, and other essential aspects that constitute a specific research process (Sanders, 2019). According to Mesly (2015), it encompasses the identification and utilization of data sources, data collection procedures, and research instruments employed by a researcher within a specific study. The study will utilize a descriptive research design to define the population and achieve the objectives. Cross-sectional data analysis, focusing on data collected at a specific moment in time, will be utilized.

3.3 Research method

The research method entails underlying assumptions, fundamental principles, and procedural guidelines within a specific framework (Hill, 2012). The research method encompasses the techniques employed by a researcher to conduct their research (Diriwächter and Valsiner, 2006). It includes various aspects such as data collection methods and the calculation of specific results (Levin et al., 2003). The research will use quantitative method, specifically the survey method, as selected by the researcher. Questionnaires will be conducted by the researcher to a selected sample of respondents representing diverse organizations within the Accra metropolis. The research will also incorporate a descriptive case study approach to facilitate a comprehensive analysis of the structure and implementation mechanisms of e-procurement and its impact on cost-effectiveness.

3.4 Study population

Murthy and Bhojanna (2010) define a research population to consists of a collection of cases that satisfy specific criteria. It represents the group of interest from which the researcher aims to draw generalizable conclusions. In quantitative research, as defined by Creswell (2012), the population refers to the entire set of respondents who can give information to obtain the stated objectives. The population elements include employees within an organization, as identified by Onwuegbuzie and Leech et al., (2005) for this study, the researcher focused on a selected group of staff members from a particular organization in the Accra metropolis who possess the necessary insights into the operations of the public sector. The population of the study includes selected outfits in Accra metropolis. This consists of staff members from health institutions, tertiary institutions, and the

Ministry of Agriculture. Based on estimations, the projected population size is expected to range in the thousands.

3.5 Sample Size and sampling technique

Sample refers to the entire group from which inferences can be drawn to a broader population (Mugenda and Mugenda, 2003). In the context of determining the sample size for a study involving a well-defined population, it is imperative to establish a specific table that aids in determining appropriate sample sizes (Mesly 2015). The researcher selected a sample size of one hundred (100) for the study: Hundred (50) from Tertiary Institutions, Fifty (25) from Health Service Centres, and Fifty (25) from the Ministry of Agriculture.

ORGANIZATIONS	SAMPLE SIZE DISTRIBUTION	The proportion of Sample of Distributions
Tertiary Institutions	50	50%
Health Service Centres	25	25%
Ministry of Agriculture	25	25%
TOTAL		100%

The researcher will use De vaus (2016) technology to ascertain the sample size for the study.

The formula is expressed as follows:

$$n = \frac{N}{I+N(a)^2}$$

From the above,

n = the sample size of the study.

N = the population of the study. α

= the significant level.

3.6 Data Collection Methods

Primary and secondary data sources are widely recognized as the two predominant sources of data in research (Murthy and Bhojanna, 2010). According to Johnson and Turner (2003), data collection methods include a range of techniques, one of which is the use of questionnaires. The study intends to use primary data which makes use of new data derived through questionnaires, interviews, and fieldwork (Mesly, 2015). The data collection process involves the use of structured questionnaires, enabling respondents to indicate their responses through a 5-point Likert scale. This scale encompasses a range from "strongly disagree" (1) to "strongly agree" (5) about the statements presented on the questionnaires.

3.7 Data Processing and Analysis

According to Diriwachter and Valsiner (2006), after data collection, the researcher needs to engage in the process of data reduction in order to facilitate appropriate analysis. In the current study, upon collection of the administered questionnaires from the participants, the data will be obtained, organized, and entered into the computer system. The application of SPSS software will enable the examination of the obtained findings. Descriptive and inferential statistics, primarily involving means and standard deviation (SD), will be utilized. Furthermore, frequency tables will be used to enhance the clarity of the outcomes and facilitate discussions.

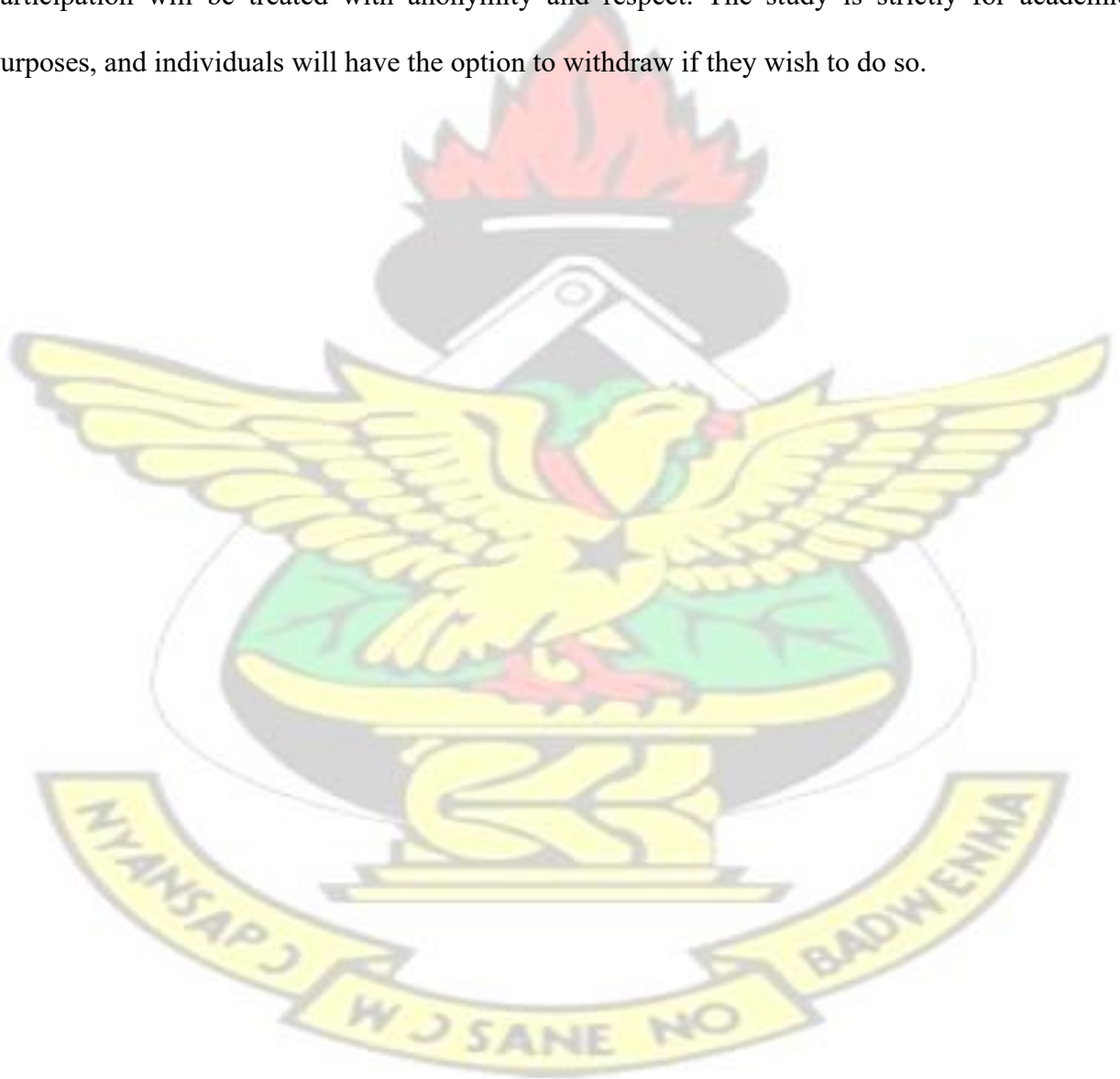
3.8 Validity and reliability tests

Lancaster et al. (2012) emphasized the importance of precision and consistency in research, as these factors contribute to the reliability and validity of the study. This necessitates the consideration of both internal and external validity to ensure the overall validity of the study. The validity of the research instrument pertains to the extent to which the chosen research method effectively measures the intended constructs with consistency and accuracy. The concept of research validity can be understood as the extent to which the fundamental principles of scientific research methodology have been followed during the generation of research outcomes. According to Oliver (2010), validity is regarded as a crucial requirement for any type or design of research, irrespective of its nature or structure. Emphasizes the strong correlation between reliability issues and subjectivity, suggesting that the adoption of a subjective approach by a researcher compromises the level of reliability in their study. Cohen et al. (2017) outline different types of research validity, classifying them as content validity, criterion-related validity, construct validity, internal validity, external validity, concurrent validity, and face validity.

3.8 Ethical consideration

In research, the disclosure of information is deemed morally improper. As a measure to uphold ethical standards, participants will be provided with assurance regarding the confidentiality of their information. Respondents will be assured of the confidentiality of their disclosed information, and their participation will be treated with anonymity and respect. The study is strictly for academic

purposes, and individuals will have the option to withdraw if they wish to do so. In research, the disclosure of information is deemed morally improper. As a measure to uphold ethical standards, participants will be provided with assurance regarding the confidentiality of their information. Respondents will be assured of the confidentiality of their disclosed information, and their participation will be treated with anonymity and respect. The study is strictly for academic purposes, and individuals will have the option to withdraw if they wish to do so.



CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0. Introduction

This chapter presents the analysis, presentation, and interpretation of findings derived from the collected data. It encompasses an examination of the demographic characteristics of the participants and aligns the findings with the research objectives. The data for this study was gathered from a sample size comprising one hundred (100) participants.

4.1. Demographic Characteristics of the Respondents

The demographic characteristics enable the researcher to gain an understanding of the participants' profile, as almost all the variables of the respondents such as age and educational attainment are known to influence the choices that people make regarding issues that are relevant to their lives. Demographic data is necessary for determining whether the respondents represent the targeted population.

4.1.1. Respondents' Distribution

Table 4.1: Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Gender		
Male	82	82%
Female	18	18%
Age Group		
20 – 30 years	32	32%
31 – 40 years	54	54%
41 – 50 years	8	8%
51 – 60 years	6	6%
Level of Education		
HND	12	12%
Degree	20	20%
Master's Degree	30	30%
Professional Qualification	38	38%
Position		
Directors of procurement	18	18%
Procurement managers	29	29%
Store managers	46	46%
Administrative managers	7	7%
Years of Experience		
Less than 1 year	10	10%
1 – 3 years	16	16%
4 – 6 years	20	20%
7 – 9 years	24	24%

Source: Author's survey, 2021.

According to the data presented in Table 4.1, it is observed that 82% (82) of the respondents are identified as males, while the remaining 18% (18) are females. These findings indicate a significant male dominance within the selected outfit in the Accra Metropolis.

Furthermore, based on Table 4.1, it is evident that 32% (32) of the respondents belong to the age range of 20-30 years. The majority, accounting for 54% (54) of the respondents, fall within the 31-40 age group. Additionally, 8% (8) of the respondents are in the 41-50 years age group, while 6% (6) of the respondents are between 51-60 years old. These results suggest that a considerable portion of the respondents are situated within the middle age group and could hold a longer tenure of office and also contribute to the performance of their organizations when given the needed resources.

According to the data presented in Table 4.1 above, it is observed that 28% (28) of the total respondents possessed a higher National Diploma education, whereas 46% (46) of the respondents held a university degree. Furthermore, 14% (14) of the respondents reported having a master's education, while the remaining 12% (12) had a professional education. This suggests that the entire sample of respondents possessed an advanced level of education, indicating a comprehensive understanding of procurement matters. Based on the data provided in Table 4.1 above, it is evident that among the respondents, 18% (18) held positions as directors of procurement. Procurement managers accounted for 29% (29) of the respondents, while 46% (46) of the participants were store

managers. The remaining 7% (7) of the respondents were employed in the administration department.

Based on the data presented in Table 4.1 above, it can be observed that 10% (10) of the respondents possessed less than 1 year of experience. Additionally, 16% (16) of the participants reported having between 1 year of experience. Moreover, 20% (20) of the respondents indicated having between 4-6 years of experience. A total of 24% (24) of the participants had between 7 to 9 years of experience. Finally, the remaining 30% (30) of the respondents boasted over 10 years of experience.

4.2. Reliability and Validity Test

This section provides an overview of the conducted reliability and validity tests, aiming to assess the dependability and accuracy of the collected data for potential replication in diverse scenarios. Reliability and validity tests, as defined by Golareshani (2003), evaluate the extent to which a method, test, or construct effectively measures its intended target. Accordingly, this section encompasses a comprehensive evaluation of the reliability and validity of the study's constructs. The Cronbach alpha method was selected as the primary approach for conducting the reliability and validity tests. According to the Cronbach alpha criterion, a construct must attain a score of 0.7 or higher to be deemed reliable and valid. Conversely, any construct scoring below 0.7 is considered unreliable, necessitating the removal of one or two items associated with the construct to enhance its validity and reliability. The findings obtained from the reliability and validity tests are presented below. Electronic tendering had a Cronbach alpha score of 0.976. Electronic

purchasing had a Cronbach alpha score of 0.952. Electronic auctioning and invoicing had a Cronbach alpha score of .960. Operational performance had a Cronbach alpha score of .940. The test showed that the data was reliable.

Table 4.2: Reliability Analysis

Constructs	No. of Items	Cronbach's Alpha
Electronic tendering	4	.976
Electronic purchasing	5	.952
Electronic auctioning and invoicing	4	.960
Operational performance	5	.940

Source: Field Survey, 2023

4.3 Descriptive Statistics

E-procurement is the electronic means of undertaking procurement practices within organizations which contributes to the overall operations of organizations and also enables goods and services to be procured from suppliers on agreed terms. The respondents were asked to rate e-procurement practices which were presented in a Likert level scale based on strongly disagree to strongly agree.

4.3.1 Electronic Tendering

Based on the data presented in Table 4.3 below, the assessment of electronic tendering was measured on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The calculated mean value of 4.40, coupled with a standard deviation of 1.155, suggests that the respondents generally expressed agreement regarding the organization adopts electronic tendering to access relevant information. Again, the respondents generally expressed agreement regarding the implementation of e-tendering practices in their organizations, leading to the attainment of cost-efficient and quality goods and services. Moreover, the respondents generally expressed agreement regarding the facilitation of the tender shortlisting process through the implementation of electronic tendering in their respective organizations and lastly, the respondents generally expressed agreement regarding the advantages gained from accountable procurement through the implementation of electronic tendering in their respective organizations.

Table 4.3. Electronic Tendering

Items	N	Min.	Max.	Mean	Std. Deviation
My organization adopts electronic tendering to access relevant information	100	1	5	4.40	1.155
My organization uses competitive tendering to procure cost-efficient and quality goods and services	100	1	5	4.66	0.768

My organization practices e-tendering which makes it easy to short list tenders	100	1	5	4.66	0.768
Electronic tendering practices enables my organization to benefit from accountable procurement of goods and services	100	1	5	4.56	0.967

Source: Field survey, 2023

4.3.2 Electronic Purchasing

Electronic purchasing enables procurement organizations to procure goods and services through electronic means from suppliers and to also make goods reach other users. Responses on electronic purchases are presented in Table 4.4. Based on the data provided in Table 4.3.2 below, the assessment of electronic purchasing was conducted using a scale ranging from 1 (representing strongly disagree) to 5 (representing strongly agree). The computed mean value of 4.66, along with a standard deviation of 0.768, implies that the respondents generally expressed agreement regarding the organization undertakes e-purchasing practices to easily call for proposal. Again, the respondents generally expressed agreement regarding the organization adopts e-purchasing to improve its information flow and undertakes e-purchasing to be able to share relevant information with its suppliers. Moreover, the respondents generally agreement with the positive influence of e-purchasing practices within their respective organizations, leading to the timely supply of goods. The results imply that the respondents generally agreed that e-purchasing results in timely supply of goods and lastly, the respondents generally expressed agreement regarding the ability of epurchasing to effectively address issues that hinder distribution.

Table 4.4 Electronic Purchasing

Items	N	Min.	Max.	Mean	Std. Deviation
My organization undertakes e-purchasing practices to easily call for proposal	100	1	5	4.66	0.768
My organization adopts e-purchasing to improve its information flow	100	1	5	4.66	0.768
My organization undertakes e-purchasing to be able to share relevant information with its suppliers	100	1	5	4.68	0.737
Distribution means are stated as a result of epurchasing to enable supply of goods at the time they are needed	100	1	5	4.76	0.474
My organization adopts e-purchasing to address issues that could hinder distribution and better logistics means are employed	100	1	5	4.70	0.503

4.3.3 Electronic Auctioning

Electronic auctioning and invoicing are relevant in undertaking procurement activities and to enable transparency in organizations thereby attaining value for money goods and services.

Responses on electronic auctioning and invoicing are presented in Table 4.3.3. Based upon the result from Table 4.5 below, electronic auctioning and invoicing make my organization benefit from shorter auction ranging from 1, representing strongly disagree to 5, representing strongly agree. The mean value of 4.16 with a standard deviation of 0.866 implies that the respondents generally agreed that electronic auctioning and invoicing make organizations to benefit from shorter auction and also, makes organizations to benefit from competitive bidding. Again, the respondents generally agreed electronic auctioning and invoicing enable payment to be timely in their respective organizations and lastly, makes transaction cost to be reduced in their organization.

Table 4.5 Electronic Auctioning

Items	N	Min.	Max.	Mean	Std. Deviation
My organization benefits from shorter auction	100	1	5	4.16	0.866
Electronic auctioning enables my organization to benefit from competitive bidding	100	1	5	4.23	0.855
Payment is timely in my organization as a result of e-invoicing practices	100	1	5	4.26	0.899
Transaction cost is reduced in my organization for practicing e-invoicing	100	1	5	4.35	0.799

4.4.4 Operational Performance

Responses on operational performance is presented in table 4.6 .

Operational performance considers the performance of systems and processes and to determine the needed improvements in both functional and operational areas. From table 4.6 below, improved upon efficiency ranged from 1, representing strongly disagree to 5, representing strongly agree. The mean value of 4.62 with a standard deviation of .982 implies that the respondents generally agreed that e-procurement has resulted into operational performance making it possible to improve upon efficiency in the organizations. Again, the respondents generally agreed that eprocurement adoption results into value for money procurement within the respective organizations and improvement in services within the organizations. Moreover, the respondents generally agreed that the organization has increased its procurement capacity over the years.

Table 4.6. Operational performance

Items	N	Min.	Max.	Mean	Std. Deviation
My organization undertakes e-procurement to improve upon its efficiency over the years	100	1	5	4.62	0.982
My organization has been effective in its operations in the past years	100	1	5	4.88	0.327
My organization has obtained value for money procurement of goods and services over the years	100	1	5	4.64	0.905
My organisation has improved upon its services over the years	100	1	5	3.74	1.528

My organisation has increased its procurement capacity over the years	100	1	5	3.54	1.520
-----------------------------------------------------------------------	-----	---	---	------	-------

4.4 Correlation Analysis

The table below displays the correlation between the different variables. The correlation analysis was used to determine the strength and direction or nature of the linear relationship between the variables considered in the study. The results indicate that all three predictor variables; electronic tendering, electronic auctioning and electronic purchasing have a strong positive relation with operational performance. The correlation coefficients of electronic tendering, electronic auctioning and electronic purchasing were 0.497, 0.520 and 0.308 respectively, and are statistically significant at 1% levels of significance with operational performance. The findings of the study indicate a noteworthy positive correlation ($r = 0.497$, $p < .001$) between the electronic tendering and operational performance, suggesting that electronic tendering is positively linked to operational performance. The findings further indicate a statistically significant positive correlation between electronic auctioning and operational performance. There also exists a noteworthy positive correlation between electronic purchasing and operational performance, as indicated by a correlation coefficient of 0.308 and a p-value of less than 0.01.

Table 4-7: Correlation Analysis

		Tendering	Auctioning	Purchasing	Performance
Tendering	Pearson	1	.838**	.370**	.497**
	Correlation				
	Sig. (2-tailed)		.000	.000	
	N	99	99	99	.000
					99
Auctioning	Pearson	.838**	1	.413**	.520**
	Correlation				
	Sig. (2-tailed)	.000		.000	
	N	99	99	99	.000
					99
Purchasing	Pearson	.370**	.413**	1	.308**
	Correlation				
	Sig. (2-tailed)	.000	.000		
	N	99	99	99	.002
					99
Performance	Pearson	.497**	.520**	.308**	1
	Correlation				
	Sig. (2-tailed)	.000	.000	.002	
	N	99	99	99	
					99

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

4.5 Regression Analysis

Regression analysis estimates the difference between the variables both dependent and independent. This enables the relationship between the variables and its significance to be realized in a particular study.

4.5.1 E-tendering and operational performance

The first goal is to assess ET influence on OP. The research examined ET-OP relationships using linear regression. Tables 4.8–4.10 show regression findings. Table 4.8 presents the model summary, R-square (which indicates prediction accuracy), estimate error, and regression analysis data. $R=0.497$ and $R\text{ Square}=0.247$ at 0.05. ET is projected to make up 24.7% of OP with an R^2 Square of 0.247. ET and OP connected positively (see Table 4.8).

Table 4.8 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.497 ^a	.247	.239	.50982

a. Predictors: (Constant), Electronic Tendering

Source: Field Data (2023)

The probability value of 0.000 indicates the significance of the regression connection in predicting how ET will affect OP. At a 5% degree of importance, the F value was 31.760. See Table 4.9 for evidence of the model's overall significance.

Table 4.9 Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.255	1	8.255	31.760	.000 ^b

Residual	25.212	97	.260
Total	33.467	98	

a. Operational Performance (OP): Dependent Variable

b. Electronic Tendering (ET): Predictors (Constant)

Source: Field Data (2023)

ET and OP are found to be significant in Table 4.10 ($B = 2.562$, $t = 8.307$, $P = 0.000$, and $\text{Sig} < 0.05$). Because the path coefficient was positive and the p-value for H1 was less than 0.05, ET had a positive effect on OP. ET improves OP. When ET increases by one unit, it is anticipated that OP will rise by 40.8%.

Table 4.10: Regression coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.562	.308		8.307	.000
	ET	.408	.072	.497	5.636	.000
a. Dependent Variable: OP						

Source: Field Data (2023)

4.5.2 Effect of electronic auctioning on operational performance

The second objective is to assess EA influence on OP. The research examined EA-OP relationships using linear regression. Tables 4.11–4.13 show regression findings. Table 4.11 presents the model summary, R-square (which indicates prediction accuracy), estimate error, and regression analysis data. $R=0.520$ and $R\text{ Square}=0.270$ at 0.05. EA is projected to make up 27% of OP with an R^2 Square of 0.270. EA and OP connected positively (see Table 4.11).

Table 4.11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.520 ^a	.270	.262	.50185
a. Predictors: (Constant), Electronic Auctioning				

Source: Field Data (2023)

The probability value of 0.000 indicates the significance of the regression connection in predicting how EA will affect OP. At a 5% degree of importance, the F value was 35.880. See Table 4.12 for evidence of the model's overall significance.

Table 4.12: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.037	1	9.037	35.880	.000 ^b

Residual	24.430	97	.252
Total	33.467	98	

a. Operational Performance (OP): Dependent Variable

b. Electronic Auctioning (EA): Predictors (Constant)

Source: Field Data (2023)

EA and OP are found to be significant in Table 4.13 ($B = 0.429$, $t = 79.37$, $P = 0.000$, and $\text{Sig} < 0.05$). Because the path coefficient was positive and the p-value for H2 was less than 0.05, EA had a positive effect on OP. EA improves OP. When EA increases by one unit, it is anticipated that OP will rise by 42.9%.

Table 4.13: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.451	.309		7.937	.000
	EA	.429	.072	.520	5.990	.000

a. Dependent Variable: OP

Source: Field Data (2023)

4.5.3 Effect of electronic purchasing on operational performance

The third objective is to assess EA influence on OP. The research examined EP-OP relationships using linear regression. Tables 4.14–4.16 show regression findings. Table 4.14 presents the model

summary, R-square (which indicates prediction accuracy), estimate error, and regression analysis data. $R=0.520$ and $R\text{ Square}=0.270$ at 0.05. EP is projected to make up 27% of OP with an R^2 Square of 0.270. EP and OP connected positively (see Table 4.14).

Table 4.14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.308 ^a	.095	.086	.55883

a. Predictors: (Constant), Electronic Purchasing

Source: Field Data (2023)

The probability value of 0.000 indicates the significance of the regression connection in predicting how EP will affect OP. At a 5% degree of importance, the F value was 10.167. See Table 4.15 for evidence of the model's overall significance.

Table 4.15: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.175	1	3.175	10.167	.002 ^b

Residual	30.292	97	.312
Total	33.467	98	

a. Operational Performance (OP): Dependent Variable

b. Electronic Purchasing (EP): Predictors (Constant)

Source: Field Data (2023)

EP and OP are found to be significant in Table 4.16 ($B = 0.227$, $t = 3.189$, $P = 0.002$, and $\text{Sig} < 0.05$). Because the path coefficient was positive and the p-value for H3 was less than 0.05, EP had a positive effect on OP. EP improves OP. When EP increases by one unit, it is anticipated that OP will rise by 22.7%.

Table 4.16: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.308	.309		10.713	.000
	EP	.227	.071	.308	3.189	.002
a. Dependent Variable: OP						

Source: Field Data (2023)

4.6 Discussion of Results

4.6.1 E-tendering on Organizational Performance

The regression analysis for E-tendering reveals a robust model with a significant multiple correlation coefficient (R) of .995 and a high coefficient of determination (R²) at 99%. This implies a strong correlation among the variables, suggesting that E-tendering, along with electronic purchasing and auctioning, significantly explains 99% of the variance in effectiveness and efficiency in procurement practices. The ANOVA results further support the model's adequacy, indicating that at least one of the independent variables (E-tendering, electronic purchasing, electronic auctioning, and invoicing) significantly impacts organizational performance.

The strong correlation and significant impact of E-tendering on organizational performance align with existing literature. Basara et al. (2017) conducted a study in Kenya, finding that eProcurement, including e-tendering, had a positive effect on the performance of county governments. The implementation of e-tendering was shown to play a crucial role in achieving organizational goals. Masudin et al. (2021) complement these findings, highlighting the positive impact of e-Procurement adoption on company performance. Their study emphasizes the importance of electronic methods, such as e-tendering, in enhancing organizational efficiency and effectiveness in procurement practices.

4.6.2 E-Purchasing on Organizational Performance

The analysis of E-purchasing's impact on organizational performance echoes the findings of the previous models. The high R and R² values signify a strong correlation among the variables and

highlight E-purchasing's substantial explanatory power in the context of procurement practices. The ANOVA results confirm the overall significance of the model, indicating that at least one of the independent variables, including E-purchasing, significantly affects organizational performance. The individual coefficients in the regression table underscore the positive and significant relationships between procurement planning and the performance dimension with the effectiveness and efficiency in procurement practices.

The findings regarding E-purchasing's impact on organizational performance are consistent with literature. The study by Basara et al. (2017) in Kenya and Masudin et al.'s (2021) research on eProcurement adoption both highlight the positive effects of e-purchasing on organizational performance. These studies collectively emphasize the crucial role of electronic purchasing in achieving organizational goals and improving overall efficiency in procurement practices. The literature also supports the idea that proper planning, as indicated by the procurement planning variable, is essential for the success of e-Procurement initiatives. Panda and Sahu's (2012) study on E-Procurement implementation underscores the importance of strategic planning for the success of projects, aligning with the positive relationship found in the regression model.

4.6.3 E-Auctioning on Organizational Performance

Similar to E-tendering, the E-Auctioning regression model exhibits a strong correlation among the variables ($R = .995$) and a high coefficient of determination ($R^2 = 99\%$). The ANOVA table reinforces the statistical significance of the model, indicating that at least one independent variable, including E-Auctioning, significantly influences organizational performance. The individual

coefficients in the regression table emphasize the positive and significant relationships between procurement planning and the performance dimension with the effectiveness and efficiency in procurement practices.

The literature supports the positive outcomes observed in the E-Auctioning model. Basara et al.'s (2017) study in Kenya is relevant here, as it emphasizes the positive impact of e-Procurement, including e-auctioning, on the performance of county governments. The study underscores the role of electronic methods in achieving organizational goals. Moreover, studies by Altayyar and Beaumont-Kerridge (2016) in Saudi Arabia shed light on the benefits of e-Procurement practices, including e-auctioning, for small and medium-sized enterprises (SMEs). This supports the notion that electronic auctioning contributes positively to organizational performance, particularly for SMEs.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary of findings, conclusions drawn and recommendations on the effect of e-procurement on public sector operations: a case study of selected outfit in Accra metropolis. The main objective is to evaluate the effect of e-procurement on public sector operations: A study of selected outfit in Accra metropolis.

5.2. Summary of Findings

The study used quantitative survey data method to derive data from one hundred (100) respondents. The study established that the e-procurement practices of the selected organisations are electronic tendering, electronic purchasing, electronic auctioning and invoicing. The study confirmed that the adoption of e-procurement serves as a guiding framework for the implementation of e-procurement processes, thereby enhancing its effectiveness. Furthermore, the adoption of e-procurement facilitated cost management and integration of organizational services. The study also revealed that organizations derived significant benefits from the adoption of eprocurement, particularly in terms of value-for-money supply of goods.

The following findings were discovered based upon the specific objectives.

5.2.1 E-tendering and Operational Performance

The study also found that e-tendering has a significant impact on the operational aspect of organizations, specifically in terms of delivery time. Additionally, it was established that e-tendering facilitates seamless supplier engagement.

5.2.2 E-purchasing and Operational Performance

The study also revealed that electronic purchasing enables procurement organisations to procure goods and services through electronic means from suppliers and to also make goods to reach other users. E-purchasing helps to easily call for proposal, improve information flow, helps to share relevant information and results into timely supply of goods. electronic auctioning and invoicing. The study determined that e-purchase positively impacts the time of delivery of goods within the

organization. Furthermore, it was revealed that e-ordering facilitates the expression of interest and significantly influences the delivery time.

5.2.3 E-Auctioning and Operational Performance

The study established that electronic auctioning and invoicing are relevant in undertaking procurement activities and to enable transparency in organisations thereby attaining value for money goods and services. It helps the organizations to benefits from shorter auction, benefit from competitive bidding and timely payment within the selected organizations.

5.3. Conclusion

Based upon the findings, the study concludes that, e-procurement practices include electronic tendering, electronic purchasing and electronic auctioning and invoicing. The practices of etendering encompassed various aspects, such as e-bidding, which had an influence on delivery time. Additionally, e-payment played a crucial role in ensuring value for money. Furthermore, the implementation of e-informing practices also contributed to achieving value for money. Moreover, the presence of ICT experts within the organization played a vital role in facilitating these etendering practices. The study also establishes that there is an effect of e-procurement practices on public sector operation. This is realized through quality and cost efficiency, timeliness and improvement in communication. The study revealed a notable and meaningful correlation between performance and e-procurement practices, specifically e-tendering. This indicates that as eprocurement practices, including e-tendering, are adopted more extensively, there is an improvement in performance.

5.4. Recommendations

5.4.1 E-Tendering and Operational Performance

Organizations should prioritize the implementation of user-friendly e-tendering platforms to streamline operational processes. Investing in training programs for both procurement personnel and suppliers will enhance engagement and ensure seamless utilization of e-tendering systems. Continuous monitoring and evaluation of e-tendering processes can identify areas for improvement, optimizing delivery time. Establishing collaborative communication channels within the platform can foster effective supplier engagement, contributing to overall operational efficiency.

Policy frameworks should encourage standardization of e-tendering processes to enhance transparency and efficiency in procurement activities. Policymakers should collaborate with industry experts to ensure regulations support the adoption of user-friendly e-tendering platforms. Incentivizing organizations to implement and adhere to best practices in e-tendering can be incorporated into regulatory measures, promoting the attainment of value-for-money goods and services. Policies should also emphasize the importance of timely and transparent payment processes within selected organizations.

5.4.2 E-Purchasing and Operational Performance

Organizations should invest in comprehensive training programs to ensure that procurement personnel are proficient in utilizing e-purchasing platforms. Implementing user-friendly interfaces and providing detailed information on e-purchasing platforms can enhance the efficiency of

procurement processes. Organizations should regularly assess and update their e-purchasing systems to align with technological advancements, improving information flow and communication. Encouraging suppliers to participate in electronic means of procurement will further streamline the call for proposals and contribute to timely supply of goods.

Policy frameworks should emphasize the standardization of electronic purchasing processes to ensure seamless information flow and efficient procurement operations. Policymakers should collaborate with industry stakeholders to create regulations that support the integration of electronic means in procurement activities. Incentivizing organizations to adopt and update their e-purchasing systems through regulatory measures can contribute to improved operational performance. Policies should address the importance of timely delivery of goods and the role of e-purchasing in facilitating this process.

5.4.3 E-Auctioning and Operational Performance

Organizations should prioritize the implementation of electronic auctioning and invoicing to enhance transparency and efficiency in procurement activities. Training programs for procurement personnel on the use of electronic auctioning platforms will ensure optimal utilization. Organizations should actively participate in shorter auctions and engage in competitive bidding to derive maximum benefits. Establishing streamlined payment processes within selected organizations will further enhance the operational efficiency gained through electronic auctioning. Policy frameworks should encourage the standardization of electronic auctioning and invoicing practices to ensure transparency and value for money in procurement activities. Policymakers should collaborate with industry experts to create and update regulations supporting the adoption

of electronic auctioning. Incentivizing organizations to actively participate in competitive bidding through regulatory measures can be beneficial. Policies should also emphasize the importance of timely payment within selected organizations to maximize the benefits derived from electronic auctioning.

5.4.5 Suggestion for Further Research

The limited sample size in the study was attributed to financial constraints. To enhance the reliability and generalizability of findings, future research endeavors could explore the possibility of utilizing a larger sample size. Additionally, conducting further research across all sixteen regions of Ghana would enable an examination of potential regional disparities in e-procurement practices. This investigation would provide insights into the variations and specificities of eprocurement implementation within different geographical contexts.

5.5 Theoretical Implication

The outcomes of the study, particularly the positive impact of e-tendering, e-purchasing, and e-auctioning on organizational performance, align with the E-Technology Perspective Theory and Transaction Cost Theory. The E-Technology Perspective Theory emphasizes the transformative influence of electronic technologies on organizational processes, and the study's findings underscore the significant enhancements brought about by e-procurement practices in improving efficiency, transparency, and supplier engagement. Additionally, the Transaction Cost Theory, which posits that organizations seek to minimize transaction costs, is supported as e-procurement

methods streamline processes, reduce information asymmetry, and optimize resource utilization. These theoretical implications affirm the relevance of electronic technologies in reshaping procurement practices, aligning with the core tenets of E-Technology Perspective Theory and Transaction Cost Theory.

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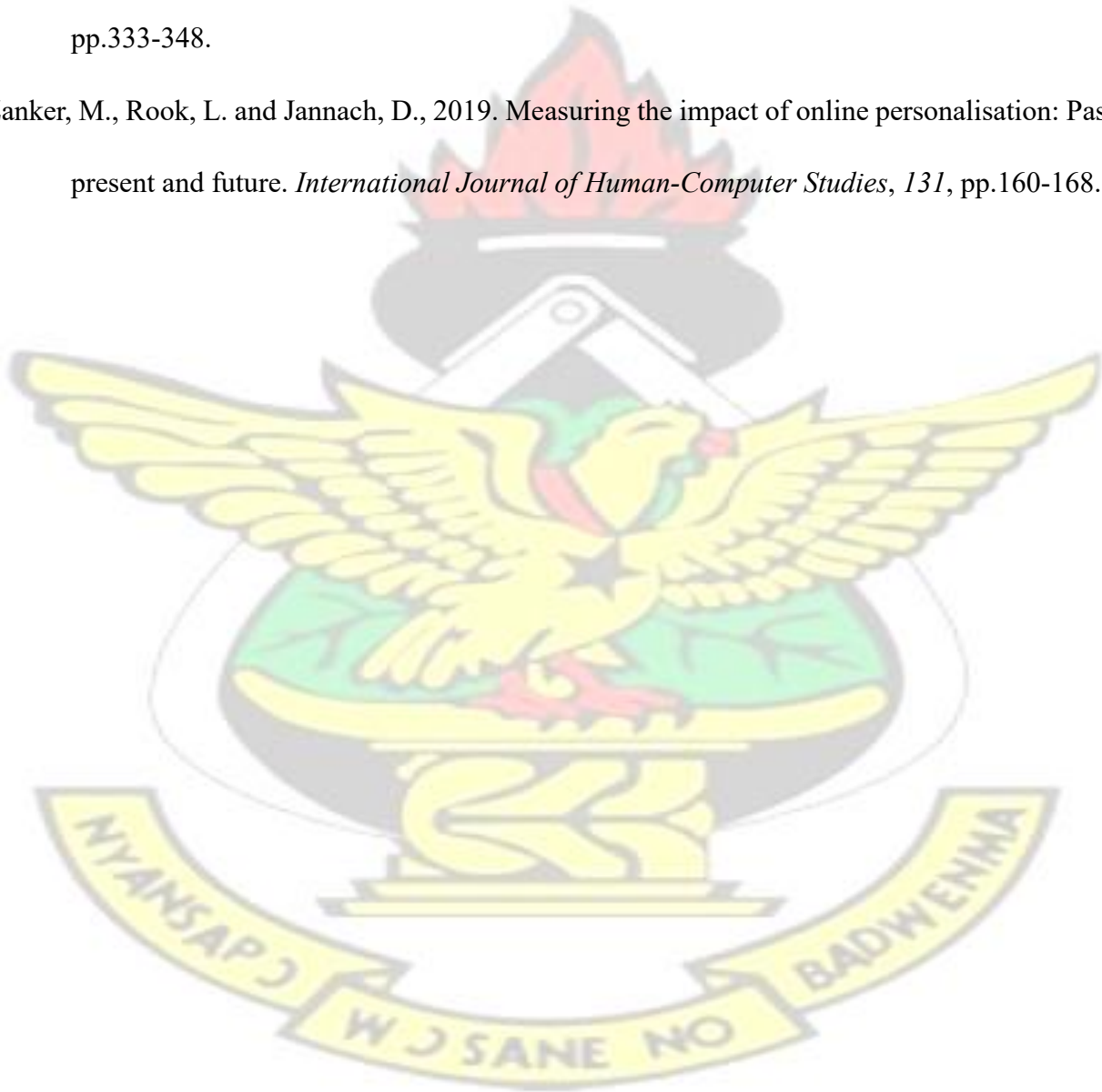
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APPENDIX 1: SURVEY QUESTIONNAIRE

I am student at the Kwame Nkrumah University of Science and Technology conducting research on the topic: **‘Evaluating the effect of e-procurement on public sector operations’: A study of selected outfits in Accra metropolis.** This is designed as part of my study toward my MSc graduation. The research is purely academic all information gathered will be treated with strict **CONFIDENTIAL.**

Please write in Ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (✓) all that apply.

A: DEMOGRAPHICS OF RESPONDENTS

1. What is your gender?

(a) Female [] (b) Male []

2. What is your age?

(a) 20 – 30 years [] (b) 31 – 40 years [] (c) 41 – 50 years []

(d) 51 and above []

3. What is your level of education?

(a) HND/Equivalents [] (b) First Degree [] (c) Master’s Degree []

(e) Professional Cert. ☐

☐ Other, please specify.....

4. Please indicate the position held in this organization.

(a) Director of Procurement (b) Procurement Manager (c) Finance Manager (d) Production Manager

(g) Other, please specify

5. Which Department or Unit of the organization do you work?

(a) Procurement ☐ (b) Stores ☐ (c) Records ☐

(d) Finance ☐ (e) Audit ☐

Other, please specify

6. How long have you worked for the organization?

(a) Less than 1 year ☐ (b) 1 – 3 years ☐ (c) 4 – 6 years ☐

(d) 7 – 9 years ☐ (d) 10 years and above ☐

SECTION B: E-PROCUREMENT PRACTICES.

Please using a scale of **1=strongly disagree; to 5=strongly agree**, how would you rate the eprocurement practices in this organization as shown in the table below:

Strongly Disagree	Disagree	Neither Disagree	Agree	nor Agree	Strongly Agree		
1	2	3	4	5	5		
<i>Please tick [✓] the extent to which you agree with the following as practiced in your firm:</i>							
PART 1 ELECTRONIC TENDERING			1	2	3	4	5
My organization adopts electronic tendering to access relevant information.							
My organization uses competitive tendering to procure costefficient and quality goods and services.							
My organization practices e-tendering which makes it easy to short list tenders.							
Electronic tendering practices enables my organization to benefit from accountable procurement of goods and services.							
PART 2: ELECTRONIC PURCHASING							
My organization undertakes e-purchasing practices to easily call for proposal.							
My organization adopts e-purchasing to improve its information flow.							
My organization undertakes e-purchasing to be able to share relevant information with its suppliers.							
Distribution means are stated as a result of e-purchasing to enable supply of goods at the time they are needed.							
My organization adopts e-purchasing to address issues that could hinder distribution and better logistics means are employed.							
PART 3: ELECTRONIC AUCTIONING AND INVOICING							
My organization benefits from shorter auction.							
Electronic auctioning enables my organization to benefit from competitive bidding.							
Payment is timely in my organization as a result of e-invoicing practices.							

Transaction cost is reduced in my organization for practicing invoicing.					
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SECTION C: ORGANIZATIONAL PERFORMANCE.

Using a scale of 1=strongly disagree; to 5=strongly agree], indicate the **organizational performance** in this organisation by rating it as shown in the table below:

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Somewhat Agree
1	2	3	4	5
<i>Please tick [✓] the extent to which you agree with the following as practiced in your firm:</i>				
OPERATIONAL PERFORMANCE				
My organization undertakes e-procurement to improve upon its efficiency over the years.				
My organization has been effective in its operations in the past years.				
My organization has obtained value for money procurement of goods and services over the years.				
My organisation has improved upon its services over the years.				
My organisation has increased its procurement capacity over the years.				

Thank for your participation in the survey.

