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EFFECT OF ELECTRONIC PROCUREMENT PRACTICES ON PROCUREMENT PERFORMANCE OF COUNTIES IN KENYA: A CASE OF SIAYA COUNTY

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A DISSERTATION SUBMITTED TO SCHOOL OF BUSINESS AND LEADERSHIP STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION (PROCUREMENT AND SUPPLY CHAIN MANAGEMENT OPTION) OF ST PAUL'S UNIVERSITY

OCTOBER, 2024

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DECLARATION

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DEDICATION

This dissertation is dedicated to my beloved mother, Florence, my husband, Charo, and to my children Telo and Kinda who gave me the drive to complete this dissertation.

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ACKNOWLEDGEMENT

To God be glory and honor for His support throughout the entire study and life. . I also express my sincere gratitude and appreciation to the following people whose support and involvement made this study a resounding success:

To my Supervisors, Dr. Mary Karei Kibuine and Dr. Akwalu Ezekiel Kiriinya for their immense inspiration and tireless review of my work and for offering a very incisive critique on this work.

To my husband who has always been my source of motivation and inspiration, for his unwavering support and encouragement throughout my academic journey. His guidance has been instrumental in shaping my character and academic success.

To my mother for her prayers, encouragement, and support, for always believing in me and pushing me to be the best version of myself. I appreciate her full financial, moral, and emotional support throughout my academic journey.

To my friends, who have been my pillars of strength and provided emotional support when needed. Your words of encouragement and motivation have been invaluable to me.

Lastly to my colleagues, who have offered valuable insights and feedback throughout my study and accorded me sufficient peace of mind at work to enable me prosper in my studies.

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ABSTRACT

In today's intense competitive business environment, keeping up with the newest technological breakthroughs is critical for firms seeking to achieve their goals. Since the introduction of electronic procurement in the mid-90s, businesses have adopted varied technologies to realize associated benefits, which include cost savings, faster processes, improved contract adherence, and increased productivity. Despite these benefits, significant barriers remain, preventing firms from fully leveraging the value proposition of electronic procurement. This study focused on electronic procurement practices and procurement performance of counties in Kenya: a case of Siaya County. The study specifically examined the effect of e-tendering, e-sourcing, e-invoicing, and e-payment on procurement performance in Siaya County. The study was anchored on the Unified Theory of Acceptance and Use of Technology and supported by Kurt Lewin's three-step change theory, and Resource Based View Theory. A descriptive research design was used to describe the status of the variables. The target population consisted of all finance, procurement, and distribution employees in Siaya County whose total number was 160. 114 respondents were drawn from this sampling frame using Yamane's formula. Data was collected using a structured questionnaire. The findings were evaluated using frequency and percentage tables. Mean and standard deviation were used to evaluate the various e-procurement techniques implemented by the county. Manipulation of data was done using SPSS (V.25). Furthermore, correlation analysis was used to assess whether the independent and dependent variables had a linear relationship. Univariate linear regression was used to predict the extent to which electronic procurement explains the procurement performance of Siaya County. The regression analysis revealed that electronic payment had the strongest positive effect on procurement performance (β_4= 1.098, t= 16.848 and p=0.000). In contrast, electronic invoicing had the weakest positive effect on procurement performance in the Siaya County Government (β_3= .425, t= 4.269 and p=0.000). The study thus concluded that electronic procurement aspects including electronic tendering, electronic sourcing, electronic invoicing, and electronic payment capability significantly explained procurement performance of the Siaya county government. The study recommended to the leadership of Siaya County government to enhance the adoption of electronic tendering capabilities, and enhance the adoption and use of electronic sourcing capabilities such as electronic perspective suppliers' identification, and electronic communication on successful bids. Further, the top leadership of Siaya County should enhance the use of electronic procurement capabilities such as electronic backing up of copies of invoices sent and received, electronic creation and transmission of invoices to clients, and electronic receipt of invoices from suppliers. Finally, Siaya County Government leadership ought to improve on the adoption of electronic payment capabilities such as online reconciliation of payments and receipts and electronic receipt of payments from clients.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variances
CIPS	Chartered Institute of Procurement & Supply Chain
EDI	Electronic Data Interchange
e-payment	Electronic payment
e-procurement	Electronic procurement
e-sourcing	Electronic sourcing
e-tendering	Electronic tendering
ERP	Enterprise Resource Planning
GDC	Geothermal Development Corporation
ICT	Information communication technology
IFMIS	Integrated Financial Management Information System
IT	Information Technology
KPIs	Key Performance Indicators
MNH	Muhimbili National Hospital
NACOSTI	National Commission of Science Technology and Innovations
NGOs	Non-governmental Organizations
OLS	Ordinary Least Squares
PLS	Partial Least Squares
PoS	Point of Sale
PPRA	Public Procurement Regulatory Authority
SMEs	Small and Medium Enterprises
SOEs	State-Owned Enterprises
SEM	Structural Equation Modeling
SCM	Supply Chain Management
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
USD	United States Dollar
UTAUT	Unified Theory of Acceptance and Use of Technology
VAT	Value Added Tax

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OPERATIONAL DEFINITION OF TERMS

Electronic Invoicing : This is the activity of submitting online invoices by billing the purchasing organization for supplied goods, completed works, and services rendered.

Electronic Payment : This is a cashless transaction method where payment is done by use of mobile money, bank transfers or by use of any other fintech processes.

Electronic Procurement : This refers to the practice and use of automated systems for an organizational procurement function.

Electronic Sourcing : This refers to the utilization of internet-based tools and decision-making support systems to source goods, communicate and manage relationships with suppliers.

Electronic Tendering : This is an activity that involves the invitation of suppliers to submit bids for the supply of goods, services and works via the website or online system of the organization.

Procurement performance : This is a measure of the procurement department's ability to acquire goods, services, and materials in a timely, cost-effective, and in a manner that ensures quality, smooth organization operations and the overall value addition to the stakeholders.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Electronic Procurement (E-procurement) has recently gained a lot of prominence in many businesses around the world due to technological improvements that have not only made operations easier and faster but also more efficient in a competitive global village (Davilla et al., 2016). The enormous changes occurring in public sector organizations operational models and marketing strategies, undoubtedly place procurement at a position where it plays a key role and influences goal achievement. Johnson et al. (2021) note that e-procurement not only offers value to the firm but also contributes to the general efficiency of the organization in performing operations.

Electronic procurement, also known as e-procurement, is the utilization of digital technology and electronic platforms to effectively oversee and simplify the procurement process (Sitompul, 2022). It encompasses the electronic transmission of procurement-related information, documents, and transactions between buyers and suppliers (Nani & Ali, 2020). E-procurement solutions harness the power of information and communication technologies (ICT) to automate and enhance a wide range of procurement activities, including requisitioning, sourcing, tendering, purchasing, invoicing, payment, and supplier management (Yu et al., 2020). ‘ E-procurement also refers to the use of internet-based search technologies to accomplish any or all of the procurement steps, such as search, source, negotiate, order, receipt, and post-purchase review (Croom, 2017).

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Globally, studies on e-procurement adoption undertaken in developed world countries revealed country disparities in e-procurement adoption. Presutti (2015) noted that companies in nations with low uncertainty avoidance, like Germany, the United States, and the United Kingdom, were quick to embrace e-procurement. In contrast, countries with higher resistance to change, such as Spain, the Netherlands, and France, had lower rates of adoption (Trekman & McCormack, 2017). Transparency International Report (2016) indicates that e-procurement has helped most developed and semi-developed countries, including Brazil and India, manage their purchasing decisions more effectively. Cummings et al. (2016) found that e-procurement in the Netherlands and France significantly improved public sector functions because all government payments were made online. Davenport (2017) reported that e-procurement was the way to go in Singapore since it allowed them to save huge amounts of money in the public sector, which they then reinvested in the economy and in an attempt to compete globally.

Research in most African countries, including Kenya, indicates that e-procurement system acceptability is still in its infancy with more work required for complete implementation (Agaba, 2017; Adebayo & Evans, 2015). Chipiro (2016), in his study, found out that in most African countries, the full advantages of e-procurement have not been fully realized yet due to a general lack of understanding of how e-procurement systems typically operate within the government environment. Further, there are othrother issues such as low levels of automation, poor information sharing between suppliers and purchasers, adversarial supplier-buyer relationships, and non-responsive supply chain integration. Locally, there have been some improvements in public

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procurement and disposal, which has been impeded for long by inadequate legislative framework and inefficiencies throughout the procurement process (Njuki, 2015).

Since the late 1990s, Kenya has been undergoing continuous procurement reforms in the public sector, resulting in a procurement process that is highly regulated through 'the Public Procurement and Disposal Act (2005)', 'the Public Procurement and Disposal Regulations (2006), and 'the Suppliers Practitioners Management Act (2007). The legislation established various independent agencies that have contributed to the evolution of Kenya's public procurement system over the years (Shalle & Amuhaya, 2017). The implementation of the Integrated Financial Management Information System (IFMIS) as the sole accounting and resource management system since 2005 has been a critical change in the government procurement system in Kenya. IFMIS is used by the government for a variety of programs, such as the e-Government Receipt Accounting System, the Electronic Payment System, and the State Public Procurement Portal (Kahari, 2015).

1.1.1 Electronic Procurement

E-procurement streamlines a company's procurement and purchasing processes by connecting buyers and sellers through relevant Information Technology (IT) platforms (Yu et al., 2020). Many companies have achieved substantial cost savings by streamlining their procurement processes. The automation of the entire procurement workflow has outperformed traditional purchase order software as it enhances organizational efficiency and streamlines procurement operations and needs (Paterne & De Dieu, 2022). The integration of cloud-based technologies into procurement has resulted in increased automation of procurement processes including contract and

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agreement management, price comparisons, product catalogue verification, and item selection have all been simplified and expedited (Kumar & Ganguly, 2021).

E-procurement as a concept has varied definitions by scholars. Nani and Ali (2020) define e-procurement as a technology solution that facilitates corporate buying using the Internet. Essentially, this is an Internet/Intranet based purchasing application or hosted service that streamlines buying, trading partners, maximizes trade efficiency across the entire supply chain, and provides strategic e-commerce capabilities in Internet time. E-procurement is a process which supports the procurement and sourcing activities via Internet technologies and enables an efficient negotiation between buyers and suppliers (Chen et al., 2021). Further, e-procurement is the automation of the procurement processes so that sourcing, vendor selection, procurement processes, shipment status tracking, and payments can be made in an online environment (Afolabi et al., 2019).

Even though there are numerous elements of e-procurement such as e-marketplace, e-tendering, e-informing, e-invoicing, e-ordering, e-catalogue and e-auction/reverse auction, the practice of e-procurement is considered one end to end solution that streamlines and integrates various elements within an organization (Sánchez-Rodríguez et al., 2019). The adoption of e-procurement in an institution often involves a mixture of any of the elements of e-procurement. The current study focused on e-tendering, e-sourcing, e-payment and e-invoicing.

The first e-procurement element considered is e-tendering. E-tendering enables firms to invite bids for the supply of goods and services and the prospective suppliers to bid for the same via the internet technology. Harianto et al. (2020) showed that e-tendering has made it possible for governments globally to save over USD. 6 Million by eliminating the

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cost incurred in printing documents and excess staff involved in procurement. Eadie et al. (2017) observed that e-tendering has made it possible for firms to lower costs and save on time in purchasing goods and services.

E-sourcing involves the utilization of internet-based tools and decision-making support systems to enhance communication between buyers and suppliers. The main objective is to identify, assess, choose, and potentially collaborate with existing and prospective suppliers, while also gathering information on their products and pricing (Greunen et al., 2019). E-sourcing leverages information and communication technology (ICT) to streamline the supplier selection process through features such as Self-service Supplier Portal modules, standardized supplier evaluation criteria, centralized access to supplier information, tailored vendor registration forms, and monitoring of supplier performance based on Key Performance Indicators (KPIs), fostering supplier diversity, and overseeing insurance certificates (Biraori, 2018).

The study also examined e-invoicing as another important aspect of e-procurement. Garrouch (2021) explained that e-invoicing is an electronic delivery and presentation of invoices to customers when goods and services are offered on credit terms. It involves system-generated bills and invoices being delivered to customers via e-mails and text messages and received by customers on their e-mails and mobile phones. E-invoicing has gained traction in various firms and organizations globally (Koch, 2019). The advent of e-invoicing has made it possible for businesses to generate and send bills rather than continue using manual invoices. Further, Eissa et al. (2016) observed that e-invoicing has enhanced VAT payments by business organizations to the tax collection agency.

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The empirical literature has also identified e-payment as another critical aspect of e-procurement. Ndunda et al. (2015) observed that e-payment is critical in achieving maximum revenue collection. E-payment is IT-based revenue collection technologies available over the digital means and the internet such as Point of Sale (PoS) machines, mobile money agents, etc. The e-payment is critical in enabling firms to avoid embezzlement of funds or revenues earned by making it possible for firms to settle their bills remotely. The business customers can comfortably send money from where they are without having to travel to the business (Fatonah et al., 2018). Further, Kumar (2019) revealed that transformations in the computer networks had improved the adoption of e-payment in purchasing.

1.1.2 Procurement Performance

Procurement performance involves measuring the procurement department's ability to acquire goods, services, and materials in a timely, cost-effective, and strategic manner while ensuring quality, compliance, and stakeholder satisfaction (Changalima et al., 2023). The evaluation of procurement performance hinges on two key elements: procurement effectiveness and procurement efficiency. Assessing performance enables an organization to gauge its progress towards predetermined objectives, pinpoint strengths and weaknesses, and strategize for future enhancements aimed at boosting performance. In essence, procurement performance serves as a tool for overseeing and regulating the effectiveness and efficiency of the procurement function (Chiappinelli, 2020). Procurement effectiveness and efficiency represent distinct competencies within the realm of the procurement function.

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Chartered Institute of Procurement & Supply Chain (CIPS) Australia (2024) distinguishes between the concepts of efficiency and effectiveness as used in procurement performance. Efficiency refers to doing things right whereas effectiveness entail doing the right thing implying that a firm can be effective and inefficient at the same time. Procurement efficiency refers to the capability of an organization's procurement department to obtain goods, services, and materials with the least amount of costs, shorter cycle times, and increased value (Ross & Yan, 2020). Procurement effectiveness pertains to how well an organization's procurement department can meet its strategic goals and provide value to the organization. Procurement effectiveness emphasizes reaching broader objectives like aiding in business expansion, managing risks, and improving stakeholder contentment (Jing et al., 2021).

Therefore, evaluating the efficiency and effectiveness of the procurement function presents various advantages to organizations such as decreased costs, higher profitability, reliable supply, enhanced quality, and a competitive edge. Thus, the adoption of e-procurement must be considered a strategic effort focused on enhancing procurement goals, such as quality, timeliness, cost-effectiveness, risk management, promoting competition, and upholding integrity (Thai, 2021). Likewise, key evaluation criteria encompass cost effectiveness, transparency and accountability, service quality, procurement cycle time, customer satisfaction, and regulatory compliance.

1.1.3 Siaya County

During the 2010 referendum, Kenyans voted to de-centralize the government creating 47 counties and voting in governors to take control of the leadership. This meant that the county government had the power to secure resources for its people (Kitewan &

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Machoka, 2021). Siaya County was one of the counties among the 47 that were separated as part of devolution. The county therefore has the mandate to carry out procurement for the running of the county. Procurement being a key function for the smooth running of the County, Siaya County leadership has had to invest in ways of ensuring proper and efficient running of the Procurement function such as the implementation of the e-procurement. Like many other counties and procuring entities, Siaya County has therefore been keen on coming up with reforms to establish a proper functioning procurement system governed by a clear framework for transparency (Abdi & Barasa, 2023).

Another core goal of procurement is to ensure that cost is cut as much as possible to ensure that an organization survives (Changalima et al., 2023) and Siaya County has therefore been keen on concentrating on the procurement function to ensure cost-effective purchases are done as much as possible so that the set budget is not surpassed. Siaya County like all the 46 others has embraced E-Procurement as part of its reforms to ensure efficient procurement. The study therefore sought to explore the effect of electronic procurement and the performance of procurement in Siaya County.

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1.2 Statement of the Problem

The use of e-procurement is generally recognized for its ability to improve supply chain efficiency and organizational productivity. However, despite government initiatives to promote e-procurement usage, substantial difficulties remain, preventing its efficient implementation. Current breakthroughs in information and communication technology (ICT) provide chances for significant changes in procurement procedures that are aligned with both short and long-term business goals (Snide & Rendon, 2018).

Siaya County government has had challenges such as corruption, funds embezzlement, pending bills and nonuse of electronic procurement. The Auditor General report of the 2021/2022 financial year revealed various incomplete projects with variances existing between the amount spent on various projects and actual work undertaken. Further, the report details that during the period under review, the county Executive spent Kshs.6,276,158 for various goods and services without using the e-procurement system. This was contrary to Regulation 49(2) of the Public Procurement and Asset Disposal Regulations, 2020 which states that the conduct of e-procurement procedures for the supply of goods, works and services shall be carried out by a procuring entity using an e-procurement system which is integrated to the State Portal (Siaya County Executive, 2022).

Extant literature highlights the significant cost saving and efficiency benefits possible with successful e-procurement processes. Rutto (2017) noted that the adaptation of information technology within state agencies had a big impact on the enhancement of service provision by forty percent and as such the need to increase the effectiveness of service provision by adopting a well-coordinated automated operation. Nonetheless, research by Rutto (2017) shows a disconnect between government support and successful adoption, particularly in the public sector, where inefficiencies persist despite technological developments.

Studies on the nexus between e-procurement and procurement performance exist in the global, regional, and local context. Candela and Ulises (2022) showed that e-tendering, e-bidding, and E-purchasing directly explained performance even though it was carried out in Argentina which has a different operating environment from Kenya. Paterne and De

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Dieu (2022) indicated that the implementation of e-procurement aspects such as e-tendering has an enhancing effect on the effectiveness of Rwandan Hospitals. However, the study was a descriptive analysis and hence could not establish the magnitude of the causal effect relationship. Further, Chepng'etich et al. (2020) revealed that e-sourcing enhanced the performance of the devolved system. However, the study was based on the performance of the devolved system rather than procurement performance. The findings of Njeru and Muthini (2023) showed that e-tendering and e-payment strongly influenced county governments' performance in Kenya. The study has limited application in Meru County given the differences in the level of adoption of electronic procurement across different counties. Besides the analysis of the study was based on descriptive analysis and focused on electronic procurement planning.

The studies highlighted have tended to be in other contexts with scanty studies in the context of Siaya County examining the nexus between procurement performance and e-procurement. Further, most studies sought to examine the effect of e-procurement on organizational performance with few studies focusing on procurement performance. As a result, this study aimed to bridge the information gap by assessing the effect of e-procurement on procurement performance in Siaya County.

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1.3 General Objective of the Study

The general objective of this study was to establish the effect of electronic procurement practices on procurement performance in Siaya County.

1.3.1 Specific Objectives

i. To establish the effect of electronic tendering on procurement performance in Siaya County.

ii. To analyze the effect of electronic sourcing on procurement performance in Siaya County.

iii. To evaluate the effect of electronic invoicing on procurement performance in Siaya County.

iv. To examine the effect of electronic payment on procurement performance in Siaya County.

1.4 Research Questions

The study was guided by the following research questions:

i. What is the effect of electronic tendering on procurement performance in Siaya County?

ii. How does electronic sourcing affect procurement performance in Siaya County?

iii. Does electronic invoicing affect procurement performance in Siaya County?

iv. What is the effect of electronic payment on procurement performance in Siaya County?

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1.5 Significance of the Study

The findings of the study would beneficial to the management in County Governments. Firstly, the outcomes of establishing the nature of the relationship that E-Procurement has on performance in the Counties in Kenya may in turn contribute to procurement planning policy-making by the management within County governments of Kenya. Secondly, the

management of the county governments of Kenya would benefit from the findings of this study by coming up with a working procurement system and process consistent with goals set for the counties.

The study will also be useful to scholars by filling a literature gap in understanding the link between procurement performance and e-procurement, especially in the devolved government system in Kenya. This investigation will expand the pool of literary knowledge concerning electronic procurement and procurement performance in countries in Kenya and highlight areas for further research.

The study would be critical to the regulator of procurement activities in Kenya. The Public Procurement Regulatory Authority (PPRA) would find the study insightful as regards the role of e-procurement in enhancing the effectiveness and efficiency of procurement activities in the country. The regulator can thus incentivize and sensitize public institutions and organizations to adopt electronic procurement aspects to enhance their conformance to the Public Procurement Act.

1.6 Scope of the study

The study was undertaken in Siaya County and focused on how e-procurement is impacting procurement performance within Siaya County. The study targeted 160 staff of Siaya County's procurement, Stores, finance, and audit departments as the respondents. E-procurement was the independent variable while procurement performance was the dependent variable of the study. The time scope of the study was one year from the beginning of 2023 to the end of 2023.. The study methodology

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Descriptive research design that sourced data based on structured questionnaires to examine the effect of e-procurement on procurement performance.

1.7 Limitations of the Study

The target of the study was the Siaya County and therefore the findings may not sufficiently represent all the other 46 counties in Kenya.

Some respondents were not willing to freely reveal all the desired information. The study overcame this challenge by seeking approval from the leadership in Siaya County and explaining the gains that would accrue from their total cooperation in the study. There was also the limitation of using a structured questionnaire given that it does not provide for opportunity for probing questions to generate additional information. The study reduced the negative impact of the structured questionnaire via the inclusion of adequate indicators and statements in the questionnaires to capture as much information as possible. Further, the sole use of primary data to capture electronic procurement and procurement performance posed the challenge of bias as it relied on self-evaluation by the respondents. The study reduced the negative impact of such biases by collecting data from both management and management staff who gave varied responses on different aspects of phenomena. Further, the questionnaires were pilot-tested to ensure they were valid and reliable and generated objective information needed to answer research questions.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents an overview of the extant literature in relation to the link between e-procurement and procurement performance. The empirical and theoretical literature that forms the foundation for the study is examined in this chapter. Further, a conceptual model and summary of the literature reviewed are presented.

2.2 Theoretical Framework

The study draws upon the Unified Theory of Acceptance and Use of Technology, Kurt Lewin's Three Step Change Theory, Dell's Electronic Procurement Theory and Resource-based view.

2.2.1 Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) is an extension of the TAM. The theory, proposed by Venkatesh et al. (2003), integrates elements from various theoretical models and extends TAM by incorporating additional constructs and moderators. The UTAUT integrates predictors of technology use such as performance expectancy, effort expectancy, social influence, and facilitating conditions (Davis et al. 1989). The first construct underlying UTAUT is the Performance Expectancy that describes the extent to which an individual believes that using a given digital tool will improve the performance of a given activity and meet a specific goal (Hanifi & Ali, 2017). If users of e-procurement in county governments expect it to perform in carrying out procurement functions, they are likely to adopt it faster than if it were otherwise.

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The second construct of UTAUT is effort expectancy which refers to the extent to which a user of new technology perceives that he or she will use the minimal effort possible in using the technology (Venkatesh et al., 2016). If users of electronic procurement expect that the effort needed to operate it is not so much such that it is easier to use as compared to alternative manual methods of procurement, they are likely to adopt it faster than if it requires a lot of effort in using.

The UTAUT is also based on the Social Influence construct that captures the extent to perspective users of new technologies are influenced by other important persons into using the technology (Chuttur, 2009). It reflects the influence of social norms, subjective norms, and social pressure on the intention of a user of technology to adopt it. The top leadership in county governments has put in place electronic procurement as the primary technology tool in the performance of procurement functions. Therefore, the procurement officers have no other option but to adopt and use electronic procurement. Another construct in UTAUT is the acilitating conditions that refers to the extent to which prospective user of new technology perceives that they are supported into using a new technology including training, technical support, and any other support needed.

The next construct of UTAUT is moderators such as age, gender, and experience. UTAUT incorporates these moderators that may influence the relationships between the core constructs and users' behavioural intentions to adopt and use technology. For instance, younger users often have better perceptions and motivations for adopting technology compared to older users (Benbasat & Barki, 2007). Therefore, UTAUT provides a more comprehensive understanding of technology acceptance behavior by integrating multiple determinants and moderators into a unified theoretical framework.

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However, the theory has its fair share of criticisms. While UTAUT aims to provide a comprehensive understanding of technology acceptance, some studies have found its predictive power limited especially in diverse cultural or organizational contexts. The model may not capture the full range of factors that influence technology adoption behaviour, leading to gaps between theoretical predictions and actual user behaviour (Yogesh et al., 2017).

Nevertheless, UTAUT provides valuable insights for designing and implementing technology initiatives to enhance user acceptance, adoption, and usage outcomes. The model informs electronic procurement as an explanatory variable in this study and how it affects procurement. Performance expectancy informs the use of electronic procurement due to its promised benefits such as timely transaction processing, shorter lead times, and cost efficiency while effort expectancy explains the success of the use of electronic procurement when the staff perceives it to be easy to use as compared to alternative manual method.

2.2.2 Kurt Lewin's Three-Step Change Theory

Kurt Lewin's Three-Step Change Theory was first developed by Lewin (1947) to describe three sequential stages that organizations typically go through when undergoing significant changes (Lewin, 1947). Kurt Lewin's Three Step Change Theory consists of the stages of unfreezing, moving, and refreezing. This model is crucial in understanding and implementing organizational change. The first stage, unfreezing, involves preparing the organization for change by overcoming resistance and existing mindsets. In the first stage, unfreezing, the organization prepares itself for change by overcoming resistance

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and creating a motivation or readiness for change among its members (Burnes & Cooke, 2017). This stage involves breaking down existing routines, attitudes, and behaviours that may hinder the adoption of new practices or processes. Unfreezing can be achieved through various means, such as communication, education, participation, or leadership support, to create a sense of urgency and awareness about the need for change (Palmer et al., 2017).

The second stage, the change itself, entails implementing the actual change. The stage is where the organization implements new practices, processes, structures, or technologies to achieve its desired objectives. This stage is characterized by uncertainty, resistance, and experimentation as individuals and groups adapt to new ways of working (Cummings et al., 2016). Effective communication, training, support, and leadership are essential during this stage to facilitate the transition and minimize disruptions. The third stage is the refreezing stage which focuses on stabilizing the new changes to make them permanent. Refreezing involves stabilizing the change by reinforcing the new behaviours, processes, or structures. This stage aims to institutionalize the change and ensure its sustainability over time. Refreezing may involve formalizing new policies and procedures, providing ongoing support and training, recognizing and rewarding desired behaviours, and reinforcing the change through leadership actions and organizational systems (Burnes & Cooke, 2017).

This theory emphasizes the importance of communication, trust, and openness to change in facilitating successful organizational transitions. Lewin's model provides a structured approach for organizations to navigate through change processes effectively. The Three-Step Change Theory emphasizes the importance of creating a supportive environment,

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involving stakeholders, and managing resistance throughout the change process. It recognizes that change is a dynamic and iterative process that requires careful planning, communication, and leadership to be successful. This theory underpins this study as the adoption of e-procurement in devolved government requires effective change management policy as the agencies move from the use of manual systems in procurement to the use of automated systems in procurement. As such necessary interventions have to be made to ensure the shift addresses all the concerns of the users of the procurement function within the government agencies.'

2.2.3 Resource Based View

The Resource-Based View (RBV) serves as a strategic management framework that underscores the significance of a firm's internal resources and capabilities in securing a sustainable competitive advantage. The major proponents of the theory include Penrose (1959), Barney (1991), and Wernerfelt (1984). The approach redirects attention from external market dynamics to the distinctive resources that a firm holds, which must be valuable, rare, inimitable, and non-substitutable (Paauwe, 2024). The theory categorizes resources into financial, physical, human, and organizational with each resource playing a role in establishing competitive advantage (Barney, 1991). The resources can be tangible (e.g., physical assets, financial capital) or intangible (e.g., intellectual property, brand reputation, organizational culture)

The view further holds that to help a firm develop sustainable advantage, these resources must be valuable, rare, inimitable, and non-substitutable (VRIN) to enable the firm to sustain a long-term competitive advantage. Valuable resources enable the firm to implement strategies that improve efficiency or effectiveness. Rare resources that are not

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widely possessed by competing firms. Inimitable resources are difficult or costly for other firms to duplicate. Non-substitutable resources do not have strategically equivalent substitutes (Barney, 1991). The theory explains that effective interaction and coordination of resources are vital for optimizing firm influence and performance (Taher, 2012). The theory has been actively adopted in explaining improving organizational efficiency and effectiveness based on the use of internal resources (Kosiol et al., 2023). Despite its advantages, some critiques emphasize the necessity for empirical validation across various contexts, particularly within public sectors, where its implementation has not been thoroughly examined (Kosiol et al., 2023).

The theory supports this study on the effect of electronic procurement on procurement performance. Electronic procurement is an intangible resource that can be exploited to attain a competitive advantage for the Siaya County Government. The resource can be harnessed towards improving competitive advantage and procurement performance. Electronic Procurement aspects such as electronic tendering, electronic sourcing, electronic invoicing and electronic payment are critical in enhancing the performance of the Siaya County government.

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2.3 Empirical Literature Review

This is a review that deals with research studies contingent on a particular area of a discipline to show where gaps exist and how they can be addressed. The empirical review was organized in terms of the study's independent variables including e-tendering, e-sourcing, invoicing, and e-payment.

2.3.1 Electronic Tendering and Procurement Performance

Electronic tendering refers to the process of conducting tendering activities online using electronic platforms and technologies. It involves the use of digital tools and systems to manage the various stages of the tendering process, from publishing tender notices and soliciting bids to evaluating proposals and awarding contracts (Nurdin & Pettalongi, 2022). E-tendering enables firms to invite bids for the supply of products and prospective suppliers to bid for the same via the internet technology. Maalim and Kisimbii (2019) publication on E-Procurement showed that e-tendering has made it possible for governments globally to save over USD. 6. Million by eliminating the cost incurred in printing documents and excess staff involved in procurement. Kandie and Wachiuri (2023) observed that e-tendering has made it possible for firms to lower costs and save time in purchasing goods and services.

Studies in the global and regional context on the nexus between electronic tendering and performance are inclined tended to non-devolved systems establishing a strong contribution of e-tendering to the effectiveness and efficiency of procurement function (Jose & Camilo, 2021; Candela & Ulises, 2022; Paterne & De Dieu, 2022). In Columbia, Jose and Camilo (2021) evaluated whether the performance of manufacturing firms was influenced by e-procurement. The study's explanatory variables included e-tendering, e-bidding, e-sourcing, and e-purchasing. The research targeted fifty firms with procurement managers and supervisors participating in data collection via questionnaires. The quantitative data sourced was processed based on regression with e-tendering, e-bidding, and e-purchasing having a direct effect on financial performance. The study by Jose and Camilo (2021) was done in Columbia with a different operational environment from

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Kenya. Besides, it was actualized in manufacturing firms that have different operating environments from developed systems like county government.

In Argentina, among large manufacturing firms, Candela and Ulises (2022) just like Jose and Camilo (2021) evaluated whether performance was influenced by e-procurement. The study targeted staff in procurement departments of selected firms with data being analysed based on OLS regression. The analysis showed that e-tendering, e-bidding, and E-purchasing had a direct and major effect on performance. The study was carried out in Argentina which has a different operating environment hence the need for another study in the Kenyan context such as County governments.

A study based on Hospitals in Rwanda investigated the impact of implementing e-procurement (Paterne & De Dieu, 2022). To achieve these objectives, a descriptive approach was adopted in which the sample was 24 respondents with data being sourced through the use of a questionnaire. The results of the study indicate that the implementation of e-procurement aspects such as e-tendering enhanced the effectiveness of the Hospitals. Paterne and De Dieu (2022) were based on descriptive analysis and hence could not establish the magnitude of the effect of e-procurement on performance.

Studies in the Kenyan context have sought to establish that the relationship between e-tendering and the performance of procurement function is direct and strong (Njeru & Muthini, 2023; Gichuhi & Waruguru, 2020; Kaaria & Mwangangi, 2017; Hajir, 2021). In a study based in the Meru County Government, Njeru and Muthini (2023) evaluated whether the performance of devolved systems was affected by e-procurement practices. The research that adopted descriptive design focused on 400 respondents of which 200

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were finally picked based on stratified random sampling to fill the questionnaire. The findings showed that e-tendering and e-payment strongly influenced the performance of the county government in Kenya. Njeru and Muthini (2023) have limited application in Meru County besides the analysis was based on descriptive statistics hence the need for another study in the context of the Siaya County government.

A descriptive study was undertaken on the Influence of E-Tendering Process on Procurement Performance in Geothermal Development Company in Nakuru, Kenya. In the study, Gichuhi and Waruguru (2020) focused on 170 staff from GDC Nakuru region with multi-stage sampling being used to select 97 study participants. The study sourced data based on questionnaires with regression analysis being key in results generation. The study noted that e-tendering had a weak enhancement procurement performance. The study focused on GDC and hence has limited application in other contexts like devolved governments in Kenya.

In another of commercial state corporations in Kenya, Ehsan and Amin (2021) evaluated how the performance of state firms was impacted by e-procurement. The descriptive research was based on a sample of forty staff selected based on stratified sampling. The study participants were involved in a questionnaire filled with regression showing that performance was affected by e-procurement in a major way. The study was limited to a few aspects of e-procurement hence the need for another study that exhaustively examines aspects of e-procurement left out in the study.

In another study among public institutions in Kenya, Kaaria and Mwangangi (2017) analyzed how SCM was influenced by IT. The study considered explanatory variables

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including e-tendering, Electronic Data Interchange (EDI), and Enterprise Resource Planning (ERP). The study adopted a mixed methodology target population being one hundred and fifty-nine staff attached to the Judiciary in Nairobi. The study relied on census sampling where the population was involved in questionnaire filling to source primary data that was eventually analyzed using OLS regression. The study findings showed that electronic tendering, EDI, and ERP had a direct influence on SCM. Kaaria and Mwangangi (2017) focused on the General adoption of IT and not e-procurement besides it was on general performance and therefore the need for another study focusing on procurement performance in county governments.

In a study of supermarkets in Nairobi County, Hajir (2021) evaluated whether operational performance was influenced by e-procurement practices. The research considered aspects of e-procurement such as e-tendering, e-payment, and e-sourcing. The study was grounded on quantitative approaches to research with the target population being 94 Retail Supermarkets. The study relied on interview schedules and questionnaires with data being sourced from the procurement managers of each supermarket. The study adopted regression and Spearman rank correlation for data analysis with findings showing that e-tendering, and e-sourcing among others directly affected operational performance. Hajir (2021) focused on supermarkets in Nairobi and a study in the context of county governments would expand the applicability of the study findings.

2.3.2 Electronic Sourcing and Procurement Performance

E-sourcing involves the utilization of internet-based tools and decision-making support systems to enhance communication between buyers and suppliers. The main objective is to identify, assess, choose, and potentially collaborate with existing and prospective

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suppliers, while also gathering information on their products and pricing (Greunen et al., 2019). E-sourcing leverages information and communication technology (ICT) to streamline the supplier selection process through features such as Self-service Supplier Portal modules, standardized supplier evaluation criteria, centralized access to supplier information, tailored vendor registration forms, and monitoring of supplier performance based on Key Performance Indicators (KPIs), fostering supplier diversity, and overseeing insurance certificates (Biraori, 2018).

Electronic sourcing is critical in the performance of procurement functions with empirical studies tending to establish a positive link between procurement performance and electronic sourcing. In Bangladesh, Blum et al. (2023) undertook a study titled, 'Introducing E-Procurement in Bangladesh: The Promise of Efficiency and Openness.' The study compared electronic procurement to manual paper-based systems in Bangladesh between 2011 and 2016. The study adopted a fixed effect regression model revealing that aspects of e-procurement such as e-sourcing and e-tendering resulted in improved access to bidding opportunities, increased economic growth, enhanced administrative efficiency, faster tender processing time, and increased government savings. Blum et al. (2023) as a macro study did not focus on individual economic units such as a devolved government system. Besides, it was undertaken in Bangladesh which is a different context from that of Kenya.

In public hospitals in Tanzania, Silvester (2020)
evaluated whether procurement performance at Muhimbili National Hospital (MNH) was affected by e-procurement. The study based on descriptive design focused on fifty

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participants from MNH who finally participated in filling out the questionnaire and participating in a structured interview. Correlation and OLS regression revealed that e-informing, e-sourcing, and procurement-integrated systems had a positive relationship with procurement performance. is the study was based in Tanzania with a different operating environment hence calling for another research on devolved government in the Kenyan context to establish whether findings hold locally.

Past studies in the Kenyan context, outside the devolved system of governance, have tended to relate e-sourcing to organizational performance with a strong link existing between performance and adoption of e-sourcing (Ochieng & Kamaara, 2023; Ntooki &Kyule, 2021; Kandie & Wachiuri, 2023). In a study of State-Owned Enterprises in Kenya, Ochieng and Kamaara (2023) examined the association between performance and e-procurement. The study relying on descriptive research design targeted 419 staff sourced from 5 State-owned corporations. Stratified random sampling aided in picking 55 respondents in the study who filled survey questionnaire. The study based on regression analysis revealed that e-sourcing enhanced procurement performance strongly. The study was however based on state-owned enterprises and the current study which is in the context of the county government of Siaya would expand the application of findings in other settings.

Further, the link between e-procurement and the performance of organizations was undertaken in the context of Kenya's Judiciary by Ntooki and Kyule (2021). The study specifically examined whether e-sourcing explained performance. The study relying on resourced-based view adopted a descriptive research design and targeted 215 staff with 141 respondents. Just like in the study by Ochieng and Kamaara (2023), the study

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observed that electronic sourcing strongly enhanced organizational performance at the judiciary. Ntooki and Kyule (2021) was a case of the Judiciary hence may not be wholesomely applied in other contexts thus the rationale for other studies in devolved systems such as the Siaya County Government.

A study was undertaken at the Food and Agriculture Authority in Kenya focusing on the link among e-sourcing, e-tendering, and performance (Kandie & Wachiuri, 2023). The cross-sectional study was a census of 160 employees with structured questionnaires being adopted to source data. The findings based on correlation were in agreement with Ntooki and Kyule (2021) and Ochieng and Kamaara (2023) revealing that e-sourcing was strongly correlated with the performance of the organization. Further, e-tendering also strongly explains performance. Kandie and Wachiuri (2023) was based on the Food and Agriculture Authority hence limited generalization in other contexts calling for another study in devolved systems in Kenya and Siaya county in particular.

Studies also exist in the devolved governments in Kenya with studies either being a case of a single county (Abdi & Barasa, 2023) or several counties (Chepng'etich et al., 2020; Kitewan & Machoka, 2021). In the examination of 47 devolved systems in Kenya, Chepng'etich et al. (2020) examined whether performance was influenced by strategic e-procurement practice. The survey targeted 47 county governments with the sample being ten counties consisting of employees in the finance and procurement functions.. Stratified sampling was adopted to select 186 staff who participated in filling out questionnaires. The multivariate regression results reveal that strategic e-procurement practices like e-sourcing among other e-procurement practices had a direct and major effect on the performance of the devolved system. Chepng'etich (2020) was based on the

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performance of the devolved system rather than procurement performance hence the need for another study focusing on procurement performance in Siaya County.

In a study titled 'Effect of e-procurement implementation on the performance of the devolved system of government in Kenya', Kitewan and Machoka (2021) undertook an empirical study based on institutional and agency theories as well as a descriptive research design focusing on four counties. The research, just like in Chepng'etich (2020), noted that e-tendering and e-sourcing enhanced the performance of the devolved system. Kitewan and Machoka (2021) was undertaken in 10 counties with the results having limited generalization on the specific counties therefore there is a need for another study in Siaya County that was not studied.

Kwale County has also been active in the implementation of electronic procurement prompting Abdi and Barasa (2023) to undertake a study on the contribution of electronic practices to procurement performance in Kwale County. The study relied on TAM and Innovation Diffusion Theory with an explanatory analysis design being adopted where the targeted respondents were 185. A stratified sampling was then adopted to pick 127 respondents to participate in the study via the filling of the questionnaires. The study noted that electronic tendering and electronic sourcing strongly enhanced the effectiveness and efficiency of procurement processes.

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2.3.3 Electronic Invoicing and Procurement Performance

This study sought to examine the e-invoicing as another important aspect of e-procurement. Koch (2019) explained that e-invoicing is an electronic delivery and presentation of invoices to customers when goods and services are offered on credit

terms. It involves system-generated bills and invoices being delivered to customers via e-mails and text messages and received by customers on their e-mails and mobile phones. E-invoicing has gained traction in various firms and organizations globally (Harianto et al., 2020). The advent of e-invoicing has made it possible for businesses to generate and send bills rather than continue using manual invoices (Harelimana, 2020). Further, Gasani (2018) observed that e-invoicing has enhanced VAT payments by business organizations to the tax collection agency.

An empirical study was undertaken on whether supply chain performance was affected by e-procurement among SMEs in Indonesia (Wijaya, 2022). The quantitative study was based on only a survey undertaken among 390 staff from SMEs with the study adopting Structural Equation Modeling (SEM) and Partial Least Squares (PLS). The study established that e-electronic procurement aspects including e-invoicing, e-purchasing, and e-informing strongly explained supply chain performance. The study was based on the PLS method that does not capture the combined effect of the explanatory variables on the outcome variable.

In Ghana, research was undertaken among commercial State-Owned Enterprises (SOEs) on how organizational performance was influenced by e-procurement (Oppong, 2020). The descriptive research was based on a sample of 40 respondents picked based on stratified sampling with questionnaires being used to source data. The study, via regression, noted that SOEs in Ghana are using e-procurement, however, some functions are still being undertaken manually such as tendering, calls for proposals, and shortlisting of suppliers. The results were in agreement with Wijaya (2022) revealing that e-

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procurement functions such as e-invoicing had contributed to improved accountability, cost reduction, and transparency. Oppong (2020) was undertaken in SEOs in Ghana whose context is different from that in Kenya hence another study ought to be undertaken in Kenya in the context of a devolved system of government.

In the Kenyan context, empirical studies exist in the private commercial sector (Mutunga, 2020), devolved governments (Rasugu, 2021; Barasa et al., 2017), and non-governmental organizations. Among SMEs operating in Nairobi County, Mutunga (2020) undertook a study on whether the performance of SMEs depends on e-procurement adoption. The study relied on Drucker entrepreneurship theory and descriptive research with the study targeting 3000 SMEs of which a sample of 97 was chosen based on stratified random. The owners participated in filling the survey questionnaires with data being analyzed on the regression model. The study observed that e-invoicing strongly enhanced the performance of SMEs. Mutunga (2020) was undertaken among SMEs in Nairobi hence has limited generalization among SMEs necessitating another study on devolved government systems in Kenya.

In a study based on Kisii County, an empirical study examined how e-procurement influences supply chain management performance (Rasugu, 2021). The descriptive study focused on 40 County Government staff who provided primary data by filling out questionnaires. The chi-square test was applied to examine the association between the explanatory and outcome variables with findings depicting that strongly positive association between supply chain management performance and e-procurement aspects including e-invoicing, e-tendering, and e-payment. The study relied on chi-square that

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can only establish the association between variables but cannot show the magnitude of the effect of e-procurement on procurement performance.

In a study of the performance of Bungoma County in Kenya, Barasa et al. (2017) examined whether organizational performance was affected by e-procurement. The case study targeted one hundred and fifty staff attached to the procurement department based on purposive sampling The study, just like in Rasugu (2021) established that E-invoicing, E-Auction, and E-Purchasing directly affected the County Government's performance. Barasa et al. (2017) was based in the Bungoma County context and focused on the performance of the devolved government due to the influence of e-procurement. Another study ought to be carried out in another county in Kenya such as Siaya County.

In another study in the context of non-government organizations in Kenya, Ndei (2021) examined whether e-procurement enhanced NGO performance. The descriptive study targeted one hundred and thirty-five procurement officers who were involved in filing questionnaires used to source data. Based on regression analysis, the study concluded that electronic procurement aspects such as e-invoicing directly impacted on performance of organizations. Ndei (2021) was commissioned in non-governmental organizations and another study among devolved government systems like Siaya County would improve the application of findings in other contexts.

2.3.4 Electronic Payment and Procurement Performance

The empirical literature has also identified e-payment as another critical aspect of e-procurement. The E-payments are available over the Internet via Point of Sale (PoS)

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machines, mobile money agents, etc. Ndunda et al. (2020) observed that e-payment is critical in achieving maximum revenue collection. The e-payment is critical in enabling firms to avoid embezzlement of funds or revenues earned by making it possible for firms to settle their bills remotely. Business customers can comfortably send money from where they are without having to travel to the business (Tenaw, 2019; Mathias, 2020). Further, Hidayanto and Sawitri (2019) revealed that transformations in computer networks had improved the adoption of e-payment in purchasing.

In Tanzania, Mathias (2020) evaluated whether the performance of public institutions was being explained by the adoption of electronic procurement. The research that relied on the Diffusion of Innovations Theory and descriptive research sourced primary data based on closed-ended questionnaires and interviews. The research observed that e-procurement aspects including e-payment, e-purchasing, and e-auction explained performance in terms of reducing supply loss, improving transparency, reducing errors, increase transaction speed among other benefits. The study was undertaken among public organizations in Tanzania that have a different context from that of Kenya. Besides, the study was based on descriptive and content analysis that could not determine the magnitude of the effect which is only possible via a regression analysis.

Further, another study focusing on Busia County evaluated whether e-procurement practices contributed to procurement efficiency (Anyonje & Malenya, 2020). The study sourced data from the staff of the county government based on structured questionnaires. The findings, based on regression analysis, noted that e-payment, and e-sourcing strongly and positively affected efficiency in the county government of Busia. Anyonje and Malenya (2020) was localized in Busia hence the limited application of findings in Busia

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informing another study in Siaya County. In a study based on the Meru County Government, Njeru and Muthini (2023) evaluated the link between the performance of county governments and e-procurement practices adoption. The research that adopted descriptive design focused on 400 respondents of which 200 were finally picked based on stratified random sampling to fill the questionnaire. The findings were in agreement with Anyonje and Malenya (2020), revealing that e-payment strongly influenced the performance of the county government in Kenya. Njeru and Muthini (2023) have limited application in Meru County besides the analysis was based on descriptive statistics hence the need for another study in the context of the Siaya County government.

In a study of CEOs in Kenya, Ochieng and Kamaara (2023) examined whether e-procurement use contributed to performance. The study relying on descriptive research design targeted 419 staff sourced from 5 State-owned corporations. Stratified random sampling aided in picking 55 respondents in the study who filled survey questionnaire. The study based on regression analysis revealed that e-payment enhanced procurement performance strongly. Ochieng and Kamaara (2023) was however based on state-owned enterprises and another study in the context of the county government of Siaya would expand the application of findings in other settings.

A study based on SOEs was undertaken at GDC by Gichuhi (2021) examining whether the adoption of e-payment influenced procurement activities. The research targeted 170 staff from procurement out of which ninety-seven were picked based on multi-stage sampling who ultimately filled out the questionnaires. The study findings based on univariate OLS regression, just like in Ochieng and Kamaara (2023), showed that procurement performance was explained by e-payment. Gichuhi (2021) focused on the

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performance of GDC hence the need for additional study focusing on procurement performance due to electronic payment among county governments in Kenya.

In a study of supermarkets in Nairobi, Kenya, Munubi et al. (2017) evaluated the nexus between organizational performance and e-procurement. The study targeted four major supermarkets with cluster sampling being adopted to select one hundred and twenty-four staff from a total employee size of six hundred and nineteen. OLS regression revealed that e-payment, e-sourcing, and e-achieving improved performance. Munubi et al. (2017) focused on organization performance in the context of supermarkets. Therefore, there was a need for a study to focus on the link between e-payment and procurement performance in Siaya County.

An impactful study focusing on sugar cane processing firms in Kenya was carried out on whether supply chain performance was affected by e-procurement (Sakwa & Ngeno, 2018). The study was based on mixed methodology with the target population being twelve firms of which three hundred and sixty-seven staff were selected from a total of 7,584 employees based on stratified random sampling. The findings showed that the e-order and supply chain performance we directed were related. Sakwa and Ngeno, (2018) was carried out in the sugarcane processing firms context and focused on supply chain performance. There was need to carry out on the performance of projects in the electrification sub-sector.

A study based in Uasin Gishu County, Kenya, Rusto and Kibet (2017) evaluated whether organizational performance was influenced by e-procurement practices. The conceptualization of e-procurement was based on e-payment, e-tendering, and e-

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invoicing. The research targeted five hospitals where a sample of three hundred and sixty-seven employees participated in the study by filling out questionnaires. The research revealed that e-payment, e-tendering, and e-invoicing directly impacted hospitals' performance.

2.4 Summary of Literature Reviewed

The reviewed literature has revealed that electronic procurement via its elements such as electronic tendering, electronic sourcing, electronic invoicing, and electronic payment has strongly explained procurement performance. Electronic tendering has made it possible for governments globally to eliminate the cost incurred in printing documents and excess staff involved in procurement. Kandie and Wachiuri (2023) also observed that e-tendering has made it possible for firms to lower costs and save time in purchasing goods and services. For instance, Jose and Camilo (2021), Candela and Ulises (2022), Gichuhi and Waruguru (2020) and Njeru and Muthini (2023) showed that e-tendering strongly explained organizational and procurement performance.

Further, electronic sourcing was established to be critical to enhancing procurement performance. Indeed, e-sourcing leverages ICT to streamline the supplier selection process enabling self-service supplier service, centralized access to supplier information, and monitoring of supplier performance (Biraori, 2018). Empirical studies by Blum et al. (2023), Silvester (2020), and Ochieng and Kamaara (2023) revealed that aspects of e-procurement such as e-sourcing enhanced procurement performance via improved access to bidding opportunities, increased economic growth, enhanced administrative efficiency, faster tender processing time and increased government savings. Electronic invoicing was also noted to be critically significant as far as procurement performance is concerned.

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Gasani (2018) observed that e-invoicing has enhanced Value Added Tax (VAT) payments by business organizations to the tax collection agency. Wijaya (2022), and Oppong, (2020) showed that e-procurement functions such as e-invoicing had contributed to improved accountability, cost reduction, and transparency.

The empirical studies also reveal that the nexus between electronic payment has tended to be strong and positive. Ndunda et al. (2020) observed that e-payment is critical in achieving maximum revenue collection. Further, e-payment is critical in enabling firms to avoid embezzlement of funds or revenues earned by making it possible for firms to settle their bills remotely. Business customers can comfortably send money from where they are without having to travel to the business (Tenaw, 2019). Mathias (2020) observed that e-procurement aspects including e-payment, e-purchasing, and e-auction explained performance in terms of reducing supply loss, improving transparency, reducing errors, increase transaction speed among other benefits. Additionally, Anyonje and Malenya (2020) noted that e-payment, and e-sourcing strongly and positively affected efficiency in the county government of Busia.

Even though a plethora of studies exist on the link between electronic procurement and performance a few knowledge gaps still exist. The studies highlighted have tended to be in other contexts with scanty studies on the nexus between procurement performance and e-procurement in the context of Siaya County. Further, most studies have tended to examine the effect of electronic procurement on organizational performance with few studies relating electronic procurement to procurement performance. As a result, this study aims to bridge the information gap by assessing the effect of e-procurement on procurement performance in Siaya County.

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Table 1: Summary of Knowledge Gaps

Source	Focus	Methodology	Results	Knowledge gaps
Candela and Ulises (2022)	Evaluated whether performance was influenced by e-procurement	The study targeted staff in procurement departments of selected firms with data being analysed based on OLS regression.	The analysis showed that e-tendering, e-bidding, and E-purchasing had a direct and major effect on performance	carried out in Argentina which has a different operating environment hence the need for another study in the Kenyan context such as County governments.
Paterne and De Dieu (2022)	A study based on Hospitals in Rwanda investigated the impact of implementing e-procurement	a descriptive approach was adopted in which the sample was 24 respondents with data being sourced through the use of a questionnaire.	The implementation of e-procurement aspects such as e-tendering enhanced the effectiveness of the Hospitals	The study was based on descriptive analysis and hence could not establish the magnitude of the effect of e-procurement on performance.
Njeru and Muthini (2023)	Evaluated whether the performance of devolved systems was affected by e-procurement practices.	The research that adopted descriptive design focused on 400 respondents of which 200 were finally picked based on stratified random sampling to fill the questionnaire.	E-tendering and e-payment strongly influenced the performance of the county government in Kenya.	Has limited application in Meru County besides the analysis was based on descriptive statistics hence the need for another study in the context of the Siaya County government.
Blum et al. (2023)	Introducing E-Procurement in	The study adopted a fixed-	aspects of e-procurement such	Macro study not focusing on

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	Bangladesh: The Promise of Efficiency and Openness.	effect regression model	as e-sourcing and e-tendering resulted in improved access to bidding opportunities, increased economic growth, enhanced administrative efficiency, faster tender processing time, and increased government savings.	individual economic units such as a devolved government system. Besides, it was undertaken in Bangladesh which is a different context from that of Kenya.
Silvester (2020)	Evaluated whether procurement performance at Muhimbili National Hospital (MNH) in Tanzania was affected by e-procurement	The study based on descriptive design focused on fifty participants from MNH who finally participated in filling out the questionnaire and participating in a structured interview. Correlation and OLS regression	informing, e-sourcing, and procurement-integrated systems had a positive relationship with procurement performance.	Based in Tanzania with a different operating environment hence calling for another research on devolved government in the Kenyan context to establish whether findings hold locally.
Ntooki and Kyule (2021).	the link between e-procurement and the performance of organizations was undertaken in the context of Kenya's Judiciary	The study relying on resourced-based view theory adopted a descriptive research design and targeted 215 staff with 141 respondents.	that electronic sourcing strongly enhanced organizational performance at the judiciary	a case of the Judiciary hence may not be wholesomely applied in other contexts such as devolved systems such as the Siaya County Government.
Wijaya (2022)	A study was undertaken on whether supply	The quantitative study was based on only a survey	E-electronic procurement aspects including	Based on the PLS method it does not

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	chain performance was affected by e-procurement among SMEs in Indonesia.	undertaken among 390 staff from SMEs with the study adopting SEM' and PLS.	e-invoicing, e-purchasing, and e-informing strongly explained supply chain performance.	capture the combined effect of the explanatory variables on the outcome variable.
Oppong (2020)	Research was undertaken among commercial State-Owned Enterprises (SOEs) on how organizational performance was influenced by e-procurement.	The descriptive research was based on a sample of 40 respondents picked based on stratified sampling with questionnaires being used to source data. The study, via regression.	SOEs in Ghana are using e-procurement, however, some functions are still being undertaken manually such as tendering, calls for proposals, and shortlisting of suppliers.	Undertaken in SEOs in Ghana whose context is different from that in Kenya hence another study ought to be undertaken in Kenya in the context of a devolved system of government. y
Mutunga, (2020)	on whether the performance of SMEs in Nairobi County depends on e-procurement adoption	The descriptive research targeted 3000 SMEs of which a sample of 97 was chosen based on stratified random. The owners participated in filling the survey questionnaires with data being analyzed on the regression model.	The study observed that e-invoicing strongly enhanced the performance of SMEs.	Undertaken among SMEs in Nairobi hence has limited generalization among SMEs necessitating another study among devolved government systems in Kenya.
Mathias (2020)	Evaluated whether the performance of public institutions in Tanzania was being explained	The research that relied on the Diffusion of Innovations Theory and descriptive research sourced	E-procurement aspects including e-payment, e-purchasing, and e-auction explained performance in	Undertaken among public organizations in Tanzania that have a different context from

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	by the adoption of electronic procurement	primary data based on closed-ended questionnaires and interviews.	terms of reducing supply loss, improving transparency, reducing errors, increase transaction speed among other benefits.	that of Kenya.
Anyonje and Malenya	A study focusing Busia County on evaluated whether e-procurement practices contributed to procurement efficiency	The study sourced data from the staff of the county government based on structured questionnaires. The findings, based on regression analysis,	The findings, based on regression analysis, noted that e-payment, and e-sourcing strongly and positively affected efficiency in the county government of Busia. A	The study was localized in Busia hence the limited application of findings in Busia informing another study in Siaya County.'

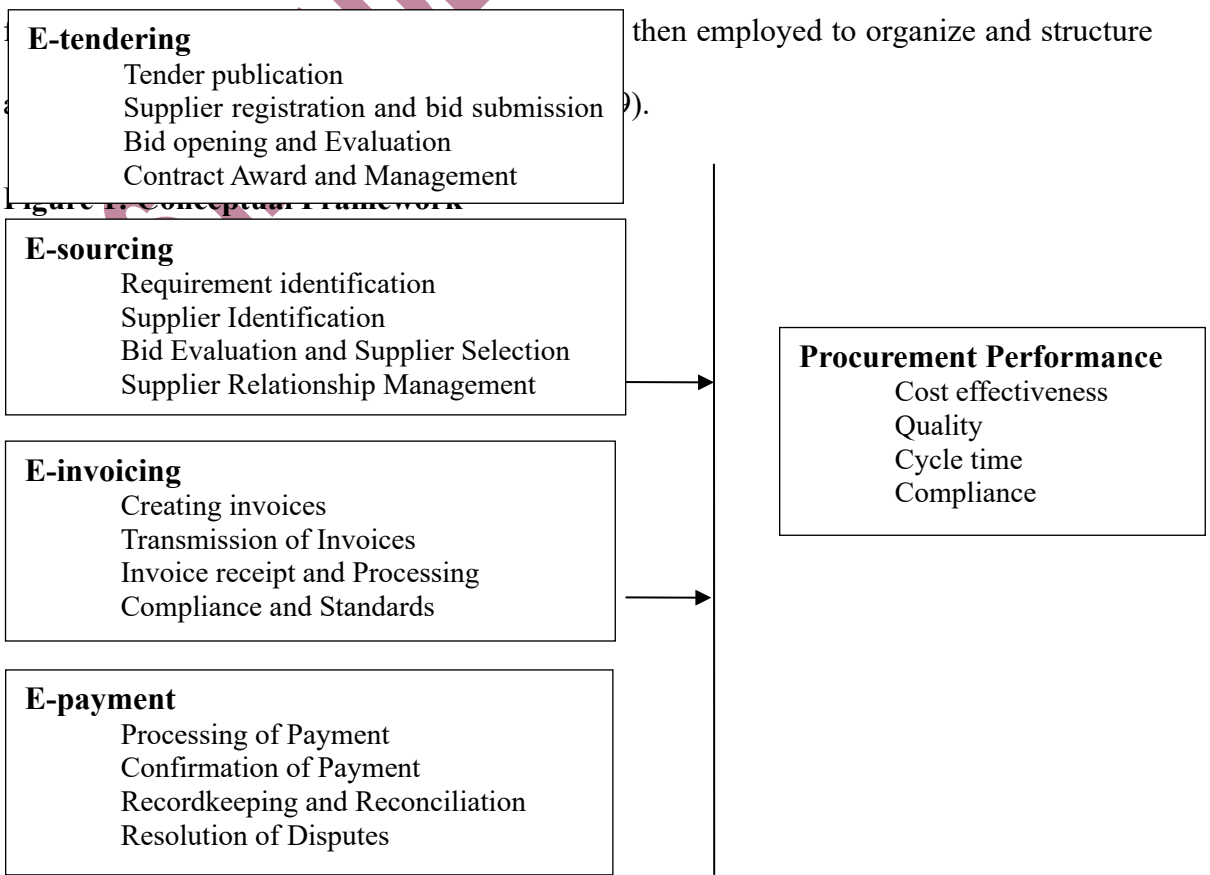
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2.5 Conceptual Framework

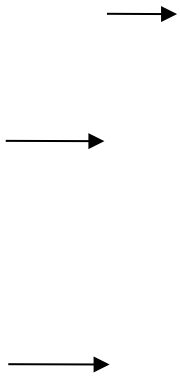
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then employed to organize and structure

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Source: Author (2024)

The independent variable in this study was e-procurement and it has been conceptualized into four aspects including e-tendering, e-sourcing, e-invoicing, and e-payment. The outcome variable is procurement performance. The research expected a positive effect of e-procurement on procurement performance (Figure 1).

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section presents the methodology that was utilized by the researcher to conduct the study. Research methodology provides a roadmap for organizing and executing research projects, ensuring rigor, reliability, and validity in the research process. It includes details on the research design, target population, and study area, sampling procedure, data collection, reliability and validity considerations, methods of data analysis, and presentation.

3.2 Research Design

The descriptive research design was adopted to examine the nexus between e-procurement and procurement performance in the context of the Siaya County government. A descriptive design enables the evaluation of the effect of explanatory variables on outcome variables when the researcher has no control over the natural setting where variables exist (Mugenda & Mugenda, 2009). The definition provided by Mugenda and Mugenda (2009) aligns with that of Olusola et al. (2013), who assert that a descriptive design refers to a research approach that involves gathering data through interviews or questionnaires from a selected group of individuals to address research inquiries related to the who, what, where, when, and how aspects of a problem.

3.3 Target Population

The study targeted 160 staff of the Siaya County Government (Siaya County Government, HR Records, 2024). As posited by Kothari (2004), the population is the totality of elements or objects or subjects that are the subject of a study to which a

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representative sample is selected from. Siaya County was the unit of analysis with a conclusion being made about its procurement performance. The staff of Siaya County Government were the unit of observation providing needed data as far as the adoption of electronic procurement by the county government as well as the procurement performance was concerned. The staff comprised management and non-management staff from different departments including Finance, Procurement, and Supply Chain Management as illustrated in Table 2.

Table 2: Target Population

Respondent Group	Target Population	Percentage (%)
Finance Officers	70	44
Procurement Officers	50	31
Supply Chain Officers	40	25
Total	160	100

Source: Siaya County HR Department (2024)

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3.4 Sampling Procedures and Techniques

The sample size is the number of elements, objects, or subjects picked from the population to represent it in a study when it is not possible or economic to study the whole population (Cooper & Schindler, 2003). The study was based on Yamane's (1967) formulae to calculate the sample size as follows:

The formula is $n = N / [1 + N(e^2)]$

Where n=Sample size

N=Population size

e=error term (0.05)

Hence, n=160/ [1 + 160(0.05*0.05)

N=114.2

The sample size of the study was 114 respondents. The study then adopted stratified sampling to select several elements in the sample to be picked from each stratum based on proportionate distribution. Stratified sampling involves segregating the target population into subgroups then elements from each subgroup are picked based on their proportionate number in the target population. The proportionate distribution is given in Table 3.

Table 3: Sampling Distribution

Target Group	Target Population	Percentage (%)	Sample Distribution
Finance Officers	70	44	50
Procurement Officers	50	31	35
Supply Chain Officers	40	25	29
Total	160	100	114

Source: Author (2024)

3.5 Data Collection Instrument

Data collection involves gathering unrefined data that can be converted into valuable insights through the systematic procedure of data analysis (Gall et al., 2007). The study sourced primary data based on a structured questionnaire. The questionnaires were constructed using a 5-point Likert scale to assess responses to items. The structured questionnaire was designed to elicit respondents' perceptions and opinions about the study's variables and indicators. The questionnaire was specifically intended to focus on topics that are relevant to the research objectives. The questionnaires were distributed electronically to respondents based on Google Forms in which a link was shared with selected respondents via their email addresses and included questions about the phenomenon under investigation. Questionnaires are a low-cost technique to collect

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information from respondents, and the acquired data can be saved for future use. The questionnaires were organized into three sections: Sections A, B, and C. Section A sourced general information about respondents and the county government. Section B sourced data on e-procurement aspects (e-tendering, e-sourcing, e-invoicing, and e-payment). Finally, section C sourced data on procurement performance.

3.5.1 Pilot Test

A pre-study is undertaken before the actual data collection based on study instruments. The goal of the pilot test is to fine-tune the data sourcing instruments such that study respondents can comprehend and answer the questions and that there are no problems recording the data. The pilot testing was undertaken among 12 staff from Kisumu County to enable the researcher to assess the validity and reliability of the questionnaire and the likely dependability of the data to be collected. The number slated for pilot study represents 10% of the sample size as suggested in Mugenda and Mugenda (2009).

3.5.2 Validity of Research Instrument.

The degree to which data collection instruments accurately assess the intended measurements is known as validity (Kothari, 2004). The study examined face validity, content validity and construct validity. Content validity was examined by getting the opinion of procurement experts. The researcher first distributed the questionnaire to experts in procurement including the supervisors for evaluation. Further, to examine face validity and construct validity, the instruments were filled during the pre-study to establish clarity and comprehensiveness from the point of view of respondents. The

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response from procurement experts and pre-study were utilized to improve the instruments as was also adopted by other researchers (Amuyunzu & Kisimbii, 2020).

3.5.3 Reliability of Research Instrument

The reliability of a data collection instrument refers to its ability to consistently measure the intended variables (Treiman, 2009). An assessment of reliability was conducted by employing the internal consistency measure, which is determined through the utilization of Cronbach's alpha (Anastasiadou, 2006). A Cronbach's alpha was generated using SPSS software. As supported by Betancourt et al. (2009), the study would conclude that instruments used in data collection are reliable when Cronbach's alpha is a least 0.70.

3.6 Data Analysis and Presentation

Before being coded and entered into Statistical Package for Social Scientists (SPSS) version 25, the completed questionnaires underwent a thorough check for completeness. The analysis employed both descriptive and inferential statistical tools. Descriptive analysis included standard deviation, mean, and percentages. The inferential analysis included Pearson correlation coefficient and regression analysis to identify the effect of e-procurement on procurement performance in Siaya County, Kenya. The findings were presented in form of Tables and accompanying explanations. The regression equations (3.1 - 3.4) below illustrate the empirical models that were employed in the study.

$PP = \beta_0 + \beta_1$ e-TENDER + ε……..……...……..[3.1]

$PP = \beta_0 + \beta_2$ e-SOURCE + ε……..[3.2]

$PP = \beta_0 + \beta_3$ e-INVOICE + ε……..[3.3]

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$PP = \beta_0 + \beta_4 e\text{-}PAY + \varepsilon$……..[3.4]

$PP = \beta_0 + \beta_5 e\text{-}Procurement + \varepsilon$……..[3.5]

Where: PP – Procurement Performance

β_0 = is y-intercept Term

$\beta_1, \beta_2, \beta_3, \beta_4 \beta_5$– beta coefficients of explanatory variables

e-Tender= e-Tendering

e-Source= e-Sourcing

e-Invoice=e-invoicing

e-Pay= e-Payment

e-Procurement = (e-Tendering + e-Sourcing+ e-Invoicing + e-Payment)

ε = Stochastic term capturing unobserved variables also affecting procurement performance

3.7 Ethical Consideration

To uphold ethical standards, the researcher obtained an introductory letter from the School of Business, and Leadership studies and a letter was also obtained from the National Commission of Science, Technology and Innovation (NACOSTI) to allow data collection. These letters were delivered to Siaya County offices and used as identification for scheduling appointments with branch managers. This study emphasized on ethical issues such as informed permission, confidentiality, privacy, and anonymity. Participants were fully informed and offered the option of participating or not. The information

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gathered was used solely for the intended purpose and kept confidential to safeguard the participants' privacy and anonymity.

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CHAPTER FOUR

ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents findings, data analysis, discussions, conclusion and recommendations. The overall aim of the study was to establish the relationship between electronic procurement and procurement performance in county government of Kenya with a focus on Siaya County. The unit of observation was drawn from procurement officers, supply chain and finance whose total was 114. Data was collected from the respondents using a structured questionnaire with items constructed on a Likert scale. Data was then subjected to descriptive and inferential statistical analysis to determine the characteristics that adequately described the variables. Frequency distribution, percentages, mean and standard deviation were applied as the most suited descriptive statistics while a multiple regression analysis was applied to determine the extent to which the independent variable predicted the dependent variable. Pearson's correlation coefficient was used to determine whether any linear relationship existed before data was subjected to statistical analysis.

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4.2 Response Rate

A total of 114 survey questionnaires were issued to the respondents in Siaya County with the aid of Google Forms. The links to the Google forms were shared with the respondents through their emails. Of the number that was issued, 96 questionnaires were adequately filled hence usable for data analysis. The response rate was therefore 84.2% hence adequate as suggested by Mugenda and Mugenda who held that a response rate of at least 70% in a survey study was adequate for further analysis. The high response rate was

achieved through making phone calls and emails to remind the respondents to fill out the questionnaire. Additionally, the use of Google Forms facilitated the process of data collection as it was convenient and the responses were received immediately after they were filled. The response rate is given in Table 4.

Table 4: Response Rate

Questionnaire	Count	Percentage (%)
Adequately filled	96	84.2
Non responses	18	15.8
Total	114	100.0

Source: Survey Data (2024)

4.3 Population Demographic

Demographic information was generated from the survey questionnaires to establish the distribution of the respondents in terms of variables such as gender, age, education and experience as presented in Table 5 - 8.

4.3.1 Gender

The distribution of respondents in terms of gender was examined in the study where the categories were male and female. The findings in Table 5 showed that male respondents were the slight majority in the study at 54 (56.3%) followed closely by female respondents at 42(43.8%). The findings therefore indicated that both genders were adequately represented in the study.

Table 5: Gender of the Respondents

Demographic Variable	Category	Frequency	Per cent
Gender	Female	42	43.8
	Male	54	56.3
	Total	**96**	**100.0**

Source: Survey Data (2024)

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4.3.2 Age

The distribution of respondents in terms of age was examined in the study. The respondents were categorized into five age groups including less than 25 years, 25-35 years, 36-40 Years, 41-50 years and above 50 years (Table 6)

Table 6: Age of Respondents

Demographic Variable	Category	Frequency	Per cent
Age	below 25 years	6	6.3
	25- 35 years	60	62.5
	36-40 years	12	12.5
	41- 50 years	12	12.5
	over 50 years	6	6.3
	Total	**96**	**100.0**

Source: Survey Data (2024)

The findings of the study (Table 6) showed that 60(62.5%) were aged 25 to 35 years, 12 (12.5%) were either aged 36 to 40 years or 41-50 years. Further, 6(6.3%) were either aged below 25 or over 50 years. Generally, the majority of respondents in the study were youthful.

4.3.3 Education

The distribution of the respondents in terms of the highest educational attainment was examined in the study. Education was categorized into certificate/diploma, bachelor degrees and post-graduate degrees (Table 7).

Table 7: Educational Level of Respondents

Demographic variable	Category	Frequency	Per cent
Valid	Certificate/Diploma	36	37.5
	Bachelors	36	37.5
	Postgraduate	24	25.0

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Total	**96**	**100.0**

Source: Survey Data (2024)

The findings in Table 6 showed that 36(37.5%) of the respondents either held a certificate/ diploma or Bachelor's degree. The remaining respondents held post-graduate degrees. The findings indicate that the respondents had adequate knowledge of the relationship between electronic procurement and procurement performance in the County Government of Siaya.

4.3.4 Experience

The final demographic variable examined was the experience of the respondents working in the Siaya County Government. The variable experience level was grouped into four categories including below 1 year, 1- 2 years, 3-5 years, 6-10 years and above 10 years (Table 8).

Table 8: Length of Time Working

Demographic Variable	Category	Frequency	Per cent
Experience	less than 1 year	24	25.0
	1-2 years	30	31.3
	3-5 years	24	25.0
	6-10 years	12	12.5
	over 10 years	6	6.3
	Total	**96**	**100.0**

Source: Survey Data (2024)

The results in Table 8 showed that 30(31.3%) had worked in Siaya County government for 1-2 years, and 24(25%) had worked in Siaya County government for either less than 1 year or 3-5 years. Further, 12(12.5%) had worked at the county government for between 6-10 years. Finally, 6(6.3%) had worked at the county government for over 10 years. The

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findings generally show that most of the respondents had worked in Siaya County Government for 1 year and above showing the limited nature of tenure in county governments that is informed by political change after 5 years thus most employees tend to work less than 5 years.

4.4 Reliability and Validity

The pilot testing was undertaken among 12 staff from Kisumu County to enable the study to assess the validity and reliability of the questionnaire and the likely dependability of the data to be collected. The reliability and validity of the data collection instrument were examined based on pilot testing results. Reliability was examined based on the internal consistency measure of Cronbach Alpha while the content and face validity were examined based on the opinion of the procurement experts and pre-study respondents' understanding of the questionnaire items.

4.4.1 Reliability Test

The reliability of the data collection instrument was conducted by employing the internal consistency measure, which is determined through the utilization of Cronbach's alpha (Anastasiadou, 2006). As supported by Betancourt et al. (2009), the study would conclude that instruments used in data collection are reliable when Cronbach's alpha is a least 0.70. The findings in Table 9 showed that the constructs were reliable given that all the Cronbach Alpha values were greater than 0.7.

Table 9: Cronbach Alpha

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Construct	Cronbach Alpha	Number of items	Conclusion
Electronic Tendering	.949	7	Reliable
Electronic Sourcing	.914	9	Reliable
Electronic Invoicing	.930	6	Reliable
Electronic Payment	.845	6	Reliable
Procurement Performance	.952	8	Reliable

Source: Survey Data (2024)

4.4.2 Validity Test

Further, the study examined face validity and content validity. Content validity was examined by getting the opinion of procurement experts. The researcher first distributed the questionnaire to experts in procurement including the supervisors for evaluation. Further, to examine face validity and content validity, the instruments were filled during the pre-study to establish clarity and comprehensiveness from the point of view of respondents. The response from procurement experts and pre-study were utilized to improve the instruments as was also adopted by other researchers (Amuyunzu & Kisimbii, 2020).

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4.5 Descriptive Analysis

The distribution of the study variables was examined based on descriptive statistics. The independent variables included electronic tendering, electronic sourcing, electronic invoicing, and electronic payment while the dependent variable was procurement performance.

4.5.1 Electronic Tendering

The distribution of responses on capturing electronic tendering as implemented in Siaya County government, Kenya, was examined. The respondents used a 5-point Likert scale

in rating the statements. The research adopted frequency distribution, percentages, mean and standard deviation in analysing the data sourced (Table 10).

Table 10: Electronic Tendering

Electronic Tendering Statements	Mean	Std. Dev
The management of ongoing tenders is done on the electronic platform	3.87	1.05
Suppliers register for published tenders online	3.85	1.11
Electronic Tendering allows online tender publication	3.84	1.32
Bid opening is done online	3.82	1.05
Suppliers make a bid for tenders on the electronic platform	3.81	1.07
The county evaluates bids online	3.66	1.32
The county communicates electronically on successful bids	3.56	1.33
Overall Mean Score	3.77	1.17

Source: Survey Data (2024)

Table 10 presents the findings on the distribution of statements on electronic tendering as practised in Siaya county governments based on mean and standard deviation. The mean response scores were arranged in descending order from the most practiced to the least practiced aspect of electronic tendering. The most implemented aspect of electronic tendering was that the management of ongoing tenders was done on the electronic platform. The statement was supported by a slight majority of respondents as evidenced by mean response score (M = 3.87) and standard deviation (SD =1.05) tending to agreement. The findings indicate that the Siaya County government was actively managing ongoing tenders using the electronic tendering capability. However, the mean score also implied that not all tenders were managed on the online tendering system implying that the manual system of tendering was not completely faced out. Nurdin and

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Pettalongi (2022) noted that e-tendering enables firms to invite bids for the supply of products and prospective suppliers to bid for the same via the internet technology.

The least implemented electronic tendering capability was that the county communicates electronically on successful bids. A slight majority of respondents supported the statement as evidenced by mean response score (M= 3.56) and standard deviation (SD=1.32) tending to agree implying that the respondents were generally indifferent as to whether the county government communicates on successful tender bids based on the electronic tendering system. The finding further showed that not all successful bids were communicated on the e-tendering system with some form of communication outside the system taking place. Further, the average mean score (M= 3.77) tended to agree indicating that generally, the county had an electronic tendering in place and was using it to manage tendering. The findings agree with Jose and Camilo (2021) that e-tendering directly explains financial performance.

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4.5.2 Electronic Sourcing

The distribution of responses on the statements capturing electronic sourcing as implemented in Siaya County government, Kenya was examined in the survey. The respondents used a 5-point Likert scale in rating the statements. The research adopted frequency distribution, percentages, mean and standard deviation in analysing the data sourced. Table 11 presents the findings on the distribution of statements on electronic sourcing as practised in Siaya county governments based on mean and standard deviation. The mean response scores were arranged in descending order from the most practised to the least practised aspect of electronic sourcing. The most implemented aspect of electronic sourcing was that the need and requirement identification was done

on the electronic platform. The majority of respondents supported the statement as evidenced by mean response score (M= 4.25) and standard deviation (SD=.83) tending to strong agreement. The findings imply that the County government of Siaya was actively identifying needs and making requisitions based on identified needs on the online sourcing platform. The findings show continued undertaking of need assessment and requirement identification on the electronic procurement platform. The use of electronic sourcing for organizational needs assessment can significantly enhance procurement processes and improve overall efficiency (Rahman, 2019).

Table 11: Electronic Sourcing

Electronic Sourcing Statements	Mean	Std. Dev.
The need and requirement identification are done on the electronic platform	4.25	.83
The county requests prospective suppliers to submit proposals on the online platform of the county.	3.93	1.09
The procurement department uses electronic means to manage long-term relationships with Suppliers	3.81	1.07
The county evaluates received bids using the electronic system	3.75	1.20
The county selects and informs successful bidders using the electronic platform	3.68	.92
The procurement department requests information from suppliers based on the electronic platform	3.68	1.10
The tender committee negotiation and Contract award are done via electronic means	3.68	1.26
The management of the contract performance is done via the online platform	3.56	1.22
The county procurement identifies prospective suppliers using electronic means	3.43	1.17
Overall Mean Score	3.75	1.09

Source: Survey Data (2024)

The least implemented aspect of electronic sourcing was that the county procurement identifies prospective suppliers using electronic means. A slight majority of respondents

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supported the statement as shown by the mean response score (M=3.43) and standard deviation (SD=1.17) tending to neutral. The findings on the statement indicate that the Respondents were generally indifferent to the statement. The finding therefore means that some product suppliers were identified on the electronic platform while other product suppliers were identified via alternative manual methods. E-sourcing leverages information and communication technology to streamline the supplier selection process through features such as Self-service, Supplier Portal modules, standardized supplier evaluation criteria, centralized access to supplier information, tailored vendor registration forms, and monitoring of supplier performance based on Key Performance Indicators (Biraori, 2018). The overall mean score (M=3.75) tended to agree indicating that generally, the Siaya County government had implemented and was using electronic sourcing capability to identify, attract and manage prospective suppliers.

4.5.3 Electronic Invoicing

The distribution of responses on the statements capturing electronic invoicing as implemented in Siaya County government, Kenya was examined in the study. The respondents used a 5-point Likert scale in rating the statements. The research adopted frequency distribution, percentages, mean and standard deviation in analyzing the data sourced. Table 12 presents the findings on the distribution of statements on electronic invoicing as practiced in Siaya county governments based on mean and standard deviation. The mean response scores were arranged in descending order from the most practiced to the least practiced aspect of electronic invoicing. The most implemented aspect of electronic invoicing was that the invoicing complies with procurement law and accounting standards as supported by the majority of respondents. This was evidenced by

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the mean response score (M= 4.06) and standard deviation (SD=. 1.14) tending to agreement. The findings thus show that the electronic invoicing in place had complied with the Public Procurement and Asset Disposal Act 2022. The findings imply the performance of procurement in terms.

Table 12: Electronic Invoicing

Electronic Invoicing Statements	Mean	Std. Dev.
The invoicing complies with procurement law and accounting standards	4.06	1.14
The invoices to be submitted to clients are created electronically	4.00	.94
Invoices received from suppliers are processed electronically via the online system	3.93	1.03
A copy of sent and received invoices is stored and backed up electronically	3.87	.93
Created invoices are transmitted electronically to clients	3.75	1.03
The county finance department receives invoices from suppliers on the electronic system	3.62	1.27
Overall Mean Score	3.87	1.05

Source: Survey Data (2024)

The least practised and implemented aspect of electronic invoicing was that the county finance department receives invoices from suppliers on the electronic system. This was shown by a slight majority of respondents supporting the statement as evidenced by the mean response (M=3.62) and standard deviation (SD = 1.27) tending to agreement. The findings indicate that most of the time the county receives invoices from suppliers on the electronic system but there are instances when the invoices are received via the alternative manual method. The results were in agreement with Wijaya (2022) indicating that e-procurement functions such as e-invoicing had contributed to improved accountability, cost reduction, and transparency. The overall mean (M= 3.87) tended to

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agree showing that generally, the county government of Siaya was actively using electronic to generate and send invoices as well as receive the same from its current suppliers.

4.5.4 Electronic Payment

The distribution of responses on the statements capturing electronic payment as implemented in Siaya County government, Kenya was examined in the survey. The respondents used a 5-point Likert scale in rating the statements. The research adopted frequency distribution, percentages, mean and standard deviation in analysing the data sourced (Table 13).

Table 13: Electronic Payment

Electronic Payment Statements	Mean	Std. Dev.
Payment for supplies is initiated on the online platform	4.12	1.17
The payment of suppliers is done via electronic means such as mobile money and bank transfer	4.12	1.01
Record keeping for payments made and received is done on the online platform	4.10	.78
Reconciliation of payments and receipts is done on the online platform	3.87	.69
The county receives online receipts for payments made to suppliers	3.81	.81
The county receives payment via electronic means for services offered to the public	3.75	1.30
Overall Mean	3.96	0.96

Source: Survey Data (2024)

Table 13 presents the findings on the distribution of statements on electronic payment as practised in Siaya county governments based on mean and standard deviation. The mean response scores were arranged in descending order from the most practiced to the least practiced aspect of electronic payment. The most implemented aspect of electronic payment was that payment for supplies is initiated on the online platform. The statement

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was supported by the majority of respondents as evidenced by the mean score (M=4.12) and Standard deviation (SD = 1.17) tending to agreement. The findings show that the county government of Siaya was using electronic procurement actively in initiating payment processes. Ndunda et al. (2020) observed that e-payment is critical in achieving maximum revenue collection. The e-payment is critical in enabling firms to avoid embezzlement of funds or revenues earned by making it possible for firms to settle their bills remotely.

The least implemented aspect of electronic payment was that the county receives payment via electronic means for services offered to the public. A slight majority of the respondents agreed with the statement as evidenced by the mean response score (M= 3.75) and standard deviation (SD= 1.30) tending to agreement. The finding based on the statement indicates that the Siaya County government tended to receive payment for services offered to the public via electronic means even though a few payments were received in the form of cash. The findings show that streamlining the electronic payment platform to ensure all cash receipts are done electronically to curb leakages in funds collection. Business customers can comfortably send money from where they are without having to travel to the business (Tenaw, 2019; Mathias, 2020). The overall mean (M=3.96) tended to agree implying that the Siaya County government had implemented an electronic payment platform for making payments to suppliers as well as receiving payment from the general public for services offered.

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4.5.5 Procurement Performance

The distribution of responses on the statements capturing the procurement performance of Siaya County government, Kenya was examined in the survey. The respondents used a 5-point Likert scale in rating the statements. The research adopted frequency distribution, Percentages, mean and standard deviation in analysing the data sourced. Table 14 presents the findings on the distribution of statements on the procurement performance of Siaya county governments based on mean and standard deviation. The mean response scores were arranged in descending order from the most performed aspect of procurement to the least performed aspect of procurement.

Table 14: Procurement Performance

Procurement Performance	Mean	Std. Dev.
The procurement lead time has improved over the past year due to process optimization efforts.	4.00	1.00
The county procurement department has achieved cost efficiency in its functions.	3.81	1.19
The procurement processes are done according to existing procure laws.	3.75	1.25
Procurement specifications align with the actual needs and requirements of end-users or stakeholders.	3.75	.97
Inventory levels are monitored and adjusted on the online platform hence optimal quantities are maintained.	3.75	1.07
The inside users and the public are satisfied with goods and services procured by the county government.	3.68	1.16
The procurement process in our organization consistently delivers goods and services of high quality.	3.62	1.11
The county's procurement department is transparent and accountable to the electorates	3.56	1.22
Overall Mean	3.74	1.12

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Source: Survey Data (2024)

The most performed aspect of procurement was that the procurement lead time has improved over the past year due to process optimization efforts. The statement was supported by the majority of respondents as given by mean response (M = 4.00) and standard deviation (SD =1.00) tending to agreement. The finding based on the statement shows that the Siaya County government had reduced the time between making an order and the time it received supplies.

The least performed aspect of procurement was that the county's procurement department is transparent and accountable to the electorates. The statement was supported by a slight majority of the respondents as shown by the mean response score (M =3.56) and standard deviation (SD = 1.22) tending to agreement. The finding based on the statement indicate that even though the procurement department was generally transparent and accountable, there were instances when accountability was low. The overall mean score (M= 3.74) tended to agree hence it was evident that a slight majority of respondents were of the opinion that the procurement function in Siaya County government had slightly performed better. However, there were aspects of the procurement performance that needed to be improved.

4.6 Correlation Analysis

The association between electronic procurement and procurement performance was determined by the use of Pearson's correlation coefficient. The study adopted a bivariate Pearson correlation to examine the relationship between electronic procurement aspects and procurement performance as presented in Table 14. The value of the correlation coefficient is often between 0 and 1 where 0 implies no correlation and 1 implies perfect

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correlation. A correlation coefficient between 0.1 and 0.3 implies a weak correlation. A correlation coefficient between 0.4 and 0.6 implies a moderate correlation. A correlation coefficient between 0.7 and 0.8 implies a strong correlation. Further, the correlation coefficient can be negative or positive where the negative correlation coefficient implies that when the independent variable increases, the dependent variable decreases. A positive correlation coefficient implies that when the independent variable increases, the dependent variable also increases.

Table 15: Bivariate Pearson Correlation

		E-Tender	E-Source	E-Invoice	E-Pay	Pp
E-Tender	Pearson Correlation	1	.787**	.479**	.637**	.665**
	Sig. (2-tailed)		.000	.000	.000	.000
	N		96	96	96	96
E-Source	Pearson Correlation		1	.363**	.687**	.802**
	Sig. (2-tailed)			.000	.000	.000
	N			96	96	96
E-Invoice	Pearson Correlation			1	.730**	.403**
	Sig. (2-tailed)				.000	.000
	N				96	96
E-Pay	Pearson Correlation				1	.867**
	Sig. (2-tailed)					.000
	N					96
Pp	Pearson Correlation					1
	Sig. (2-tailed)					
	N					

**. Correlation is significant at the 0.01 level (2-tailed).
e-TENDER= Electronic tendering, e-SOURCE = Electronic sourcing, e-INVOICE = electronic invoicing, e-PAY=Electronic payment, PP = Procurement Performance

Source: Survey Data (2024)

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The findings presented in Table 14 showed that there was a linear moderate and positive relationship between electronic tendering and procurement performance (r =.665). The direct association indicate that when tendering process elements were continuously undertaken on the online platform, procurement performance was enhanced significantly in terms of aspects such as the procurement lead time and cost efficiency. The findings agree with Maalim and Kisimbii (2019) who established e-tendering has made it possible for governments globally to eliminate the cost incurred in printing documents and excess staff involved in procurement. Further, Kandie and Wachiuri (2023) observed that e-tendering has made it possible for firms to lower costs and save time in purchasing goods and services. There was a linear and strong positive relationship between electronic sourcing and procurement performance (r=.802). The finding means that improving e-sourcing in terms of its aspects such as need and requirement identification, online submission of proposals and managing long-term relationships with suppliers resulted in enhanced procurement performance.

Blum et al. (2023) noted that e-sourcing resulted in improved access to bidding opportunities, increased economic growth, enhanced administrative efficiency, faster tender processing time, and increased government savings. Further, electronic invoicing and procurement performance were linearly moderately and positively related (r= .403). The findings showed that enhancing electronic invoicing aspects such as electronic invoice creation and submission, electronic receipt of invoices and electronic backing up of invoices was associated with improved procurement performance. Mutunga, (2020) observed that e-invoicing strongly enhanced the performance of SMEs. Further, Ndei (2021) concluded that electronic procurement aspects such as e-invoicing directly

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impacted on performance of organizations. Finally, the relationship between electronic payment and procurement performance was linear strong and positive (r= .867). The finding show that undertaking payment based on the electronic payment system resulted in improved performance of the Siaya County government. Ndunda et al. (2020) observed that e-payment is critical in achieving maximum revenue collection. The e-payment is critical in enabling firms to avoid embezzlement of funds or revenues earned by making it possible for firms to settle their bills remotely. Mathias (2020) observed that e-procurement aspects such as e-payment explained performance in terms of reducing supply loss, improving transparency, reducing errors, increase transaction speed among other benefits.

4.7 Electronic Procurement on Procurement Performance

Regression analysis was adopted to examine the effect of electronic procurement on procurement performance. Ordinary least squares (OLS) univariate regression was adopted to examine the effect of each electronic procurement aspect on the procurement performance of the Siaya county government. Further, multivariate regression analysis was employed to examine the overall effect of electronic procurement on procurement performance in the Siaya County government.

4.7.1 Electronic Tendering on Procurement Performance

Ordinary least squares univariate regression was adopted to examine the effect of electronic tendering on the procurement performance of the Siaya county government. The regression output included the model summary, Analysis of variances (ANOVA) and regression coefficients. The model summary (Table 16) showed that the association

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between electronic tendering and procurement performance was positive and moderate (R= .665). Thus, an increased adoption of electronic tendering aspects was accompanied by enhanced procurement performance. Further, electronic tendering explained 44.3% of the variation in procurement performance with the residual variation of 55.7% in procurement performance being captured as unobserved variables that were not within the scope of the model. The analysis of variances indicated that the model was fit in the analysis of the relationship between electronic tendering and the procurement performance of Siaya County government (F-statistic =75.675, p-value = .000). Further, the regression coefficients showed that electronic tendering had a significant and positive effect on procurement performance as given by p-value lower than 5% level of significance (β_1= .617, t= 8.641 and p=0.000). The finding indicates that an increase adoption and use of electronic tendering by one unit resulted in a 0.617 unit increase in procurement performance in the Siaya County government.

Table 16: Effect of Electronic Tendering on Procurement Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.665[a]	.443	.437	.72624	2.177

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	39.385	1	39.385	74.675	.000[b]
	Residual	49.578	94	.527		
	Total	88.963	95			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	1.411	.280		5.041	.000

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e-TENDER	.617	.071	.665	8.641	.000

a. Dependent Variable: PP=Procurement Performance
b. Predictors: (Constant), e-TENDER = Electronic Tendering

Source: Survey Data (2024)

The intercept term (β_0= 1.411) showed that when e-tendering is held constant at zero, procurement performance was 1.411. The model was thus estimated as:

PP = 1.411+ .617 e-TENDER……..……..…… (3.1)

The positive and moderate effect of electronic tendering on procurement performance in Siaya County is attributed to the capabilities of electronic tendering that result in enhanced procurement performance. Electronic tendering aspects such as managing of ongoing tenders, registration for supplies, tender publication and bid opening eliminate costs associated with paper tendering and improve tender performance hence procurement performance.

The study findings as regards the effect of electronic tendering on procurement performance were in agreement with Jose and Camilo (2021) who established that e-tendering, e-bidding, and e-purchasing have a direct effect on financial performance. Candela and Ulises (2022) showed that e-tendering, e-bidding, and E-purchasing had a direct and major effect on performance. Paterne and De Dieu (2022) indicated that the implementation of e-procurement aspects such as e-tendering enhanced the effectiveness of the Hospitals. Njeru and Muthini (2023) showed that e-tendering strongly influenced the performance of Meru County. However, Gichuhi and Waruguru (2020) noted that e-tendering had a weak enhancement procurement performance. Further, Kaaria and Mwangangi (2017) found that electronic tendering, EDI, and ERP had a direct influence

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on SCM. Finally, Hajir (2021) found that e-tendering among others directly affected operational performance.

4.7.2 Electronic Sourcing on Procurement Performance

Ordinary least squares univariate regression to examine the effect of electronic sourcing on the procurement performance of Siaya county government. The model summary (Table 17) showed that electronic sourcing was positively and strongly correlated with procurement performance (R= .802). Therefore, improved adoption of electronic sourcing was accompanied by enhanced procurement in the Siaya County Government. Additionally, electronic sourcing explained 64.3% of the variation in procurement performance with the residual variation of 35.7% in procurement performance being captured unobserved variables that were not within the scope of the model. The analysis of variances indicated that the model was fit in the analysis of the relationship between electronic sourcing and procurement performance of the Siaya County government (F-statistic =169.197, p-value = .000).

Table 17: Effect Electronic Sourcing on Procurement Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.802[a]	.643	.639	.58139	1.455

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	57.190	1	57.190	169.197	.000[b]
	Residual	31.773	94	.338		
	Total	88.963	95			

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.	Beta		

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			Error			
1	(Constant)	.331	.269		1.231	.222
	e-SOURCE	.908	.070	.802	13.008	.000

a. Dependent Variable: PP=Procurement performance
b. Predictors: (Constant), e-SOURCE = Electronic Sourcing

Source: Survey Data (2024)

Further, the regression coefficients showed that electronic sourcing had a significant and positive effect on procurement performance as given by a p-value lower than a 5% level of significance (β_2= 0.908, t= 13.008 and p=0.000). The finding shows that an increase adoption and use of electronic sourcing by one unit resulted in a 0.908 unit increase in procurement performance in the Siaya County government. The intercept term (β_0= .331) showed that when e-sourcing is held constant at zero, procurement performance was .331. The model was thus estimated as:

PP = 0.331+ .908 e-SOURCE…….……..……...…… (3.2)

Electronic sourcing had the second highest positive effect on procurement performance in the Siaya county government after electronic payment. The finding indicate that an increase in the adoption and use of electronic sourcing resulted in improved procurement performance. Enhancing the adoption of electronic sourcing aspects such as need and requirement identification, online submission of proposals by prospective and online bids receipt and evaluation were associated with reduced lead time, enhanced cost efficiency and alignment of specifications with the actual needs and requirements of end-users or stakeholders.

The findings on the effect of electronic sourcing on procurement performance were in agreement with Blum et al. (2023) who found that aspects of e-procurement such as e-

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sourcing resulted in improved access to bidding opportunities, increased economic growth, enhanced administrative efficiency, faster tender processing time, and increased government savings. Silvester (2020) found that e-sourcing and procurement-integrated systems had a positive relationship with procurement performance. Ochieng and Kamaara (2023) indicated that e-sourcing enhanced procurement performance strongly. Ntooki and Kyule (2021) observed that electronic sourcing strongly enhanced organizational performance at the judiciary. Kandie and Wachiuri (2023) showed that e-sourcing was strongly correlated with the performance of the organization.

4.7.3 Electronic Invoicing on Procurement Performance

The model summary (Table 18) showed that electronic invoicing was positively and weakly associated with procurement performance (R= .403). Additionally, electronic invoicing explained 16.2% of the variation in procurement performance with the residual variation of 83.8% in procurement performance being captured unobserved variables that were not within the scope of the model.

Table 18: Effect of Electronic Invoicing on Procurement Performance

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Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		Durbin-Watson
1	.403[a]	.162	.153	.89035		1.924

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.446	1	14.446	18.224	.000[b]
	Residual	74.516	94	.793		
	Total	88.963	95			

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.097	.396		5.297	.000
	e-INVOICE	.425	.099	.403	4.269	.000

a. Dependent Variable: PP= Procurement Performance
b. Predictors: (Constant), e-INVOICE= Electronic invoicing
Source: Survey Data (2024)

The analysis of variances show that the model was fit in the analysis of the relationship between electronic invoicing and procurement performance of the Siaya County government (F-statistic =18.224, p-value = .000). Further, the regression coefficients showed that electronic invoicing had a significant and positive effect on procurement performance as given by a p-value lower than a 5% level of significance (β_3= .425, t= 4.269 and p=0.000). The finding indicates that an increase adoption and use of electronic invoicing by one unit resulted in a 0.425-unit increase in procurement performance in the Siaya County government. The intercept term (β_0= 2.097) showed that when e-invoicing is held constant at zero, procurement performance was 2.097. The model was thus estimated as:

PP = 2.097+ .425 e-INVOICE……..……..……..……..…… (3.3)

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The findings showed that electronic invoicing had the lowest effect on procurement performance. The findings therefore indicate that electronic invoicing did not contribute much to procurement performance as compared to other aspects of electronic procurement such as electronic payment and electronic sourcing. The comparatively low effect of electronic invoicing on procurement performance in Siaya County is attributed to the low adoption of preparation of electronic invoicing and the continued creation of manual invoices. The findings on the effect of electronic invoicing on procurement performance in Siaya County government are in congruence with Wijaya (2022) that established that e-electronic procurement aspects including e-invoicing, e-purchasing, and e-informing strongly explained supply chain performance.

Further, Oppong (2020) noted that SOEs in Ghana are using e-procurement. Further, Mutunga (2020) observed that e-invoicing strongly enhanced the performance of SMEs. Rasugu (2021) findings depicted a strong positive association between supply chain management performance and e-procurement aspects including e-invoicing. Barasa et al. (2017) just like Rasugu (2021) established that E-invoicing, E-Auction, and E-Purchasing directly affected the County Government's performance. Finally, Ndei (2021) concluded that electronic procurement aspects such as e-invoicing directly impacted on performance of organizations.

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4.7.4 Electronic Payment on Procurement Performance

The model summary (Table 19) showed that electronic payment had a strong and positive linear association with procurement performance (R= .867). Moreover, electronic payment explained 75.1% of the variation in procurement performance with the residual variation of 24.9% in procurement performance being captured unobserved variables that

were not within the scope of the model. The analysis of variances showed that the model was fit in the analysis of the relationship between electronic payment and procurement performance of the Siaya County government (F-statistic =283.86, p-value = .000).

Table 19: Effect of Electronic Payment on Procurement Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.867[a]	.751	.749	.48522	2.158

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	66.832	1	66.832	283.867	.000[b]
	Residual	22.131	94	.235		
	Total	88.963	95			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.617	.263		-2.341	.021
	e-PAY	1.098	.065	.867	16.848	.000

a. Dependent Variable: PP= Procurement performance
b. Predictors: (Constant), e-PAY= Electronic Payment

Source: Survey Data (2024)

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Further, the regression coefficients showed that electronic payment had a significant and positive effect on procurement performance as given by a p-value lower than a 5% level of significance (β_4= 1.098, t= 16.848 and p=0.000). The finding implies that an increase adoption and use of electronic payment by one unit resulted in a 1.098 unit increase in procurement performance in the Siaya County government. The intercept term (β0= -

.617) showed that when e-payment is held constant at zero, procurement performance was - .617. The model was thus estimated as:

PP= -.617 +1.098 e-PAY……..……(3.4)

The results Showed that electronic payment had the strongest positive effect on procurement performance among all the elements of electronic procurement considered in the study. The strong effect is attributed to the role of electronic payment in curbing leakages of revenues collected, timely payment of supplies and thus supplier satisfaction and reduction of funds embezzlement. Such benefits of electronic payment result in enhanced procurement performance of Siaya County government in terms of its aspects such as the delivery of goods and services of high quality and transparent and accountable procurement to the electorates.

The findings on the effect of electronic payment on procurement performance in the Siaya County government were in agreement with Ndunda et al. (2020) who observed that e-payment is critical in achieving maximum revenue collection. Mathias (2020) observed that e-procurement aspects including e-payment, e-purchasing, and e-auction explained performance in terms of reducing supply loss, improving transparency, reducing errors, increase transaction speed among other benefits. Further, Anyonje and Malenya (2020) noted that e-payment positively affected efficiency in the county government of Busia. Finally, Njeru and Muthini (2023) findings were in agreement with Anyonje and Malenya (2020), revealing that e-payment strongly influenced the performance of the county government in Kenya.

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4.7.5 Electronic Procurement on Procurement Performance

Composite univariate regression analysis was adopted to examine the combined effect of electronic procurement on the procurement performance of the Siaya County government. The model summary (Table 20) showed that electronic procurement explained 74.6% of the variation in procurement performance with the residual variation of 25.4% in procurement performance being captured by unobserved variables that were not within the scope of the model.

Table 20: Effect of Electronic Procurement on Procurement Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863[a]	.746	.743	.49074

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.326	1	66.326	275.412	.000[b]
	Residual	22.637	94	.241		
	Total	88.963	95			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.513	.261		-1.963	.053
	e-procurement	1.106	.067	.863	16.596	.000

a. Dependent Variable: PP
b.Predictors: (Constant), E-Procurement = (e-Tender+e-Source+e-Invoice+e-Pay)

Source: Survey Data

The analysis of variances indicated that the model was fit for examining the relationship between electronic procurement and the procurement performance of the Siaya County

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government (F-statistic =275.412, p-value = .000). Further, the regression coefficients showed that electronic procurement had significantly and positively affected procurement performance as given by a p-value lower than a 5% level of significance (β_5= 1.106, t= 16.596 and p=0.000). The finding means that increased adoption of electronic procurement capabilities by one unit resulted in enhanced procurement performance by 1.106 units. The intercept term (β_0= -.513) showed that when electronic procurement is held constant at zero, procurement performance was - .513. The model was thus estimated as:

PP= -.513 + 1.106 e-Procurement……..……....(3.5)

The findings are in congruence with Paterne and De Dieu (2022) who indicated that the implementation of e-procurement aspects such as e-tendering has an enhancing effect on the effectiveness of Rwandan Hospitals. Further, Chepng'etich et al. (2020) showed that e-sourcing enhanced the performance of the devolved system. Njeru and Muthini's (2023) findings showed that e-tendering and e-payment strongly influenced county governments' performance in Kenya. Further, Hajir (2021) noted that e-procurement aspects such as e-tendering, e-payment, and e-sourcing directly affected operational performance.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study examined the effect of electronic procurement on the procurement performance of the Siaya County government. The specific objectives included assessing the effect of electronic tendering on procurement performance in Siaya County; determining the effect of electronic sourcing on procurement performance in Siaya County; evaluating the effect of electronic invoicing on procurement performance in Siaya County; and examining the effect of electronic payment on procurement performance in Siaya County. The chapter therefore presents the discussion, conclusion, recommendations and areas for further research.

5.2 Summary of Key Findings

The first objective sought to assess the effect of electronic tendering on procurement performance in Siaya County. The findings based on correlation analysis showed that electronic tendering and procurement performance were moderately and positively

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correlated. Further, the regression analysis showed that electronic tendering had a strong and positive effect on procurement performance in the Siaya County Government.

The second objective sought to determine the effect of electronic sourcing on procurement performance in Siaya County. The study, based on correlation analysis, showed that electronic sourcing and procurement performance were positive and strongly correlated. Further, the regression analysis indicated that electronic sourcing significantly explained procurement performance in the Siaya County Government.

The third objective sought to evaluate the effect of electronic invoicing on procurement performance in Siaya County. The findings based on correlation analysis showed that electronic invoicing and procurement performance were moderately and positively correlated. Further, the regression analysis showed that electronic invoicing strongly contributed to procurement performance in the Siaya County Government.

The fourth objective sought to examine the effect of electronic payment on procurement performance in Siaya County. The bivariate Pearson correlation showed that electronic payment and procurement performance were strongly and positively correlated. Additionally, the regression indicated that electronic payment had strongly contributed to procurement performance in the Siaya County government.

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5.3 Conclusion of the Study

The conclusion to the study was informed by survey findings. The conclusion is organized in terms of the relationship between each explanatory variable and dependent variable at a time. The explanatory variables included electronic tendering, electronic

sourcing, electronic invoicing and electronic payment as presented in the succeeding sub-section.

5.3.1 Electronic Tendering and Procurement Performance

The study concluded that electronic tendering moderately contributed to procurement performance in the Siaya County Government. The positive and moderate effect of electronic tendering on procurement performance in Siaya County is attributed to the capabilities of electronic tendering that result in enhanced procurement performance. Electronic tendering aspects such as managing of ongoing tenders, registration for supplies, tender publication and bid opening eliminate costs associated with paper tendering and improve tender performance hence procurement performance. Therefore, enhancement in the adoption and use of e-tendering in Siaya county government resulted in improvement in procurement performance. Electronic tendering aspects such as management of ongoing tenders on the electronic platform, online suppliers' registration for published tenders, online tender publication, online bids, bids opening and evaluation were critical in enhancing procurement performance.

5.3.2 Electronic Sourcing and Procurement Performance

The study concluded that electronic sourcing had strongly explained procurement performance in the Siaya County government. Electronic sourcing had the second highest positive effect on procurement performance in the Siaya county government after electronic payment. The finding indicated that an increase in the adoption and use of electronic sourcing resulted in improved procurement performance. Enhancing the adoption of electronic sourcing aspects such as need and requirement identification, online submission of proposals by prospective and online bids receipt and evaluation was

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associated with reduced lead time, enhanced cost efficiency and alignment of specifications with the actual needs and requirements of end-users or stakeholders. Indeed, improvement in the adoption of electronic sourcing by the county government resulted in improved procurement performance. Electronic sourcing was critical in enhancing the procurement performance of the Siaya County government.

5.3.3 Electronic Invoicing and Procurement Performance

The study concluded that electronic invoicing had significantly resulted in enhanced procurement performance of the Siaya County government. The findings showed that electronic invoicing had the lowest effect on procurement performance. The findings therefore indicate that electronic invoicing did not contribute much to procurement performance as compared to other aspects of electronic procurement such as electronic payment and electronic sourcing. The comparatively low effect of electronic invoicing on procurement performance in Siaya County is attributed to the low adoption of preparation of electronic invoicing and the continued creation of manual invoices. Therefore, improving the use of electronic invoicing by the county government in aspects such as compliance of invoicing with procurement law and accounting standards; electronic invoice submission to clients; online receipt of invoices from suppliers and electronic storage of sent and received invoices would have enhanced procurement performance in Siaya County government.

5.3.4 Electronic Payment and Procurement Performance

Based on study findings, the research concluded that electronic payment capability significantly explained procurement performance in the Siaya county government. The

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results showed that electronic payment had the strongest positive effect on procurement performance among all the elements of electronic procurement considered in the study. The strong effect is attributed to the role of electronic payment in curbing leakages of revenues collected, timely payment of supplies and thus supplier satisfaction and reduction of funds embezzlement. Such benefits of electronic payment result in enhanced procurement performance of Siaya County government in terms of its aspects such as the delivery of goods and services of high quality and transparent and accountable procurement to the electorates. Therefore, the enhancement of the use of electronic payment processes resulted in improved procurement performance in the Siaya County government.

5.4 Recommendations of the Study

The findings and conclusions have informed the recommendations to the Siaya County Government. The recommendations have been organised in terms of explanatory variables including tendering, electronic sourcing, electronic invoicing and electronic payment as presented in succeeding sub-sections.

5.4.1 Electronic Tendering

Given the moderate explanatory power of electronic tendering over procurement performance, the study recommends that the leadership of the Siaya County government enhance the adoption of electronic tendering capabilities. The study found that capabilities of electronic tendering such as online evaluation of bids and electronic communication on successful bids were under-implemented. The leadership Siaya County government should thus evaluate tenders based on the online platform. They

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should also communicate on successful bids based on the online tendering platform. This would enhance procurement performance in aspects such as cost efficiency, optimal inventory levels, consistent delivery of goods and services of high quality and a transparent and accountable procurement department.

5.4.2 Electronic Sourcing

The study established that electronic invoicing had the weakest contribution to procurement performance in the Siaya County Government. The study therefore recommends to the leadership of Siaya County Government to enhance the adoption and use of electronic sourcing capabilities that were not adequately implemented. The leadership should specifically focus on aspects of electronic sourcing such as electronic perspective suppliers' identification, electronic communication on successful bids, online tender committee negotiation and contract awards and online management of contract performance. Such capabilities would be critical in enhancing the procurement performance of the Siaya County Government.

5.4.3 Electronic Invoicing

The study found that electronic invoicing had the weakest explanatory power over procurement performance in the Siaya County government. The study thus suggests to top leadership of Siaya County to enhance the use of electronic invoicing capability in the procurement department. The leadership should specifically focus on aspects of electronic invoicing such as electronic backing up of copies of sent and received invoices, electronic creation and transmission of invoices to clients and electronic receipt of

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invoices from suppliers. Such adoption should result in improved procurement performance of the Siaya County Government.

5.4.4 Electronic Payment

The study established that electronic payment had the strongest effect on procurement performance in the Siaya County Government. The study therefore suggests to the top leadership of Siaya County to continue implementing electronic payment to even enhance the procurement function further. The improvement in the adoption of electronic payment capabilities enhances procurement performance. The leadership should specifically focus on improving the adoption of capabilities of electronic payment such as online reconciliation of payments and receipts, electronic receipt of payments from clients, and electronic payment to suppliers. This would enhance the performance of procurement in aspects such as transparency accountability and cost-effectiveness.

5.5 Recommendations for Further Research

This study focused on the effect of electronic procurement on procurement performance in the Siaya County Government. Future studies can examine other aspects of electronic procurement that were not within the scope of this study such as electronic informing, and electronic ordering among others. The model explained 74.6% of the variation in procurement performance in the Siaya County government. Therefore, another study ought to be undertaken on the unobserved variables that explained the remaining 25.4%. Further, future studies can be undertaken with the same variables in other countries to improve on generalization to the whole country. Future studies can also examine the

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effect of electronic procurement on other aspects of performance such as the sustainability performance of county governments in Kenya.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

Diana Awuor,

Postgraduate Student,

St Paul's University.

To The Employees of Siaya County Government

P.O BOX 803 – 40600,

SIAYA

Dear Sir/Madam,

RE: COLLECTION OF RESEARCH DATA

My name is Diana Awuor and I am a postgraduate student from St. Paul's University. The purpose of this correspondence is to provide you with an overview of the research I will be conducting and to seek your cooperation and support, as your involvement is crucial to the success of this dissertation. The title of my research is "Electronic Procurement and Procurement Performance in Counties in Kenya. A Case of Siaya County." I am reaching out to you with the hope of securing your cooperation and support for this research project. Your expertise and insights would greatly contribute to the success of the study in terms of providing me with needed data. I commit to maintaining confidentiality and adherence to ethical guidelines. I would appreciate the opportunity to discuss this research with you further. Please let me know if you are available for a meeting at your earliest convenience. Thank you for considering this collaboration, and I look forward to the possibility of working together on this exciting research endeavour

Yours Sincerely.

DIANA AWUOR

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APPENDIX II: QUESTIONNAIRE

This survey aims to gather information about the Study's title "Electronic Procurement and Procurement Performance in Counties in Kenya. A Case of Siaya County."

Please give answers in the spaces provided and tick (√) where appropriate:

SECTION A: GENERAL INFORMATION

1. What is your gender?

   Male [ ] Female [ ]

2. What is your age?

   Below 25 years [ ] 25- 35 years [ ] 36-40 years [ ] 41- 50 [ ] Above 50 years [ ]

3. What is your highest educational attainment?

   Certificate/Diploma [ ] Bachelor's Degree [ ] Postgraduate degree [ ]

   Others …….

4. How long have you worked in Siaya County Government?

   Less than 1 year [ ], 1- 2 years [ ] 3- 5 years [ ] 6 -10 years [ ] Over 10 years [ ]

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SECTION B: ELECTRONIC PROCUREMENT

5. Kindly respond by marking the item that matches your opinion with a tick (√) or cross mark (x).

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S/no	Statement	'Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree'
		1	2	3	4	5
	Electronic Tendering					

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S/no	Statement	'Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree'
		1	2	3	4	5
1	Electronic Tendering allows online tender publication					
2	Suppliers register for published tenders online					
3	Suppliers make a bid for tenders on the electronic platform					
4	Bid opening is done online					
5	The county evaluates bids online					
6	The county communicates electronically on successful bids					
7	The management of ongoing tenders is done on the electronic platform					
	Electronic Sourcing					
1	The need and requirement identification are done on the electronic platform					
2	The county procurement identifies prospective suppliers using electronic means					
3	The procurement department requests information from suppliers based on the electronic platform					
4	The county requests prospective suppliers to submit proposals on the online platform of the county.					
5	The county evaluates received bids using the electronic system					
6	The county selects and informs successful bidders using the electronic platform					
7	The tender committee negotiation and Contract award are done via electronic means					
8	The management of the contract performance is done via the online platform					
9	The procurement department uses electronic means to manage long-term relationships with Suppliers					

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S/no	Statement	'Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree'
		1	2	3	4	5
	Electronic Invoicing					
1	The invoices to be submitted to clients are created electronically					
2	Created invoices are transmitted electronically to clients					
3	The county finance department receives invoices from suppliers on the electronic system					
4	Invoices received from suppliers are processed electronically via the online system					
5	The invoicing complies with procurement law and accounting standards					
6	A copy of sent and received invoices is stored and backed up electronically					
	Electronic Payment					
1	Payment for supplies is initiated on the online platform					
2	The payment of suppliers is done via electronic means such as mobile money and bank transfer					
3	The county receives online receipts for payments made to suppliers					
4	The county receives payment via electronic means for services offered to the public					
5	Record keeping for payments made and received is done on the online platform					
6	Reconciliation of payments and receipts is done on the online platform					

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SECTION C: Procurement Performance

6. Kindly respond by marking the item that matches your opinion with a tick (√) or cross mark (x).

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S/no	Statement	'Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree'
		1	2	3	4	5
1	The procurement process in our organization consistently delivers goods and services of high quality.					
3	The procurement lead time has improved over the past year due to process optimization efforts.					
4	Inventory levels are monitored and adjusted on the online platform hence optimal quantities are maintained.					
5	Procurement specifications align with the actual needs and requirements of end-users or stakeholders.					
6	The county procurement department has achieved cost efficiency in its functions					
7	The county's procurement department is transparent and accountable to the electorates					
8	The inside users and the public are satisfied with goods and services procured by the county government					
9	The procurement processes are done according to existing procure laws					

Thank you for your kind cooperation

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APPENDIX III: NACOSTI PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **183533**

Date of Issue: **18/June/2024**

RESEARCH LICENSE



This is to Certify that Ms.. Diana Awuor of St. Paul`s University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Siaya on the topic: ELECTRONIC PROCUREMENT AND PROCUREMENT PERFORMANCE IN COUNTIES IN KENYA: A CASE OF SIAYA COUNTY for the period ending : 18/June/2025.

License No: **NACOSTI/P/24/36931**

183533

Applicant Identification Number

Director General
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See overleaf for conditions

APPENDIX IV: ISERC LETTER

ST. PAUL'S UNIVERSITY

Private Bag 00217 Limuru,
Kenya
Email: office@spu.ac.ke
Website: www.spu.ac.ke

Tel Office: +254 (0) 20-2020505/10
Mobile: +254 (0) 728-669000
(0) 736-424440

REF: SPU/171/2024 **Date: 3rd June 2024**

TO: Diana Awuor
St. Paul's University

Dear Diana,

==========

REF: Electronic Procurement and Procurement Performance in Counties in Kenya: A Case of Siaya County

==========

Greetings,

This is to inform you that SPU- Institutional Scientific Ethics Review Committee has reviewed the above-named research proposal. **Your ERB approval number is 180, for the period between 3rd June 2024 – 3rd June 2025 (1 year).**

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SPU- Institutional Scientific Ethics Review Committee.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SPU- Institutional Scientific Ethics Review Committee within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to *SPU- Institutional Scientific Ethics Review Committee* within 72 hours

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v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SPU- Institutional Scientific Ethics Review Committee.
viii. Please note that it is within the ISERC's mandate to monitor your research and to do random visits to the site. All research is subject to post approval monitoring.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,



Dr. Daniel Nzengya, PhD
Chairperson
SPU- Institutional Scientific & Ethics Review Committee

