EFFECT OF ELECTRONIC PROCUREMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE IN THE ENERGY SECTOR: A CASE OF ENERGY AND PETROLEUM REGULATORY AUTHORITY IN NAIROBI COUNTY, KENYA

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DECLARATION AND APPROVAL

This research project is entirely original with no submissions for awards or degrees to any other university.

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I certify that this research project has been submitted for review with my consent.

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DEDICATION

I dedicate this work to my colleges and family for their unwavering support and inspirational encouragement, as well as for believing in me. You have lifted me up with your prayers.

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I give thanks to the all-powerful God for giving me life and for his ample grace during my academic career. want to express my gratitude to my immediate family for their financial assistance as well as their moral support. In addition, I would like to thank Dr. Duncan Ndung'u Nderui, my university supervisor, for his support and direction, which were very helpful to me in finishing this study.

ABSTRACT

E-procurement is more than just an internet ordering platform. It is thought to be a critical performance indicator that can raise an organization's capabilities and performance. When e-procurement is implemented, some organizations succeed, while others fail. When it comes to procurement, the purchasing organization must accomplish a few fundamental goals. These include cutting down on how long staff members spend searching for a product and on how long and expensive it takes to manage purchases, services, or a reliable supplier. reducing cycle times, limiting the pool of potential suppliers to a select few in order to ensure quality, and increasing volume with a small number of chosen suppliers in order to negotiate better terms and pricing. The purpose of the study was to determine how an organization's performance is impacted by electronic procurement practices particularly in terms of efficiency. The precise goals were: to ascertain how electronic invoicing affects an organization's performance, how electronic materials management affects an organization's performance, and how electronic tendering affects an organization's performance. Value Chain Theory, Technology Acceptance Model, Innovation Diffusion Theory, and Resource Based View Theory all served as guiding theories for the study. This study employed a descriptive research design The study was carried out in Nairobi and specifically at Energy and Petroleum Regulatory Authority offices in Upper-hill, Nairobi. The study was conducted at EPRA, Nairobi targeting all the staffs. EPRA has 157 staffs in which seven are senior level, ten are middle level, one hundred and forty are lower level. Stratified sampling was employed for this study to ensure accuracy of the results. The employees at each level were considered as strata's. The Statistical Package for Social Sciences, or SPSS, version 21.0 computer program was then applied. In a descriptive statistical analysis, the essential characteristics of the data was characterized by frequencies and percentages. Regression statistics and Pearson's Product-Moment Correlation Coefficient was used in the inferential data analysis. Correlation analyses was used to quantify the relationship between the variables. This was significant because it allowed the analysis's findings to be applied to a wider demographic. Correlation results indicate that relationship between electronic tendering and organization performance was significant and positively correlated r (ET, OP) = 0.571, p<0. 001.This means that any positive adjustment in electronic tendering will lead to increased performance at Kenya Revenue Authority. In addition, electronic materials management was found to have a positive and significant correlation with supply chain performance r (EMM, OP) = 0.547, p <0.001. Furthermore, electronic invoicing at r (EI, OP) =0.526, p<0.001, was likewise revealed to be positively and significantly correlated with organization performance. Regression Results reveal that electronic tendering is statistically significant in explaining organization performance at Energy and Petroleum Regulatory Authority. This is supported by $\beta = 0.217$, p=0.001. It also revealed that electronic Materials Management is statistically significant in explaining organization performance at the Energy and Petroleum Regulatory Authority. This is supported by $\beta = 0.369$, p=0.001. For electronic invoicing in the model was significant ($\beta = 0.346$, $p = 0.001$) indicating that electronic invoicing significantly influences organization performance at the Energy and Petroleum Regulatory Authority. From the result the researcher was able to conclude that both electronic tendering, electronic materials management, and electronic invoicing was significant in explaining organization performance in the energy sector.

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LIST OF ABBREVIATIONS & ACRONYMS

EPRA-	Energy and Petroleum Regulatory Authority
ERP-	Enterprise Resource Planning
GDC-	Geothermal Development Company
IT-	Information technology
KENGEN-	Kenya Electricity Generating Company
KETRACO-	Kenya Electricity Transmission Company
KNEB-	Kenya Nuclear Electricity Board
KNEB-	Kenya Nuclear Electricity Board
KPLC-	Kenya Power & Lighting Company Limited
KPRL-	Kenya Pipe Line Ltd
MOE-	Ministry of Energy
MRP-	Material Requirement Planning
NACOSTI-	National Commission for Science, Technology and Innovation
NOCK-	National Oil Corporation
NOCK-	National Oil Corporations
RBVT-	Resource Based Theory
REA-	Rural Electrification Authority
TAM-	Technology Acceptance Model

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Procurement is basically the process of buying goods or services and it is often carried out by the process of tendering, rather than directly buying products from a seller in a process that does not involve bidding. An entity, company or organization, wishing to obtain goods or services will first specify its requirements then open a bidding in a process known as tendering. Traditionally, tendering has been predominantly paper based, using papers to document specifications and other documents associated with the bidding process. Tendering processes contains, at the high-level, compilations and finalization of tender documents, issue of the tender documents to tenderers, follow-up of tenderers and tenderer's submission of tenders, analysis of submissions and selection of tenderer, award of contract, and post-tender activities (Masterman, 2013)

Traditional tendering process has been used for a very long time and it has been very much understood and accustomed to. However, due to it been paper-based, it is labor-intensive that includes laborious work of managing receipts, recording and distribution of tender submissions. Consequences of the labour intensive tasks of the traditional tendering process include disqualification of tenderers due for example to responses arriving late as a result of courier or postal delays or incorrect addressing. The traditional tendering process cycle can be long, expensive, prone to human errors and corruption, and operates with demanding storage space for paper documents. With these significant drawbacks and the several socio-economic factors inherent in traditional tendering, a drive to seek alternatives to the traditional tendering process emerged (Masterman, 2013).

With the advent of internet-based technologies came what has now come to be known as E-tendering. The increasing availability and affordability of information technology systems is making ETendering attractive to organizations, replacing the traditional tendering process for procurement. E-Tendering is one of the systems used for E-Procurement and it is developing in all sectors making procurement process in organizations more efficient. E-Procurement uses the internet in the purchasing process for establishing contracts and purchasing goods or services in organizations. E-Procurement helps in reducing wastes, reducing business costs, streamlining purchasing processes, accessing wider markets and facilitating organized and open line of communication amongst stakeholders in the procurement process (Lindsley & Stephenson, 2008)

E-procurement has recently gained dominance in many organizations worldwide due to technological advancements which have made business operations easier, faster and more efficient in today's competitive global village. It encompasses all activities involved in obtaining goods and services and managing their inflow into an organization toward the end user through the internet (Lee et al, 2007). It also refers to the use of internet-based system to carry out individual or all stages of procurement process, including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom and Brandon, 2004). This has been facilitated by the growth in information and communication technology which has led to electronic commerce, commonly referred to as e-commerce. The growth in e-commerce has been significant in the adoption of new supply chain-related technology and applications by organizations globally. Like other functions embraced by e-commerce, the procurement function has positively been impacted with a predicted growth in e-procurement applications covering both transactional buying and strategic sourcing activities (Greunen et

al., 2010). The emergence of the internet as a means of doing business has served as a medium for major changes in the operation and status of organizational procurement. It is evident that ICT has totally transformed the way organizations and governments operate (Nelson et al., 2011). Nelson noted that the majority of organizational expenses consist of money used to purchase various products and services, and in order to decrease the total costs spent on purchasing process, internet technologies are used. Consequently, e-procurement has become popular to implement by governments and enterprises alike. Although the opportunities for improvement in e-procurement seem to flourish, both private and public sector organizations are still guarded as far as the adoption of electronic technologies is concerned (Klein, 2010).

Hossein et al. (2014) found that the emergence of internet meant that companies started turning their procurement activities towards internet since it would benefit them if all procurement processes are carried out correctly, efficiently and properly. In essence, e-procurement has the capacity to act as an integrative technology that enables integration and improvement of processes between departments. Flynn et al. (2010) define internal integration as the degree to which two departments collaborate in the management of both inter and intra departmental processes to provide maximum value for the firm. Researchers have argued that internal integration of various activities in an organization has the ability to enhance economic performance.

Because of the competition brought about by the use of advanced technology, businesses are adopting electronic procurement. If a business does not use electronic processes, it will not have a competitive advantage in the market (Masudin, et al. 2021). "E-procurement," also known as electronic procurement, is the process of purchasing and selling goods. services,

and consulting over the internet by companies, individuals, and the government (Chen, et al., 2021). The term "electronic procurement" describes the combination of web-based database systems and integrated ordering, receiving, and payment processes. In order to save money, resources, and time, it also entails the electronic purchase of goods and services. Since e-procurement is still relatively new, public organizations have not yet fully embraced its use. Online procurement is one of the primary drivers of the global shift toward economic and social aspects. In this era, where their adoption has improved public organization activities toward their customers, information and communication technology is the backbone of industrial and commercial activities necessary for human survival (Saleh, 2018). A more cost-effective total solution, higher client satisfaction, superior products, a reduced lead time, and innovative concepts and methods are some of the advantages. Adopting e-procurement also has the benefit of allowing a buyer and a seller or supplier to collaborate and integrate data via the internet. Enterprise Resource Planning (ERP) was first used by organizations in the 1970s and later expanded to the commercial internet. World wide web multimedia first appeared in the 1990s, offering the necessary resources and facilitating the computerization of procurement (Iles, 2017).

Electronic Procurement

The way businesses are managed has changed significantly over time; companies are now responding more to outsourced services than to traditional multipurpose service functions or specialized in-house service functions. Many businesses have benefited from increased operational efficiencies thanks to information technology (IT), which offers electronic solutions and internet-based supply chain network solutions. A plethora of innovative e-commerce technologies surfaced in the late 1990s, revolutionizing work practices and posing

a threat to established business models (Chan & Lu, 2019). Businesses all over the world are adopting new supply chain-related technologies and applications as a result of the growing use of e-commerce in business-to-business markets (Sheng, 2017).

In a survey carried out across Europe, Palma dos Reis and Soares Aguiar (2016) looked into the factors that contributed to Portugal's adoption of electronic procurement systems. The respondents were managers from 240 sizable businesses in the manufacturing, services, and commercial sectors. The authors discovered positive relationships between trading partner readiness (environmental context), firm size (organizational context), and technological capabilities (technological context). A 2016 study by Nagle et al. found that E-procurement systems are impacted by B2B relationships. The authors carried out an extensive field investigation in six carefully chosen businesses to demonstrate how adversarial type relationships affect E-procurement systems in the sourcing phases.

According to Hawkinget al. (2008), procurement of goods and services represents the single largest cost item for any given enterprise since for each revenue a company earns on the sale of a product more capital is spent on the procurement of materials and services to support the business's operations than on all other expense items combined (Hawking et al., 2010). In recent past, there has been increased adoption and usage e-procurement in major procurement functions of United Nations Agencies. The adoption of e-procurement 4 in UN Agencies could be influenced by several factors, besides that of integrating the buyer in the procurement system within the organization in a bid to procure the right products, at the right price from the right supplier in addition to accountability in the organization expenditure. The potentials of e-procurement have already been proven in a number of studies (Aberdeen, 2001). According to these studies, e-procurement enables companies to decentralize

operational procurement processes and centralize strategic procurement processes as a result of the higher supply chain transparency provided by e-procurement systems (Puschmann & Alt, 2005). However, there is limited empirical literature on the impact of e-procurement on performance of UN Agencies.

E-Tendering is an internet-based process of inviting offers from suppliers and receiving their responses electronically and exchanging tender documentation electronically to facilitate the procurement of goods or services, and the award of contracts. At its simplest, Electronic Tendering can be considered as the electronic exchange of any tender documents as part of the procurement process (Sunmola & Shehu, 2020). E-Tendering replaces the use of paper-based tender processes with an electronic medium for submitting, receiving, communicating, publishing and accessing any information or documentation related to a tender on the internet. It facilitates the integration and management of business processes that produce value for customers within a firm and across the firm (Vijayaraman & Bhatia, 2002). E-Tendering has enhanced tendering practice in several ways. Benefits attributed to E-Tendering include reduction in the cost and time taken for the tendering process, simplifying the tendering process, increased competitiveness of the tenderers' proposal, support in analyzing the tenders, an improved medium of communication between the parties, enhanced response rate to inquiries, effective engagement of market mechanism, less corruption, reduced supplier collusion, consistent tendering practice and fairer assessment of tenders (Ibem & Laryea 2017).). E-Tendering barriers in companies include lack of support by management, lack of IT infrastructure, concerns of interoperability, IT systems cost, screen-toface agreement versus traditional face-to-face agreement, workforce technical capability and awareness, and sometimes unaccepting company culture, and the legality that governs

the use of the technology (Alshawi, & Alalwany,2017).

When issuing and receiving some or all tender documents in electronic format, it is essential that there is a clear understanding amongst all parties concerned as to the nature and intent of the transactions. E-Tendering barriers in companies include lack of support by management, lack of IT infrastructure, concerns of interoperability, IT systems cost, screen-toface agreement versus traditional face-to-face agreement, workforce technical capability and awareness, and sometimes unaccepting company culture, and the legality that governs the use of the technology (Alshawi, & Alalwany 2017). When issuing and receiving some or all tender documents in electronic format, it is essential that there is a clear understanding amongst all parties concerned as to the nature and intent of the transactions. Although E-Tendering is expected to benefit the organization, the extent to which they use E-Tendering, however, differs. One of the success indicators of E-Tendering systems, depends on the ease or difficulty of the customer experience (Li & Li 2018).

Lean supply chain management is a comprehensive production management system developed by Toyota in Japan but perfected by other scholars and organizations that deals with elimination of waste and reduction of error reduced inventories costs bringing about efficiency and effectiveness. With the introduction of concepts like JIT (Just in Time) and VMI (vendor managed inventory), it is paramount that best practice organizations introducing lean supply chain management practices identify strong suppliers and develop those suppliers into partners. The report further states that a diverse supplier base and mentoring of suppliers by the buyer means that efficiency and effectiveness is achieved in service delivery. When conducting a new supplier appraisal whether electronic or manual, assessment emphasis is put on product quality, planning, supply assurance, customer focus

and change control, (KPMG, 2017), A supply chain of a certain product or a service essentially has three main parts, the supply, manufacturing and distribution. The supply side concentrates on how, where from and when raw materials are procured and supplied to manufacturing. Manufacturing converts these raw materials to finished products and Distribution ensures that these finished products reach the final customers through a network of distributors, warehouses and retailers. Effectively managing these flows can impact virtually all e-material supply chain, leading to profitable policies for continuous improvements in areas such as data accuracy, improving material quality, reducing lead times and reductions in operational complexity. Other benefits include: Improved delivery performance such as quicker customer response and fulfillment, rates especially in the field of IT which is changing very rapidly, greater productivity and lower costs, reduced inventory throughout the chain, improved forecasting precision of demand, enhanced inter-operational communications and cooperation and more reliable financial information.

Materials management is an essential function that improves productivity in projects. Hence, the efficient use and management of material have an important influence on a company's profit and can avoid delays. In terms of purchasing and supply of materials, not matching materials with the ordering purchase, forgetting ordering materials, over or less materials, early or late materials arriving, lack of JIT strategy, lack of training and adequate management, lack of communication and relation between contractor and supply chain companies are the main obstacles. Some common problems on material management are more obvious which are namely: Failure to order on time which delays the projects; Delivery at the wrong time which interrupts the work schedule; Over ordering; Wrong materials or error in direction of materials requiring re-work; Theft of materials from delivery into

production; Double handling of materials because of inadequate material handling techniques. In terms of logistics, the main problems are wrong time of materials arriving to the site or even wrong quality, lack of information for materials arrival to the site or site stock, missing materials, unavailability of storage space, and waste of labour for materials searching on site. Technology can help to improve the tracking and delivery of the materials. Consideration can be given to how GPS, JIT, EOQ can be used to in managing the process using E-material management, (Sushil & Martin 2018).

Global perspective of Electronic Procurement

E-procurement systems help the enterprise and its suppliers exchange information, according to a study on e-procurement and supply chain performance in China (Chang, Tsai & Hsu, 2013). Exchange of information strengthens ties between businesses. Studies conducted in China have shown that the use of ICT in schools is significantly influenced by ICT infrastructure. The results of the study suggest that creating multimedia classrooms could significantly increase the amount of ICT used in the classroom. To fully benefit from ICT, students should receive training on how to use the new technologies (Chun, Chin-Chung & Wu, 2015). According to a study by Fuchs et al. (2018) on the role of IT in automotive supply chains, IT functional capabilities have the biggest impact on internal process excellence. Consequently, this enhances the performance of suppliers, potentially resulting in better supply chain outcomes. The relationship between supply chain capabilities, IT capabilities, and supplier performance was examined in the study. It was found that the UK public sector's adoption of electronic procurement improved supply availability, decreased maverick spending, enhanced communication, and enhanced negotiation. Maverick buying is significantly impacted by the level of support given to internal users in utilizing the new

technology. Improvements to the procurement system led to lower costs for processing purchase requisitions, which in turn reduced the overall cost of obtaining goods and services (Croom & Brandon-Jones, 2017).

Regional perspective of electronic procurement

In Africa, combating corruption, and building capacity in procurement has helped governments maximize the buying power of their budgets and improve the quality of service delivery to their citizens especially the marginalized. Competitive and transparent public procurement systems are seen as a key element to achieving sustainable development and more prosperous marginalized group in Africa. In Ghana, e-procurement system holistically tackles underlying issues affecting hospital performance such as lack of access to information for civil society partners and the public. In South Africa, the implementation of the Preferential Procurement Policy Framework Act 5 of 2000, gave effect to section 217(3) of the Constitution of the Republic of South Africa of 1996, by providing a framework for the implementation of a fair public preferential procurement policy. Driven by the increasing trend toward purchasing inputs and other raw materials from outside the organization, implementing electronic procurement (e-procurement) has become a significant tactic in most companies' e-business strategies (Deloitte Consulting, 2001). Today baseline procurement capabilities are rapidly becoming a cost of doing business. More and more companies are conscious of the needs to introduce Internet-based technologies in their order process, due to the benefits of saving transaction cost, increasing competitive sourcing opportunities, and enhancing inter-organizational coordination. Internal customer satisfaction, through E-Procurement function can usually contribute to the competitive position of any company in many other ways than first through cost serving Van Weele

(2014) presents a few of these was such as: reduction of quality cost –e- 25 procurement can reduce quality costs by making sure that selected suppliers deliver a product of service that does not exceed extensive quality control. E-Procurement can also reduce quality costs by making sure that the components bought do not load to complaints on the user department 12 or final product to the customer. Product standardization internal customer satisfaction can be enhanced through E-procurement due to the product variety concept. This can be achieved by reducing the number of different components and or the number of suppliers via set product standards. Contribution to product design and innovation of then innovation in industry come from suppliers or are results from intensive interactions between suppliers and user department in any organization. According to a study conducted in Uganda by Kakwezi and Nyeko (2010), the procurement departments of public entities in Uganda lack reliable information about the procurement process, including its inputs, outputs, resource consumption, and outcomes, making them unable to assess the effectiveness and efficiency of their procurement processes. Tanzania is having difficulty adopting and utilizing electronic procurement due to problems with people, ICTs, policy and legislative frameworks, institutional structures, and procurement procedures (Sijaona, 2010). Tanzania has acknowledged the potential benefits of electronic procurement; however, Suleiman (2015) and other studies demonstrate that the country lacks the technological infrastructure, legal frameworks, and procedural tools necessary to fully implement electronic procurement. In Ruzindana and Kalaskar's (2016) study on the adoption of electronic procurement and its effect on the Procurement Performance of Selected Telecommunication Companies in Rwanda, the researchers found that Ruanda's organizations must address perceived risks related to internet connectivity in order to increase employee adoption.

Local perspective of electronic procurement

An e-procurement project has also been launched by Kenya's Ministry of Finance, with the intention of first deploying the system in a select few ministries before extending it to all other government departments (Shale, 2015). Several private companies in Kenya have successfully incorporated e-procurement technology. Gitahi (2011) used Nation Media Group as an example, which allows its customers to make online purchases via their digital platform, N-Soko. A 2015 study by Mwangi and Mburu on the effect of ICT on procurement performance in Kenyan star-rated hotels found that the way these establishments offer services has changed dramatically as a result of ICT use. Despite the benefits of ICT adoption in procurement, there appears to be a sluggish uptake of the technology, according to the evidence that has accumulated (Muriuki,2021).

In Kenya, just like other countries the world over, businesses are embracing the technological applications and use of ICT tools to ensure that their business dealings and operations are made faster, convenient, easier, reliable, and operational across business hours and beyond (Jesse, 2013). For instance, both small and large organizations have embraced ICT and their business environment is thriving because of positive adoption and implementation of e-procurement (WTO, 2013). This is because in comparison to traditional procurement, the use of e-procurement reduces the cost per transaction by 65% (Davila, Gupta & Palmer, 2003). Moreover, companies using e-procurement system reported that they achieve saving up to 42% in purchasing transaction cost as a result of less paperwork, which enabled transaction processes to be less prone to errors, leading to more efficient purchasing (Flynn et al., 2010).

Energy sector in Kenya

One of the three "pillars" of Vision 2030's infrastructure is energy. The petroleum subsector (both upstream and downstream), the electricity subsector, and the renewable energy subsector are the three main subsectors that make up the energy sector. The energy sector has grown to include more players over time with the adoption of the Sessional Paper No. 4 on Energy in 2004 and the passing of the Energy Act No. 12 of 2006. All regulatory functions, such as overseeing, monitoring, and enforcing sector regulations, setting tariffs, and coordinating the development of indicative energy planning, are under the purview of the Energy and Petroleum Regulatory Authority (EPRA). The Sector-wide policy and direction are under the jurisdiction of the Ministry of Energy (MOE). Kenya Power & Lighting Company Limited (KPLC), Kenya Pipe Line Ltd (KPRL), Kenya Nuclear Electricity Board (KNEB), Kenya Electricity Generating Company (KENGEN), Kenya Electricity Transmission Company (KETRACO), and National Oil Corporation (NOCK) are the nine state corporations or parastatals in the energy sector listed by the MOE (2015). Among the nine is the Rural Electrification Authority (REA). One of the infrastructure components that supports the economic pillars of Vision 2030 is the energy sector (RoK, 2013). The largest expense in the energy sector is related to procurement. In Kenya, direct purchases of goods, services, and works accounted for about 45% of the budgets of national Ministries, Departments, and Agencies in 2014–15 (Ochieng & Muele, 2014). Along with better service delivery, improved procurement performance will result in significant savings (Maurice, 2014). Massive corruption has characterized the ineffective and inefficient procurement functions in the energy sector (Cherop, 2016). According to research, some of the variables affecting procurement performance in the energy sector are staff competency,

planning, resource allocation, and contract management (Kiage, 2013). The Act of 2015 on Public Procurement and Disposal (PPDA, 2015), which governed state corporation procurement and replaced the Public Procurement and Disposal Act of 2005. One of the primary barriers to Kenya's economic expansion is the country's high energy costs (KIPPRA, 2005). A lax legal and regulatory framework for the exploration, exploitation, and development of energy resources is one of the other issues, along with the over-reliance on hydropower that is susceptible to changes in climate and hydrology, the high cost of rural electrification projects, system loss in both transmission and transportation, inadequate storage infrastructure for strategic petroleum product reserves, and the volatility of global crude oil prices (RoK, 2015). Based on statistical data, Kenya spends four times as much as South Africa and three times as much as China on electricity (KIPPRA, 2005). Among the other difficulties are the comparatively high cost of petroleum when compared to other East African nations, as well as frequent power outages and interruptions.

The country's economy benefits greatly from EPRA. At the moment, Kenya produces roughly 1.762MW of electricity, which is used nationwide. Kenya Power is a limited liability company that is in charge of distributing, retailing, and transmitting power across Kenya. Over 850,000 customers are served by Kenya Power, which also owns and runs the country's transmission and distribution network (Kenya Power: Project Mwangaza Bulletin). Petroleum products entering the nation through the Port of Mombasa are coordinated by the Ministry of Energy and Petroleum. 9,212,196.87 cubic meters were used between 2020 and 2023 (EPRA statistical reports, 2023).

1.2 Statement of the Problem

In Kenya, the Government has enacted The Public Procurement and Asset Disposal Act, 2015, to ensure compliance with procurement regulations and promote fairness in the expenditure of public funds (Gathima & Njoroge, 2018). However, despite these provisions, the performance of the public procurement function in Kenya has been a persistent challenge, with reports of shoddy works and poor-quality goods and services (Masindano et al., 2018). Inefficient procurement practices have led to significant wastage of funds, with an estimated 25% of government spending on public contracts being wasted due to inefficiencies (World Bank, 2022). The energy sector, in particular, has faced issues in adherence to procurement regulations, as indicated by the Public Procurement Regulatory Authority (PPRA), where only 60% of procurement entities in the energy sector complied with regulations (PPRA, 2019). The consequences of poor procurement practices within the energy sector are substantial. A study by the Institute of Economic Affairs (IEA) in Kenya revealed an annual loss of approximately 17 billion Kenyan Shillings (USD 160 million) due to inefficient procurement practices in the energy sector (IEA, 2020). According to the Energy and Petroleum Statistics Report (2020), the energy sector's procurement costs have been steadily increasing over the past years, eroding profitability and affecting the sector's ability to provide affordable energy to consumers. The report also highlights instances of subpar product and service quality within the energy sector, leading to increased customer complaints and potential safety hazards. The Energy Supply Chain Efficiency Survey (2022) conducted by the Ministry of Energy and Petroleum reveals that order fulfilment rates in the energy sector have consistently fallen below the desired benchmarks, causing delays and disruptions in the energy supply chain. The Kenya Power corruption scandal in 2018 further

exposed irregularities and fraudulent activities in the procurement process, leading to inflated costs, substandard equipment, and financial losses (TheStar, 2018). The Auditor General's Report (2022) also highlighted violations of public procurement rules by Kenya Power and Generating Company (KPLC), including poor procurement planning, misuse of procurement methods, and non-compliance with procurement regulations. Furthermore, claims of corruption in the energy sector's procurement procedures were acknowledged by the Presidential Taskforce on the Review of Power Purchase Agreements (PPAs) (PPA Taskforce, 2021). The Taskforce observed that KPLC's aggressive connection targets led to a rise in its contracted-out grid construction projects and unrestricted acquisition of dubious-quality poles, meters, and transformers. The Taskforce recommended substantial reforms, including the replacement or repositioning of all staff in the entire procurement department at KPLC. While many researchers have studied Kenyan procurement practices, Mutangili (2019) looked at the difficulties in implementing e-procurement in large-scale manufacturers in the country's capital. According to Matano Musau and Nyaboga's (2020) analysis of the functions influencing the application of e-procurement, the success of e-procurement implementation depends critically on top management support. Most of the authors have emphasized on other aspects of procurement. Based on this rationale, the current study looked at how electronic procurement affects organizational performance among Kenyan energy sector firms in an effort to close the current knowledge gap.

1.3 Purpose of the Study

This study purposed to examine the impact of electronic procurement on organization performance in the Energy sector, a case of Energy and Petroleum Regulatory Authority, Kenya.

1.4 Objectives of the study

i. To determine the effect of electronic tendering on organization performance of firms in the energy sector in Kenya.

ii. To assess the effect of electronic materials management practices on organization performance of firms in the energy sector in Kenya.

iii. To evaluate the effect of electronic invoicing on organization performance of firms in the energy sector in Kenya.

1.5 Research Questions

i. What is the effect of electronic tendering on organization performance of firms in the energy sector in Kenya?

ii. What is the effect of electronic material management on organization performance of firms in the energy sector in Kenya?

iii. What is the effect of electronic invoicing on organization performance of firms in the energy sector in Kenya?

1.6 Significance of the study

The government, the private and public sectors, researchers, procurement agencies, suppliers, customers, and EPRA's procurement departments will all benefit from the study.

Obtaining reference materials will be beneficial to researchers working on this topic.

Private sector will gain from this study by obtaining more knowledge on how E-procurement works.

The public sector will be able to reduce the difficulties associated with e-procurement because they will receive guidance on how to overcome these difficulties and apply procurement principles.

Procurement agencies will benefit from it by being able to more easily implement e-procurement in the public sector and improve their use of digital methods.

1.7 Scope of Study

His study was limited to the impact of electronic procurement on organization performance focusing EPRA (HQ). Specifically, the study focused on electronic invoicing, electronic material management practices, and electronic tendering. Data was collected from both technical and supporting departments of the organization, which included Oil and Gas, Electricity and renewal, Economic Regulations, finance, and administration. The study used closed questionnaires. The study took a minimum of three months.

1.8 Limitation of the Study

It became apparent that some responders were not cooperating in providing information that they deem as confidential because of the sensitivity of the office they operated in. Time factor on the side of respondents also became an issue in that some respondents were not ready to fill the research instrument and return them in time.

1.9 Delimitation of the Study

As a way of overcoming the limitations, the researcher had to guarantee respondents complete confidentiality of the data in order to get around the aforementioned restrictions. There was ample time for respondents to complete the questionnaires. The investigator guaranteed that the sample size utilized was indicative of the intended population. The data collection tool underwent a validity and reliability test to guarantee that it was properly structured.

1.10 Assumption of the Study

It was anticipated that the respondents to the research instruments would be truthful, cooperative, factual (objective), and reliable. Additionally, it was believed that people would answer the research questions and that the intended sample for the study could be reached. Furthermore, it was expected that the respondents would provide frank and impartial responses.

1.11 Operational definition of terms

Electronic Procurement: E-procurement, is the application of ICTs to some or all of the procurement process's steps, such as sourcing, negotiating, ordering, receiving, and post-procurement review.

Organizational Performance: refers measuring the financial and non-financial outcomes of a company's operations and policies. The firm's effectiveness, efficiency, dematerialization, quality services, and value creation are all indicative of these outcomes.

E-tendering: is a process for choosing a contractor or supplier. It aims to decrease collusion and face-to-face transactions by finding a qualified contractor or supplier through internet-based ICT infrastructures or electronic transactions.

Electronic Invoicing: In the end, this document defines and facilitates payment. For suppliers without automated electronic invoice generation systems, e-procurement should be able to receive and process electronic invoices. In addition, it should offer a simple online creation method via document scanning or supplier portals.

Electronic Materials Management: is the electronic management and control of goods using technologies like radio frequency identification and bar coding, from point of acquisition to delivery at the point of use.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The impact of electronic procurement on EPRA's organizational performance was examined in this chapter. Analyzing the theoretical review, conceptual framework, empirical review, and literature summary are among the goals.

2.2 Empirical Review

With the deployment of a secure electronic procurement platform, the procurement officer will no longer be able to tinker with bids, as Du, Foo, Gonzalez-Nieto, and Boyd (2005) explain. When suppliers register on the platform a certification authority provides them with identities and cryptographic keys. Suppliers submit their digitally signed bids to an electronic tender box, and only after the closing time of the tender will the procurement officer perceive a key to decrypt the bids. The World Bank requires that all supplier bids use an electronic system that "maintains the integrity, confidentiality, and authenticity of bids submitted, and uses an electronic signature system or equivalent to keep bidders bound to their bids" (World Bank, 2014). Eadie et al. (2007) argues that e-procurement allows sections of electronic documentation to flow through the supply chain; it improves the speed of returns and subcontractor price visibility. He further notes that since it is easier to communicate requirements in a quicker more accessible manner, it will result in a better understanding of requirements and due compliance besides allowing clients to gauge the state of the market by seeing how much interest is shown in the tender. It therefore becomes 14 relevant, which this paper does, to examine the effect of e-tendering on performance of UN agencies in Kenya. This will enable users to fill existing knowledge gap in this area.

2.2.1 Electronic Tendering and Organizational performance

E-tendering refers to the use of web based technology in sending invoice and purchases requests to suppliers. Supplier responses are also received online as part of the e- tendering process. E-tendering is a secure platform that allows suppliers and buyers to carry out their transactions online. According to Teo (2009), electronic tendering system encompasses the entire tendering procedure from advertisement of tender requirements to contract placement. All the required documents are also electronically exchanged online According to Smart (2010) E-reverse auctioning is real time, an online bidding process where the winner is the lowest bidder. The suppliers are given the contract by the customers who bid for them to get the business. The lowest bidder in this case is considered to be the winner. It is a strong negotiating weapon that enables several interested parties to bid and others to sell. This gives room to competition, increasing the competitiveness and improving the price at which goods and services can be sold. E-reverse auctioning involves use of internet in bidding products in real time.

E-tendering is part of e-procurement. Procurement refers to the use of internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Muhia & Afande, 2015). Procurement is one department that can contribute tremendously to the organization's efficiency and effectiveness if managed properly. If the procurement department bought all that is required in the organization at the right time, price, place, quantity and quality all other departments within the organization would derive great benefits from this and would thus be able to serve their customers (both internal and external) better (Kauffman and Kriebel, 2010). If, however, the

procurement department is inefficient in its acquisition of goods and services or even works, other departments would be adversely affected and sometimes the consequences can be grave.

E-sourcing involves the process of obtaining bids from different suppliers via a single online portal. It refers to internet-enabled applications and decision support tools that facilitate interactions between buyers and suppliers through the use of online negotiations, online auctions, reverse auctions and similar tools. The benefits of e-sourcing include streamlining the sourcing process, reducing prices by maximizing supplier competition, and creating a repository for sourcing information (Chan and Chin, 2007). Best Practice Network (2004) considers e- sourcing as a strategic process to establish, manage and monitor contracts and as an essential part of e-procurement. According to Aberdeen Group, reported by Best Practice Network (2004), a well-managed sourcing process should prioritize organizational requirements, understand supply market, select the supplier best placed in satisfying organizational needs, negotiate for the best overall value, establish and manage relationships with suppliers, develop cost reduction strategies and enhance long term performance of the purchasing operations and in turn the procurement performance.

Ronchi et al. (2010) concentrated on the significance of information technology on electronic procurement system. Six benefits were identified in this study and were classified as follows; lead time opportunity cost, Order cost, opportunity cost of capital and administrative cost on which decentralization and financial performance is calculated. Organizational performance is assessed through supply-base rationalization, maverick-buying reduction, transparency and control. This classification was an attempt to establish the value of electronic procurement in firms. The study was done as a general empirical review without focusing on

any specific industry as opposed to the current study which was confined to the dairy sector only.

Calipinar and Soysal (2012) analyzed e-Procurement in the health sector in Turkey. The study adopted a case study strategy. The researchers established that with little time and financial investment, saving considerable time and money can be ensured by using the proposed advice given to pharmacies working in hospitals. The study concluded that generally electronic procurement in less developed countries can be seen by academics and practitioners with e-procurement adoption by pharmacies located in Turkey. The study was based on health sector while the present study looked at the dairy sector in Kenya.

Amin (2012) conducted a study on the effects of e-procurement on organizational performance among commercial state corporations in Kenya. The study sought to find out the extent of e-procurement adoption among commercial state corporations in Kenya as well as find out how e-procurement affected performance in commercial state corporations. The sample size comprised of forty respondents who were sampling through stratified sampling technique. The results indicated that e-procurement had been adopted in commercial state corporations however certain procurement functions were still being carried manually. The study however did not look at other firms in the private sector.

According to Roma and McCue (2012), e-procurement is the application of information technology with a view to creating a procurement process which satisfies the dynamics within the environment. At one point or the other, all countries will embrace the electronic procurement concept. Specifically, in the public sector, e-procurement is driven by social, cultural and political factors (Garran, 2005). Implementation of e-procurement in public

procurement requires resources and specialized skills. In addition, the process requires a well-coordinated change management system and training program (Garran, 2005). It is also important to put into place practices, processes and systems for the implementation of e- 10 procurement (Vaidya, Sajeev & Callender, 2006). Other factors that are critical in the implementation of e-procurement include good governance and capacity developments (United Nations, 2011).

Kamarulzaman and Mohamed (2013) conducted a study on application of e-procurement technologies for selecting suppliers of agro-based small and medium enterprises in Malaysia. The study further sought to find out the extent to which small and medium enterprises were willing to increase the use of electronic application system in supplier selection. Data collection was done using an online survey where the findings indicated that security, commitment, cost, quality, efficiency, legal environment and delivery acceleration affect the extent of e-procurement adoption and application among agro based small and medium enterprises. The study however looked at the entire agro based industry while the current study narrowed down to dairy sector in Kenya.

Mose, Njihia and Magutu (2013) carried out a study to establish the factors affecting e-procurement projects success using a descriptive approach. The results indicated that most of the large scale manufacturing firms in Nairobi had implemented electronic procurement such as receipt of online submission of proposals, advertisement of tenders online and online short listing of suppliers. The study did not show a link between e-procurement implementation and supply chain performance but rather focused on the challenges in e-procurement adoption.

Nzuve (2013) conducted on a study focusing on implementation of e-procurement practices among private hospitals in Nairobi, Kenya. The study found that e-procurement had been implemented to a moderate extent by the NHIF accredited hospitals. Factor analysis was applied to identify factors that affect implementation of electronic procurement. These factors include: risk perception, end user training, existing technology, top management support, supplier systems integration, implementation strategy and vendor support. The study focused on e-procurement practices but the current study focused on e-procurement implementation.

Koorn, Smith and Mueller (2001), cited by Vaidya et al. (2006), discussed two types of e procurement systems: seller e-procurement system and buyer e-procurement system. Implementation of these two systems require a workflow system integrated with an e-procurement application that supports requisition to payment and the electronic catalogue that lists supplier's items and prices over the internet (Vaidya et al., 2006). According to Aberdeen Group (2001), most e-procurement solutions are developed to address one of the three primary areas of procurement operations: indirect procurement, direct procurement and sourcing. Other organizations adopt e-procurement to enhance organizational flexibility, strategic flexibility, technical flexibility and environmental flexibility (Shirzad and Bell, 2012). According to Roma and Mc Cue (2012), tools such as E-Notice, E- Auction, E-Catalogue, E-Dossier, E-Submission and E-Signatures are part and parcel of e- procurement. Dimitri (2013) discusses scoring in government e-tendering. Arozamena and Weinschelbaum (2009) call this behavior the direct effect of corruption, which assumes that the honest suppliers are unaware of the corruption scheme.

Sharifai, Mbaraka and Agaba (2013) conducted a study on the effects of e-procurement and

performance of service organizations in Uganda. The findings indicated that there was a connection between electronic procurement and the performance of the service organizations that were selected. Descriptive research design was used in this study applying both quantitative and qualitative methods. The study found out that there was significant relationship between electronic procurement and performance of service organizations. This conclusion came because IT has been embarrassed in all spheres of life to an extent that almost everything revolves around use of information technology. This research mainly focused only on service organizations in Uganda not in Kenya.

Makali (2015) focused on the contribution of electronic procurement to procurement performance in supermarkets in Nairobi. The aim of the study was to assess the adoption of e-procurement in the supermarkets in Nairobi, to evaluate procurement performance in the supermarkets in Nairobi and to determine the contribution of e-procurement to procurement performance in supermarkets in Nairobi. Due to small number of supermarkets in Nairobi, a census survey was done. The findings in this study show the most critical practices that contribute greatly to procurement performance in supermarkets are e-tendering, e-requisitioning and e-sourcing. The study only dealt with supermarkets in Nairobi while the current study focused on the dairy processing firms in Kenya.

Kamotho (2014) looked into Kenyan state corporations' E-Procurement and procurement performance. The study's conclusions showed that electronic invoicing and tendering have significantly improved performance. The reduction of order transmission errors, inventory reductions, guaranteed supply, and production stoppages have all been realized as a result. Additionally, the entire "requisition to payment" process has seen a decrease in work content, transaction costs have been decreased, the procurement process has taken less time to

complete, vendor-buyer relationships have been strengthened, procurement resource utilization has improved, enhanced agreements, as well as the provision of best-value contracted goods and services, have all been made sure of.

Gathima and Njoroge (2018) investigated how the Nairobi County Government performed in relation to e-tendering. The study was directed by the theories of transaction costs and innovation diffusion. Both the explanatory and descriptive research designs were used. Seven hundred and fifty respondents from the information technology, payment, and finance departments made up the target population. 75 respondents were chosen by stratified random sampling from among the three departments to make up the study sample. Questionnaires were distributed to the selected sample in order to collect data. The correlation study's conclusions demonstrated a positive and significant positive correlation between the Nairobi City County Government's performance and e-tendering processes, with a 95% confidence level. In order to maintain the quality of its operations, the study suggested that Nairobi City County give careful consideration to adopting and putting into practice various e-tendering features.

Mwangi and Kagiri (2016) sought to find out the relationship between e-procurement and procurement performance in hospitality industry in Kenya. This study was descriptive in nature hence used descriptive design. The study was a case of Sarova chain of hotels and adopted a descriptive research design. The study revealed that through e-tendering, compliance to policy at Sarova Chain of Hotels has improved as the hotel can quickly procure products and services from preferred suppliers and are unable to create maverick purchase. The study further revealed that e-informing influences the procurement performance of Sarova Chain of Hotels to a great extent –because electronic procurement has the potential

to reduce the total cost of acquisition. The study only focused on the hospitality industry while the current study looked at the dairy industry in Kenya.

2.2.2 Electronic materials management and organization performance

For operations to run smoothly and activities to be carried out continuously, an organization needs enough materials, and the goods and services must adhere to the necessary standards. According to Jermsittiparsert, Namdej, and Somjai (2019), these procedures enable an efficient flow of goods from the delivery stage up to storage and finally issuing to the final user. Prior to being delivered and invoiced, every product that has been purchased should be checked. Electronic material management makes this process easier to understand.

Effective electronic material management can lead to a number of benefits, such as improved data accuracy, better quality and quantity, shorter lead times, simpler operations, better delivery performance, lower costs, higher productivity, lower inventory costs, and easier accountability and transparency. The products are electronically tracked at all times. This helps to guarantee that no product is destroyed or misused when there is an excess of it. Product tracking helps a company determine the precise balance without having to make assumptions (Ancheta, 2017).

As per Maggioni, Giliberti, and Panunzio (2021), the implementation of electronic material management practices facilitates the enhancement of other product-related aspects within the organization, such as production process scheduling, bill of material fastening, and inventory level maintenance via Material Requirement Planning (MRP) and (MRP11). Manufacturing capacity and the advantages of MRP are integrated through manufacturing resource planning (MRPII). By installing coding software, the procurement head assigned to the warehouse can

track electronic products. This software counts products in the warehouse by assigning numbers, and it also helps warehouse staff identify products that aren't available for purchase (Ancheta, 2017).

It lowers the cost of ordering and holding goods by ensuring that they are stocked to order. The following factors can make material management practices less effective: failing to place material orders; overpricing and underpricing materials; delayed product delivery; ignorance; lack of knowledge; lack of the JIT strategy, which is a useful method for success; poor planning; poor communication flow; strained supplier relationships; and insufficient funding (Yin & Ponnan, 2016). For operations to run smoothly and activities to be carried out continuously, an organization needs enough materials, and the goods and services must adhere to the necessary standards. From the delivery stage through storage and, finally, issuance, these processes enable an efficient flow of products (Jermsittiparsert, Namdej, and Somjai, 2019). Prior to being delivered and invoiced, every product that has been purchased should be checked. Electronic material management makes this process easier to understand.

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According to the research conducted by Maggioni, Giliberti, and Panunzio (2021), the

adoption of electronic material management practices contributes to the improvement of other aspects of the organization related to products such as production process scheduling, bill of material fastening, and inventory level maintenance via Material Requirement Planning (MRP) and (MRP11). Manufacturing capacity and the advantages of MRP are integrated through manufacturing resource planning (MRPII). By installing coding software, the procurement head assigned to the warehouse can track electronic products. This software counts products in the warehouse by assigning numbers, and it also helps warehouse staff identify products that aren't available for purchase (Ancheta, 2017).

It lowers the cost of ordering and holding goods by ensuring that they are stocked to order. A number of factors can make material management practices less effective. Yin and Ponnan (2016) list a few of these: not placing material orders; paying too much or too little for materials; delayed product delivery; ignorance; not implementing the JIT strategy, which is a helpful approach to success; inadequate planning; poor communication flow; poor relationships with suppliers; and a lack of funding. The goal of electronic material management is to optimize the resources of the organization while delivering goods and services to its clientele. Kenya Power, which provides electricity to arid and semi-arid regions, has enhanced its customer service. They employ E-material management to guarantee each customer's timely delivery. Kenya Power will be able to determine what proportion of its customers use electricity.

Oteki and Sakwa (2020) carried out a study to assess the influence of electronic material management practice on supply chain performance. The study applied a mixed research design with a survey of 12 sugar processing firms with a population of 7,584 employees and a sample of 379 respondents drawn from management staff. Pearson’s correlation was

applied to determine the relationship between electronic material management practice and Supply chain performance and regression analysis to test hypothesis. The results of model reveals that electronic material management practice has a positive influence on supply chain performance.

2.2.3 Electronic invoicing and organization performance

Invoicing generally involves the process of creating and sending out invoices for work that has been completed. It is an itemized bill for goods sold or services provided, containing individual prices, the total charge, and the terms (Hernandez-Ortega, 2011). Electronic invoicing (e-invoicing) refers to the sending and receiving of invoices by electronic means. E-invoicing has been recognized as one of the most important sources of profitability increases in organizations (Brun, 2007). The e-invoice is a kind of information system service that gathers transaction information and transmits it through a network (Hernandez-Ortega, 2011). In this era of e-business, it plays a critical role in maintaining business information throughout the supply chain (Chang et al., 2013).

Electronic invoices have been adopted differently among the employees; however, mixed feelings are normal for any novelty. During the transition to the new systems a proper communication and demonstration of the added value in the eyes of the user is extremely important. Employees have recognized the benefits mainly in spending less time on each activity and reducing the number of errors due to manual input of data. Besides, e-invoicing significantly reduced administrative tasks. However, organizations should standardize internal rules for work or redefine their procedures. Particularly in smaller companies a desire to standardize processes is evident since the entrepreneur does not want to deal with

bureaucratic tasks, but to devote its time to his core business (Varga, 2015).

Electronic invoicing offers many benefits: significant cost reduction, process simplification, reduced payment time, greater security of data, as well as numerous environmental benefits. This is confirmed by enterprises and public authorities which already use it (Lian et al., 2014). They attempt to explain why individual corporations do not perform asset transformation themselves as a function of the transaction costs incurred in conducting such activities. As shown in transaction cost economics, the cost of the infrastructure is reduced per transaction when the volume of transactions increases (Chang et al., 2013)

Lagat (2016) looked into how buyer-seller relationships in the business-to-business market were affected by the adoption and application of technology (specifically, electronic data interchange and electronic invoicing). The study employed a qualitative methodology. The research focused on three case companies that were involved in a variety of industries, such as the manufacturing and marketing of textiles, the building of machinery and power plants, and the airline sector. The results of the study show that different aspects of business-to-business relationships are impacted differently by the use of electronic invoicing.

Governments worldwide recognize that businesses need to switch to electronic invoicing in order to minimize administrative costs (Poel, Marneffe, & Vanlaer, 2016). According to their analysis of the potential cost savings associated with e-invoicing, the total cost of invoicing for Belgian private sector companies in 2014 would drop from €3.47 billion (0.96% of GDP) to €1.46 billion (0.38% of GDP) if all invoices were sent digitally. A review of the obstacles and facilitators of electronic invoicing also revealed persistent, serious safety concerns, despite the fact that the majority of private sector businesses are aware of the potential

efficiency gains.

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In the recent past, many countries have employed internet to provide e-invoice services for all stakeholders. Compared with traditional paper invoices, the e-invoice can help businesses achieve paperless, transparent transactions. Many previous studies have paid attention to einvoice adoption. However, most of them are focused on the business/firm level (Hernandez- Ortega, 2011; Vrcek & Magdalenic, 2011).

Kilay, Simamora, and Putra (2022) looked at the effect of electronic payment and commerce services on the supply chain performance of Micro, Small, and Medium-Sized Enterprises (MSMEs) in Indonesia. Expert interviews and discussions, descriptive analysis of research

indicators, and multiple linear regression analysis were conducted on 164 MSMEs. The findings demonstrate that the performance of Indonesia's MSME supply chains is positively and significantly impacted by e-payment and e-commerce service variables.

Mwalukasa (2023) investigated the impact of The effect of commerce services and electronic payments on the performance of tour operator supply chains within Tanzania's tourism sector. A convergent parallel mixed-method design was used, with 543 tour operators as the sampling frame. A multi-stage sampling method was used to choose 230 respondents. A structured questionnaire that was self-administered and an interview guide were used to gather primary data. Descriptive statistics were used to generate percentages, mean responses, and cross-tabulations from quantitative data. To test hypotheses, IBM SPSS Amos version 20 was used, which employs inferential statistics and structural equation modeling. NVivo version 20 was used to conduct thematic analysis of qualitative data. The study found that electronic payments had a positive and significant impact on tour operators' supply chain performance.

Another study on electronic payments and the performance of the Nairobi County Government was carried out. The study employed both descriptive and explanatory designs. The study found that electronic payment practices have a positive and significant impact on performance (Gathima & Njoroge, 2018).

Yaokumah, and Kumah (2017) in their study looked at demographic influences on e-payment services. The study investigated customers' preferences of payment systems and the influence of demography on the attitude of customers towards e-payment services. The t-test and the analysis of variance were employed to examine the differences in perception of

security, ICT literacy, customer satisfaction, and the use of e-payment services based on customers' age, gender, and the level of education. The findings revealed no significant differences between the male and female customers in the use of e-payment services. Moreover, there were no significant differences in satisfaction and e-payment use, though, customers with higher level of education felt less secured using the services.

Sokobe (2015) studied on factors influencing adoption of electronic payment by Small and Medium Hotel Enterprises in Kisii Town, Kisii County, Kenya. The purpose of this study was to investigate on the factors that influence adoption electronic payment among the hotel SMEs, Kisii town, Kenya. A Survey design was conducted. Data on entrepreneurial characteristics, costs and ease of use was obtained and analyzed for descriptive statistics. The findings of the study confirmed that entrepreneur background characteristics in measured in terms of education levels, age and skills influenced electronic payments highly. Similarly, and ease of use of electronic gadgets in terms of speed, convenience and storage influenced adoption of electronic payments highly. On the basis of the findings it was concluded that entrepreneur background characteristic sand ease of use of electronic gadgets are the main factors that influence adoption of electron payments.

Kiley et al. (2022) studied on the Influence of E-Payment and E-Commerce Services on Supply Chain Performance: Implications of Open Innovation and Solutions for the Digitalization of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The study measured the influence of the use of e-payment and e-commerce services on MSME supply chain performance, as well as suggesting open innovations and solutions to accelerate the digitization of MSMEs. multiple linear regression analysis, descriptive analysis of research indicators, and interviews and discussions with research experts. he results demonstrate that

there exists a positive and significant influence of both e-payment and e-commerce service variables on the performance of MSME supply chains in Indonesia.

2.3 Theoretical Review

This study was anchored on various theories including Value chain theory

2.3.1 Value Chain Theory

Michael Porter first proposed this theory in 1985. The process or activity through which a business adds value to a product, such as in production, marketing, and after-sale services, is referred to as the value chain by Benito, Petersen, and Welch (2019). The goal of adding value to a product is to make it more appealing to the final consumer and give it a competitive edge. Value is a strategic business tool that planners use to find areas where their company has a competitive advantage. It follows the influence on the product from the beginning to the point of delivery to the customer.

A business's value chain is the collection of actions it takes to accomplish its main objective, which is to maximize profits. The activities are separated into two categories: primary activities, which directly support the creation of value. Operations, sales, marketing, and both inbound and outbound logistics fall under this category. Arriving Functions such as infrastructure, technology, procurement, and human resources are supported by secondary activities. His communication of cost leadership and differentiation strategies contributes to the long-term goal's accomplishment.

Supply chain management can be improved by using value chains. Electronic data interchange, online tendering, ERP, and electronic ordering systems are examples of information sharing tools that have been made possible by technological advancements and

the internet. Positive relationships with suppliers, customers, and other relevant parties are present in these tools, along with a supported link. Culture differences, inadequate information technology, and misaligned processes have all hampered the progress of supply chain integration between the intended party and the firm.

Wang, Qu, and Mileski (2018) state that companies that use total quality management, re-engineering techniques, and efficient production will be able to cut costs without sacrificing the quality of their goods and services or flexibility. Putting a value chain into practice gives you a competitive edge. Because of their success, managers now think that supply chain efficiencies could lead to further advancements. The Porter value chain expands the supply chain's application to include intercompany data. Starting point for the raw materials and end product. According to Zhang (2020), the foundation of cross-value strategy is the idea of managing the value chain to gain a competitive advantage. This theory was relevant for the study because it gives a basis in understanding supply chain.

2.3.2 Technology Acceptance Model

There has been an increase in procurement cost and companies are seeking to adjust their budgets accordingly. Organizations are facing serious pressure of providing quality products and services despite resource limitation. Information and communication technologies have been adopted by many organizations both public and private organizations which has led to increased performance through effective communication, knowledge sharing, information access and innovation (Dewett& Jones, 2001).

The processes that influence and shape users' acceptance of new information technology are explained by Davis (1993) in his creation and validation of the Model of Acceptance of

Technology (TAM). Two particular variables that, according to TAM, relate to new information system design features are perceived usefulness and perceived ease of use. significantly influence users' attitudes toward and actual use of information technology.

According to Hu et al. (1999), ease of use is the user's perception that the benefits of the system outweigh the effort required, while usefulness is the degree to which a person believes that using a system will improve his performance. The organization's current system may need to be reengineered in order to implement ICT, which will ultimately change how tasks are completed (Kaliannan et al., 2008).

When a company adopts E-Procurement, major tasks that are performed therein can change significantly. One such task is the ordering process, which includes preparation, approval, and transmission of orders to suppliers. Successful implementation of electronic procurement requires a well-designed policy and process. One of the important variables which may derail successful implementation of e-procurement is users' acceptance of new information technology. Implementation of electronic procurement may face resistance because it represents a change in the way they perform their procurement activities. The changes include replacement of the traditional manual procures with procedures anchored on information and communication technology. The theory was also seen to be relevant seen electronic procurement has to do with technology connections.

2.3.3 Innovation Diffusion Theory

In 1962, Rogers proposed the innovation theory, which explains innovation as a process that enhances economic development (Ho, 2021). The process of embracing and implementing innovation within a company is referred to as diffusion. This theory is relevant to eighteen

studies because it describes how technology has transformed the way that goods, services, and consultants are acquired. Rather than using manual processes, digital methods—such as electronic ordering, payment, and tendering—are preferred. O.E.C.D. 1997 quoted Al-Rahmi et al. (2019) to further clarify innovation as the process of gaining new knowledge and skills in an efficient and profitable manner, which is necessary for creating and implementing new markets as well as upgrading products.

To improve daily operations, the diffusion of innovation philosophy necessitates the evolution and revolution of machines, humans, and products. Four components make up diffusion: the social system, time innovation, communication channel, and EL-Masry and Agag (2016). The four qualities that characterize innovation theory are as follows: observability, relative advantage, trial ability, complexity, and compatibility.

Diffusion theory is applied based on an individual's ease of perception and experience with innovation. These characters have the ability to comprehend technology better and use it more readily. As stated by Tiwari, Marak, and Tiwari (2019). The advancement of technology has resulted in better purchasing practices. Paper transactions have given way to electronic processing systems, which are quicker, safer, and more secure. This has also improved the performance of procurement functions, enabling the fulfillment of procurement principles such as accountability, fair competition, and transparency. This theory supports the organization's adoption of new concepts and technological advancements while launching new policies and procedures, particularly in the procurement division. This theory was of relevance because the application of e-procurement is as a result of innovation.

2.3.4 Resource Based View Theory

In a 1991 study on heterogeneous firms, Barney and Wemer developed resource-based theory (RBVT), which highlighted the similarities between entry and resource barriers (Mweru & Maina, 2016). According to this theory, resources are a crucial component of organizational growth and development; without sufficient resources, organizational development will be pointless or ineffectual. Resources are divided into three categories, according to theory: organizational, human, and physical capital resources. Appropriate and efficient resource allocation aids in the company's goal-achieving and performance-enhancing activities.

Supply chain integration refers to the cooperation of various parties within an organization that facilitates efficient communication. A supplier is crucial to the company's supply of necessary resources and to the uninterrupted flow of goods within an establishment. According to Dyer Davis and DeWitt (2021), inter-organizational resources are crucial because they help firms perform better than those with limited resources. To attain improved performance, internal and external resources are combined. The theory was relevant for this study because electronic procurement is concerned with acquisition of resources.

2.4 Conceptual framework

A conceptual framework is the diagrammatic presentation of variables, showing the relationship between the independent variable and the dependent variables (Mugenda & Mugenda, 2003). The conceptual framework here under illustrates the perceived link between the independent (electronic procurement variables) and dependent variable (organization performance). The conceptual framework is founded from the literature review, which depicts a linkage between electronic procurement and organization

performance. The direction of the relationship between the independent and dependent variables is shown in the conceptual framework that follows. The electronic invoicing, electronic materials management, and electronic tendering are the independent variable components. On the other hand, the performance of the organization is the dependent variable component. The different measures for each component are also indicated.

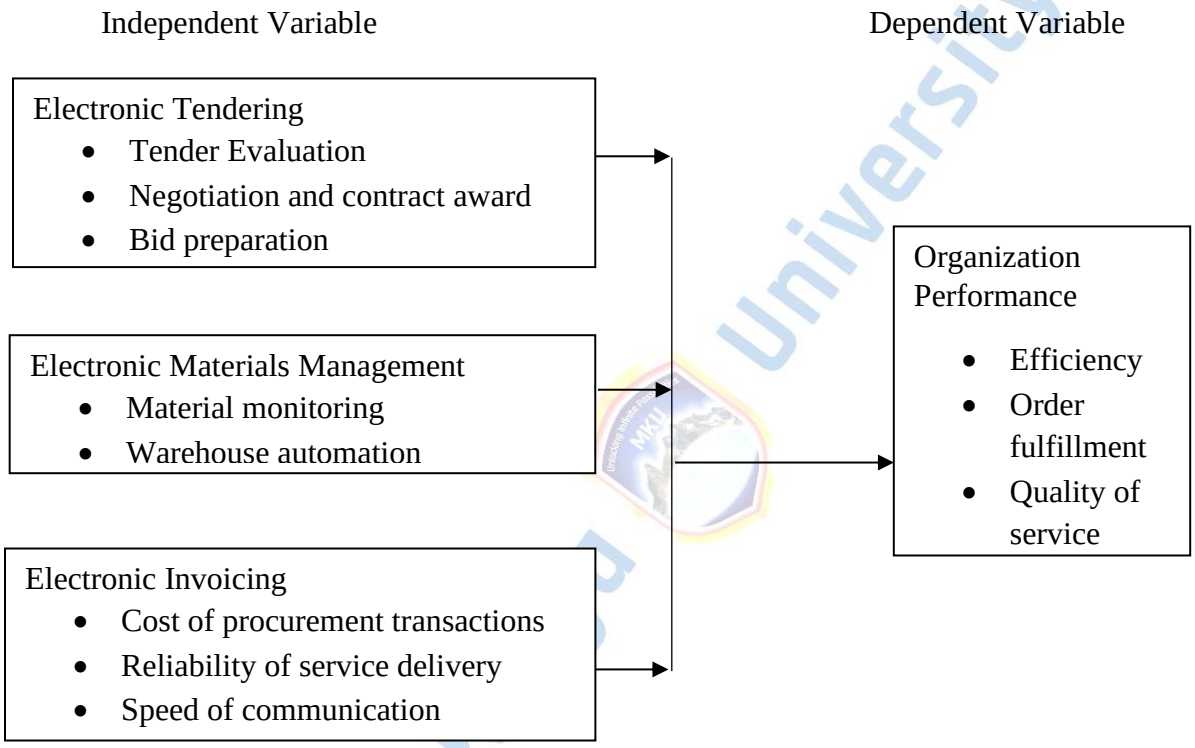

Figure 1: Conceptual Framework

Source: Researcher (2024)

The conceptual model in figure 1 shows the relationship between three variables under study, electronic tendering, electronic materials management, and electronic invoicing. Electronic tendering is constituted as tender evaluation, negotiation and contract award as well as bid preparation. Electronic materials management is conceptualized as material monitoring, and warehouse automation. Electronic invoicing has been conceptualized in terms of cost of

procurement transactions, reliability of service delivery, and speed of communication. Organization performance is conceptualized as efficiency, order fulfillment, and quality if service.

2.5 Recap of Literature Review

Numerous studies have been conducted on electronic procurement, including one by Kamotho (2014) that looked into the effectiveness of state-owned companies in Kenya's purchasing procedures. The study's conclusions showed that electronic invoicing and tendering have significantly improved performance. Gathima and Njoroge (2018) investigated how the Nairobi County Government performed in relation to e-tendering. The study was directed by the theories of transaction costs and innovation diffusion. In order to maintain the quality of its operations, the study suggested that Nairobi City County give careful consideration to adopting and putting into practice various e-tendering featuresAccording to Maggioni, Giliberti, and Panunzio (2021), the use of electronic material management techniques helps organizations improve other areas that are applicable to products, such as production process scheduling, bill of material fastening, and inventory level maintenance using Material Requirement Planning (MRP) and (MRP11). All the studies done have shown that electronic procurement plays a bigger role in the performance of organization. The findings necessitated the desire for the current study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section included details on the methodology that were employed, such as the design, study population, sample size and technique, types and sources of data, data analysis method, and ethical considerations. Moreover, the research's validity and reliability were made clear.

3.2 Research Design

This study employed a descriptive research design to examine the impact of electronic procurement on an organization's performance. Using descriptive and inferential statistics, descriptive design enables the collection and quantitative evaluation of data (Saunders et al., 2009).

3.3. Location of the study

The study was carried out in Nairobi and specifically at Energy and Petroleum Regulatory Authority offices in Upper-hill, Nairobi. The choice of the location was because the organization is purely concerned with procurement and supply as the main activity. The selection of Nairobi is because it hosts the head office and it is where all decisions are made.

3.4 Target Population

The larger group from which a sample is drawn is known as the target population. It includes everything and everyone who possesses certain qualities (Mugenda & Mugenda, 2003). The study was conducted at EPRA, Nairobi representing the target population. EPRA has 157 staffs in which seven are senior level, ten are middle level, one hundred and forty are lower level (EPRA, HR department, 2022). This is distributed as shown.

Table 1: Target Population

Category	Population
Senior Level	7
Middle Level	22
Lower Level	128
Total	**157**

Source: Researcher,2024

3.5 Sampling Procedure and Technique

Stratified sampling was employed for this study to ensure accuracy of the results. The employees at each level were considered as strata's. Each stratum was then given the same sampling fraction. Finally, simple random sample was used to select respondents at each level of management (strata). Mugenda & Mugenda (2003) says that 10% to 30%of the population is acceptable as a sample size to be used for generalization. Based on this statement, a sample size of 96 employees was regarded as adequate for this study. Their distribution is as shown;

Table 2: Sample Size Distribution

Category	Population	Sample size
Directories Heads	7	4
Managers	22	14
Officers and office assistant	128	78
Total	**157**	**96**

Source: Researcher, 2024

3.6. Construction of research instruments

Both closed-ended questions were included in the study's questionnaire to encourage respondents to express their opinions and make sure their answers are relevant to the investigation's objective. Structured questionnaire had four sections, namely, sections on demographic information, e-tendering on organization performance, e-materials management practice on organization performance, and e-invoicing on organization performance.

3.7 Data Collection and Instruments

Primary data was used in this study to gather information. All information gathered by the researcher directly from sources such as surveys, observations, experiments, questionnaires, focus groups, and interviews is referred to as primary data (Rabianski, 2003).

3.8 Testing for Validity and Reliability

3.8.1 Validity

According to Born and Gall (1999), whether an instrument measures what it is supposed to measure is referred to as validity. To determine whether the instruments provided answers to the research questions, the researcher employed content validity. Modifications and enhancements to the research tools consultations. There were conversations with the supervisor to determine the content validity.

3.8.2 Reliability

Reliability in research describes the extent by which an instrument of research is able to show results or data that is consistent after repeated trials (Blanche et al., 2006). The degree to

which a research tool consistently yields the same results over time is known as its reliability. To validate it, several measurements are taken on the same subjects. Reliability in this study was examined for internal consistency using the Cronbach alpha coefficient. Cronbach alpha (α) that is used to rate the internal consistency. Acceptable alpha should be at least 0.70 or above. The researcher first ensured that appropriate data sources are chosen. A pilot study was carried out on personnel from the domestic taxes department where ten questionnaires were issued out to them.

According Hazzi and Maldaon, (2015), performing a pilot study is important to make sure the tools used to get information are dependable. Dependability on instrument is trusted if it measures what it was supposed to and is truthful. A Pilot study is done to identify any weakness in design of the instrument and to get relevant information that can be used in choosing the sample. Results are presented in table 3.

Table 3: Pilot test results

Element of Variable	**Alpha Value**
Electronic Tendering	0.821
Electronic Materials Management	0.782
Electronic Invoicing	0.744
Organization Performance	0.756

Source, Researcher (2024)

Basing on the findings on table 3 above it is observed that Cronbach Alpha values for electronic tendering, electronic materials management, electronic invoicing, and

organization performance were all more than 0.7 which approves that the variables were reliable for this study.

The researcher was also concerned with checking if the questionnaires were good and well-structured by using construct validity method. According to Muganda (2018), construct validity is concerned with the extent to which a test captures the intended outcome. One way of checking how good a test can be being to ask people that know a more about it. These experts can look at the questions and decide what they are trying to find out. Experts were asked to check out the instrument and give suggestions on how to make sure it really works well. These recommendations were then being integrated into the new version of the instrument which was given to a few people in similar jobs. These pilot group was asked how easy it was for them to respond to the test questions. Any relevant comment was added to the final version the instruments. the pilot study, the instrument's dependability was evaluated.

3.9 Data Collection methods and procedures

The researcher first applied for a research permit from the university department offices in order to help obtain authorization to collect data. Furthermore, a letter from NACOSTI looked for. Research assistants who had received training were used in this study to help distribute the questionnaires. Questionnaires was used in collecting of primary data. This is due to the fact that data was gathered by the researcher specifically for this investigation. The questionnaires were designed to be self-administered in order to minimize interviewer bias, and they were distributed using the drop and pick method.

3.10 Data analysis techniques and procedure

The information gathered from the surveys was edited and cleaned up first, then coded and sent for additional examination. To determine a score on a scale of 1 to 5 based on the measurement's magnitude, the Likert scales in the closed-ended questionnaire questions was converted to numerical codes. The Statistical Package for Social Sciences, or SPSS, version 21.0 computer program was then applied. In a descriptive statistical analysis, the essential characteristics of the data was characterized by frequencies and percentages. Regression statistics and Pearson's Product-Moment Correlation Coefficient was used in the inferential data analysis. Correlation analyses was used to quantify the relationship between the variables. This was significant because it allowed the analysis's findings to be applied to a wider demographic. The following regression models were used to direct the investigation.

$Y = a + \beta_1 X_1 + \epsilon$

$Y = a + \beta_2 X_2 + \epsilon$

$Y = a + \beta_3 X_3 + \epsilon$

Where:

Y = Organization performance

X_1= E-tendering

X_2= E-materials management

X_3= E-invoicing

a = y- intercept

ϵ = error term

β_1 to β_3 = strength of connection among variable.

3.11 Ethical Considerations

Prior to the start of the data collection process, authority from Mount Kenya University and authority from the research regulatory body NACOSTI were pursued. Before the study was conducted, the voluntary participation of the respondents that were sampled was explained. The researcher made sure that no action was taken that could endanger the respondents' physical or emotional health. This was ensured by crafting the questionnaire's sensitive or challenging questions. Privacy and confidentiality were taken into account by making sure the data collected from respondents was used exclusively for academic purposes.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter is about the outcomes of the study on the impact of electronic procurement practices on organizational performance in in the energy sector, a case of energy and petroleum regulatory authority, Kenya. It begins with a presentation of response rate and study sample features. The chapter also talks about descriptive statistics in detail. The study joins the findings with previous studies so that the information could be understood, conclusions made and advice could be given inform of recommendations.

4.2 Response Rate

From the questionnaires that were distributed to them, the study aimed to ascertain the response rate. Table 4 presents the findings.

Table 4: Response Rate

	Senior level		Middle level		Lower level	
Response rate	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Respondent	4	100.0	11	78.6	71	91.0
Non-respondent	0	0.0	3	21.4	7	9.0
Total	**4**	**100**	**14**	**100**	**78**	**100**

Source, Researcher (2024)

The sample population of this study was 4 employees at senior management level, 14 employees at middle management level and 78 employees at lower management level of the Energy and Petroleum Regulatory Authority, Nairobi. A total of 96 questionnaires were issued to employees of which 86 employees answered the questionnaires fully and they were collected back. This response represented 100% for senior level, 78.6% for middle level and 91.0% for lower level This response rate was satisfactory and in line to Mugenda and Mugenda (2003) which states that when at least 60% of people respond, it is good for analysis and reporting.

4.4 Demographic Information

This section enlightens about the respondents who answered the questionnaires, based in different groupings categorized in terms of the; gender, level of education, as well as duration of employment in the organization. Table 5 indicates the results.

Table 5: Demographic Information

	senior management		**Middle management**		**Lower management**	
Item	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Gender						
Male	3	75.0	9	64.3	51	65.4
Female	1	25.0	5	35.7	27	34.6
Total	**4**	**100**	**14**	**100**	**78**	**100**
Level of						

Education						
Primary	0	0.0	0	0.0	0	0.0
Secondary	0	0.0	2	14.3	20	25.6
Tertiary	2	50.0	5	35.7	31	39.7
University	2	50.0	7	50.0	27	34.6
Total	**4**	**100**	**14**	**100**	**78**	**100**
Duration of Employment						
Below 5Years	1	25.0	3	21.4	18	23.1
5-10Years	1	25.0	6	42.9	31	39.7
Over 10Years	2	50.0	5	35.7	29	37.2
Total	**4**	**100**	**14**	**100**	**78**	**100**

Source, Researcher, (2024

Findings as presented in table 5 shows that majority of employees at Energy and Petroleum Regulatory Authority are men at 3(75%), 9(64.3%), and 51(65.4%) for senior level of management, middle level of management and lower level of management respectively. The result of table 5 also informs that with regards to the level of education, those with University qualification are 2(50.0%), 7(50.0%), and 27(34.6%) for senior, middle and lower levels of management respectively. For those with tertiary qualification are represented by 2(50.0%), 5(35.7%), 31(39.7%) respectively for senior, middle and lower management levels in that order. In addition, those with secondary qualifications represents 0(00.0%), 2(14.3%), and 20(25.6%) correspondingly for senior, middle and lower levels of management. Likewise,

those with primary qualifications represents 0(00.0%) at all the three levels. This finding indicate that employees of EPRA have relevant education qualifications required as managers of the different positions.

In table 5 there is also results showing the period of years that the employees have been working at EPRA. Those who have been with the company for more than ten years are 2(50.0%), 5(35.7%), and 29(37.2%) of the employees for senior, middle and lower levels of management correspondingly. five to ten years' duration are 1(25.0%), 6(42.9%), and 31(39.7%) in the ranks of senior level, middle level and lower level management in that respect. below Five year working duration are 1(25.0%), 3(21.4%), and 18(23.1%) correspondingly for senior, middle and lower levels of management. The findings inform that Energy and Petroleum Regulatory Authority are able to maintain its work force for longer time hence cost of replacing the employees that might have left and that majority at higher management levels are those who have been working for some time with the organization.

4.5 Descriptive Statistics

The descriptive findings and the discussions on organization performance have been explained in this section. Standard deviation, mean, and percentages have been used to present the results.

4.5.1 Descriptive statistics on electronic tendering

In the first objective of the study, the researcher's intention was to assess the influence of electronic sourcing on supply chain performance at Kenya Revenues Authority. The response was ranked in a scale of 1 to 5, with 1 denoting a strong disagreement, 2 indicating

disagreement, 3 indicating neutral, 4 suggesting agreement, and 5 denoting a total agreement. Using percentages mean and standard deviation of descriptive statistics, these results were assembled and are presented in table 6.

Table 6: Responses to electronic tendering

Opinion	**SD %**	**D %**	**U %**	**A %**	**SA %**	**M**	**Std Dev**
The organization can increase transparency through the use of electronic tendering..	7.6	10.1	12.3	40.6	29.4	3.68	1.14
Supply chain performance is improved by using electronic tendering since it lowers expenses related to traditional tendering.	2.7	7.3	9.6	48.3	32.1	3.27	1.07
Electronic tenders speed up the entire process, which enhances the company's supply chain performance.	2.4	5.3	7.9	46.8	37.6	3.19	1.12
Using electronic tendering aids in standardizing the purchasing procedure across the company's supply chain management.	6.8	7.3	4.4	45.1	36.4	3.15	1.09
When using the company's e-tendering system for supply chain management, there is less room for human error.	3.8	7.2	9.2	41.2	38.6	3.22	1.13

Source: Researcher, (2024)

Key: n = 96, SD is strong disagreement, D is disagreement, N is neutral, A is agreement, SA is strong agreement, M is mean, Std. Dev is standard deviation.

Table 6 results show that all items had a standard deviation of more than 1.0. The statement "The organization can increase transparency through the use of electronic tendering" had the highest standard deviation of 1.14. In the statement "The organization can increase transparency through the use of electronic tendering", the figure shows that a small number of people strongly disagreed or disagreed at 7.6% and 10.1% respectively while a large number of people agreed or strongly agreed at 40.6 % and 29.4 % respectively, this shows that, there was no extreme in the item, it makes a good measure. For the statement, "Supply chain performance is improved by using electronic tendering since it lowers expenses related to traditional tendering" 2.7% and 7.3% strongly disagreed or disagreed in that respect while 48.3% and 32.1% agreed or strongly disagreed with the statement. The statement "Electronic tenders speed up the entire process, which enhances the company's supply chain performance" with had a variability of 1.12 which gives extremes. The result show that 2.4% strongly disagreed with the statement and a slightly bigger percentage 5.3% disagreed. However, a bigger percentage at 46.8% agreed with the statement while 37.6% strongly agreed. Therefore, it can be stated from the result that indeed, Electronic tenders speed up the entire process, which enhances the company's supply chain performance. Additionally, result shows that majority of respondents at 45.1% and 36.4% supported the statement that Using electronic tendering aids in standardizing the purchasing procedure across the company's supply chain management with only 7.3% and 6.8% expressing their disagreements. Moreover, 41.2% and 38.6% agreed to and strongly agreed to the statement that When using the company's e-tendering system for supply chain management, there is

less room for human error with only 7.2% and 3.8% disagreeing with the statement.

Moreover, the highest mean value was 3.68 and the lowest mean was 3.15. This informs that on average, respondents all had a positive position which is over 3.0. This establishes that, on the whole, the respondents showed optimism with the statements. These findings are validated by the scores from this section which informs that employees at energy and petroleum regulatory authority are in agreement that electronic tendering is a significant aspect in organization performance which will ensure improved organization improvement.

The findings are in support of the study done by Sharifai, Mbaraka and Agaba (2013) who had conducted a study on the effects of e-procurement and performance of service organizations in Uganda. The findings had indicated that there was a connection between electronic procurement and the performance of the service organizations that were selected. Additionally, the finding is in support of a study carried out by Kamotho (2014) looked into Kenyan state corporations' E-Procurement and procurement performance. The study's conclusions showed that electronic invoicing and tendering have significantly improved performance.

4.5.2 Descriptive statistics on electronic Material Management Practices

The second objective of the study was to assess the effect of electronic materials management practices on organization performance at Energy and Petroleum Regulatory Authority. Ranking of respondents was in a scale of 1 to 5. Percentage, mean and standard deviation of descriptive statistics were used to summarize the response results. Findings are presented in table 7.

Table 7: Responses to electronic Material Management Practices

Opinion	SD %	D %	N %	A %	SA %	M	S Dev.
By using electronic Material Management techniques, the company's stock levels are improved	5.1	5.9	4.4	43.4	41.2	3.18	1.16
By using electronic material management to make sure there isn't a lot of excess inventory and that the products supplied meet customer demands, the business can lower capital expenses.	3.0	6.1	4.2	44.6	40.1	3.13	1.13
Electronic material management techniques reduce redundant material handling in the supply chain operations of the business.	4.7	6.5	6.2	41.4	41.2	3.15	1.14
Electronic material management practices enable the organization to facilitate the	3.2	7.8	5.8	39.8	43.4	3.22	1.09

proper type and quantities

acquired initially.

Source, Researcher (2024)

Key: n = 96, SD= strongly disagree, D =disagree, N = neutral, A = agree, SA = strongly agree, M = mean, Std. Dev = standard deviation

Table 7 shows that all the four items under consideration had standard deviations that were more than 1.0, informing that the items had accurate measures without extremes. The statement "By using electronic Material Management techniques, the company's stock levels are improved" had a variability of 1.16 which shows no extremes. The number shows that very few respondents strongly disagreed at 5.1% or disagreed at 5.9%, though a big number of the respondents either agreed at 43.4% or strongly agreed at 41.2%. The item "By using electronic material management to make sure there isn't a lot of excess inventory and that the products supplied meet customer demands, the business can lower capital expenses" had a standard deviation of 1.13. This tells that most of the respondents had similar opinions (strongly agree and agree) about the statement as being good measures. Results show that 44.6% and 40.1% either agreed or strongly agreed with the statement, with only 3.0% and 6.1% strongly disagreeing or disagreeing respectively with the same statement. On whether Electronic material management techniques reduce redundant material handling in the supply chain operations of the business, 41.4% and 41.2% of the respondents agreed or strongly agreed to the statement while 6.5% and 4.7% disagreed or strongly disagreed to the statement. Considering whether Electronic material management practices enable the organization to facilitate the proper type and quantities acquired initially, result shows that most of the respondents had similar opinions at 1.09 standard deviation about the statement

as being good measures. Results informs that 39.8% and 43.4% either agreed or strongly agreed that indeed Electronic material management practices enable the organization to facilitate the proper type and quantities acquired initially, with only 3.2% and 7.8% strongly disagreeing or disagreeing respectively with the same statement.

The mean was 3.22 at its highest and 3.13 at its lowest. The findings showed that respondents took a more positive stance of more than 3.0. This indicates that the majority of respondents to the survey agreed with the statements. The majority of employees at the energy and petroleum regulatory authority concurred that electronic materials management practices was significant to performance of organizations in regards to organization performance.

The findings are in support of the study done by Ancheta (2017) who observed that effective electronic material management can lead to a number of benefits, such as improved data accuracy, better quality and quantity, shorter lead times, simpler operations, better delivery performance, lower costs, higher productivity, lower inventory costs, and easier accountability and transparency. The study findings also support the one by Maggioni, Giliberti, and Panunzio (2021) on the implementation of electronic material management practices which facilitates the enhancement of other product-related aspects within the organization.

4.5.3 Descriptive statistics on electronic invoicing

The third objective was to evaluate the impact of electronic invoicing on organization performance at the energy sector in Kenya. The response was ranked from 1 to 5 with 1 denoting "Strongly Disagree," 2 "Disagree," 3 "Neutral," 4 "Agree," and 5 "Strongly Agree." The mean and standard deviation of descriptive statistics were used to summarize the response. Results are presented in table 8.

Table 8: Responses on electronic invoicing

Opinion Statements	SD %	D %	N %	A %	SA %	M	Std.Dev.
The cost of procurement transaction is reduced through electronic invoicing.	7.8	8.4	5.3	43.1	35.4	3.22	1.18
Electronic invoicing can make great improvements on transportation and logistics in the company	5.9	7.7	4.2	44.4	37.8	3.16	1.11
With electronic invoicing, the organization is able to speed communication with regards to procurement	3.2	5.1	4.2	49.6	37.9	3.31	1.16
Electronic invoicing reliability of service delivery thereby ensuring improved organization performance	6.8	14.3	6.3	44.4	39.2	3.27	1.14

Source, Researcher, (2024)

Key: n= 96, SD= strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, Std. Dev =standard deviation

Table 8's findings show that the items' highest standard deviation was 1.18 while the lowest was 1.11. From the outcome, 43.1% and 35.4% of respondents agreed and strongly agreed respectively with the statement "The cost of procurement transaction is reduced through electronic invoicing" whereas 8.4% and 7.8% disagreed and strongly disagreed with the statement. This indicates that indeed cost of procurement has a role in supporting organization performance within the organization. Besides, with regards to the statement "Electronic invoicing can make great improvements on transportation and logistics in the company" 5.9% and 7,7% of the respondents did not support the statement by strongly disagreeing and disagreeing respectively while 44.4% and 37.8% agreed and strongly agreed respectively. This informs the study that Electronic invoicing can make great improvements on transportation and logistics in the company. Further, 3.2% strongly disagreed and 5.1% disagreed to the statement "With electronic invoicing, the organization is able to speed communication with regards to procurement" respectively, though 49.6% and 37.9% indicated agreement and strong agreement in supporting the statement. A big number of respondents at 83.6%, supported the statement that "Electronic invoicing reliability of service delivery thereby ensuring improved organization performance" with 21.1% not in support of the statement. This demonstrates that the respondents had a positive attitude above 3.0. This demonstrates that the respondents' overall attitude was one of agreement. with the statements. In overall, descriptive results regarding the effect of electronic invoicing on organization performance shows that it is a positive and significant.

The findings are in line with that of Lian et al., (2014) who stated that electronic invoicing

offers many benefits including significant cost reduction, process simplification, reduced payment time, greater security of data, as well as numerous environmental benefits. The study is also in line with that of Chepkwony and Lagat (2016) who looked into how buyer-seller relationships in the business-to-business market were affected by the adoption and application of technology, specifically, electronic data interchange and electronic invoicing and results of the study show that different aspects of business-to-business relationships are impacted differently by the use of electronic invoicing. In addition, the findings are in support to that by Yaokumah, and Kumah (2017) who looked at demographic influences on e-payment services and their findings revealed no significant differences between the male and female customers in the use of e-payment services. Moreover, there were no significant differences in satisfaction and e-payment use, though, customers with higher level of education felt less secured using the services.

4.5.4 Descriptive statistics on organization performance

During descriptive analysis, the researcher also looked at organization performance in relation to energy and petroleum regulatory authority. Ranking of responses was from 1 to5, with 1 denoting "strongly disagree," 2 denoting "disagree," 3 denoting "undecided," 4 denoting "agree," and 5 denoting "strongly agree." The mean and standard deviation of descriptive statistics were used to summarize the response. The outcome was presented in table 9.

Table 9: Responses on organization performance

Opinion Statements	**SD**	**D**	**N**	**A**	**SA**	**M**	**Std. Dev**
	%	**%**	**%**	**%**	**%**		
Regarding procurement, there is a greater adherence to protocols and guidelines.	5.2	7.7	6.4	42.1	38.6	3.16	1.15
We are generating goods and services of higher caliber	6.4	8.3	6.2	41.6	37.5	3.27	1.13
Planning for procurement has greatly improved.	5.5	7.6	5.7	45.7	35.5	3.15	1.18
Better benchmarks for procurement have been established.	2.1	4.4	3.2	47.4	52.9	3.16	1.13
Procurement integrity and transparency have been improved.	5.4	8.5	4.6	43.2	38.3	3.07	1.14
In general, the performance has improved.	6.3	7.5	6.7	41.9	37.6	3.12	1.09

Source, Researcher (2024)

Key: n= 96, SD= strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, Std. Dev. =standard deviation

The outcome in table 9 reveals that all four items had standard deviations that was more than 1.0. The items' maximum standard deviation was 1.18, indicating that the scoring had

no extremes. 5.2% and 7.7% of respondents gave strongly disagree and disagree answers to the item, “Regarding procurement, there is a greater adherence to protocols and guidelines” respectively, while 42.1% and 38.6% indicated agree and strongly agree responses to the statement. The substantial standard deviation observed indicates that the respondents were skewed towards the positive than the negative. 8.3% and 6.4% of the respondents disagreed and strongly disagreed with the statement “We are generating goods and services of higher caliber” with 41.6% and 37.5% either agreeing or strongly agreeing to the same statement. Moreover, as per the statement “Planning for procurement has greatly improved”, 5.5% and 7.6% strongly disagreed and disagreed respectively though 45.7% and 35.5% agreed and strongly agreed respectively with the statement. In regards to the statement “Better benchmarks for procurement have been established”, 2.1% and 4.4% strongly disagreed and disagreed respectively with the statement, with 47.4% and 42.9% agreeing and strongly agreeing to the statement. Furthermore, as to whether Procurement integrity and transparency have been improved, 5.4% and 8.5% strongly disagreed and disagreed respectively to the statement though 43.2% and 38.3% of the respondents agreed to and strongly agreed to the statement. Finally, in regards to whether In general, the performance has improved, result informs that 41.9% and 37.6% agreed and strongly agreed by supporting it while 7.5% and 6.3% expressed lack of support to the statement by disagreeing and strongly disagreeing in that order.

The mean range was from 3.07 to 3.27, with 3.27 being the highest mean. The means of all five items were higher than 3.0. This demonstrates that the respondents adopted a neutral stance of above 3.0. The respondents were viewed as impartial with regard to organization performance in general.

4.6 Correlation Analysis regarding study variables

The study used the Pearson correlation coefficient (r) to examine the strength of the relationship between the variables. The correlations matrix in table 9 provides an illustration of the relationship between the variables.

Table 10: Correlation Matrix of the Variables under Study

Variable		OP	ET	EMM	EI
OP	Pearson Correlation	1			
	Sig.(2tailed)				
ET	Pearson Correlation	.571*	1		
	Sig.(2-tailed)	0.001			
EMM	Pearson Correlation	.547*	.423*	1	
	Sig.(2-tailed)	0.001	0.001		
EI	Pearson Correlation	.526*	.411*	.311*	1*
	N	96	96	96	96

Source, Researcher (2024)

Key: OP=Organization Performance, Et=Electronic Tendering, EMM=Electronic Materials Management Practices, EI=Electronic Invoicing.

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

Results from table 9 indicate that relationship between electronic tendering and organization performance was significant and positively correlated r (ET, OP) = 0.571, p<0. 001.This

means that any positive adjustment in electronic tendering will lead to increased performance at Kenya Revenue Authority. The findings of the study are in line with those of Kamotho (2014) who conducted a study to determine how electronic tendering and performance of Nairobi County Government. Their findings revealed that electronic tendering is significant in improving organization.

In addition, electronic materials management was found to have a positive and significant correlation with supply chain performance r (EMM, OP) = 0.547, p <0.001. Findings of the current study are in support of that carried out by Maggioni, Giliberti, and Panunzio (2021) who had looked at the effect of electronic materials management on the organization performance and found out that implementation of electronic material management practices facilitates the enhancement of other product-related aspects within the organization, such as production process scheduling, bill of material fastening, and inventory level maintenance via Material Requirement Planning (MRP) and (MRP11). Current study also aligns to that by Jermsittiparsert, Namdej, and Somjai, (2019) who states that from the delivery stage through storage and, finally, issuance, these processes enable an efficient flow of products. Finally, the findings of the study go hand in hand with those of Gathima and Njoroge who were looking at effect of electronic payments and the performance of the Nairobi County Government which revealed the existence of a positive and significant effect on performance. Furthermore, electronic invoicing at r (EI, OP) =0.526, p<0.001, was likewise revealed to be positively and significantly correlated with organization performance. These results are comparable to those of Chepkwony and Lagat (2016) looked into how buyer-seller relationships in the business-to-business market were affected by the adoption and application of technology (specifically, electronic data interchange and electronic invoicing).

The results of the study show that different aspects of business-to-business relationships are impacted differently by the use of electronic invoicing.

4.7 Regression Analysis

Regression analysis was done to establish the relationship between electronic procurement and supply chain performance.

4.7.1 Electronic Tendering and organization performance

The first objective of the study was to determine the impact of electronic tendering on organization performance of firms in the energy sector in Kenya. Regression analysis was conducted to determine the proportion of organization performance that could be predicted by electronic tendering. The model $Y= a + \beta 1X1 + \varepsilon$ was fitted. Where Y is organization performance and X_1 is electronic tendering. Result are presented in table 10.

Table 11: Regression Results on Electronic tendering and organization Performance

Model Summary

Model	R	R Square	Adj. R Square	Std. Error
1	0.378	0.177	0.074	0.58575

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24.859	1	24.859	46.379	<0.001
	Residual	50.384	94	0.536		
	Total	75.243	95			

Coefficients[a]

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.158	0.137		23.116	<0.001
	Electronic Tendering	0.217	0.043	0.278	4.786	0.001

a. Dependent Variable: Organization Performance

b. Predictors: (Constant), Electronic Tendering

Regression results in Table 4.10 indicate the goodness of fit for the regression between electronic tendering and organization performance was satisfactory in the linear regression model. An R squared of 0.177 indicates that 17.7 % of the variances in organization performance are explained by the variances in electronic tendering while 83.3% belong to other factors associated with organization performance which were not explained by the model. The correlation coefficient of 37.8% indicates that electronic tendering has a positive correlation with organization performance.

The model was found to be significant (F (1,95) =46.379, p =0.001). The residual sum of squares of 50.384 as shown in table 4.10 indicates that the model does not explain all the variations in organization performance and that there are other factors that account for a higher proportion of this variation. The study further determined the beta coefficients of electronic tendering. Results reveal that electronic tendering is statistically significant in

explaining organization performance at Energy and Petroleum Regulatory Authority.This is supported by β = 0.217, p=0.001. The results imply that a unit change in electronic tendering leads to a positive change in organization performance in relation to Energy and Petroleum Regulatory Authority by the rate of 0.217. The model equation is therefore$Y = 3.158+ 0.217 X_1$. Therefore, the study concluded that electronic tendering has a significant influence on organization performance at Energy and Petroleum Regulatory Authority. This implies that the more efficiently electronic tendering is implemented, the higher will be performance in organization.

4.7.2 Electronic Materials Management and Organization Performance

The second objective of the study was to assess the impact of electronic materials management practices on organization performance of firms in the energy sector in Kenya. Regression analysis was done to establish this relationship. The model $Y= a + \beta 2X2 + \varepsilon$ was fitted. Where Y is organization performance and X2 is electronic materials management. Result of the analysis are presented in table 12

Table 12: Regression results on electronic materials management and organization performance

Model Summary

Model	R	R Square	Adj. R Square	Std. Error
1	.481[a]	0.242	0.288	0.53476

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	23.458	1	23.458	47.390	<0.001
	Residual	46.530	94	0.495		
1	Total	69.988	95			

Coefficients a

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.
			Std. Error			
		B		Beta		
1	(Constant)	2.42	0.145		17.355	<0.001
	Electronic Materials Management	0.369	0.041	0.453	9.057	<0.001

a. Dependent Variable: Organization Performance

b. Predictors: (Constant), Electronic Materials Management

Regression results in Table 4.11 indicate the goodness of fit for the regression between electronic Materials Management and organization performance which was satisfactory in the linear model regression. An R squared of 0.242 indicates that 24.2% of the variances in organization performance at Energy and Petroleum Regulatory Authority are explained by the variances in electronic Materials Management. 75.8% of variation in organization performance is attributed to other factors outside the current model. The correlation coefficient of 48.1 % indicates that electronic Materials Management has a strong and positive correlation with organization performance at the Energy and Petroleum Regulatory Authority.

Table 4.11 also shows the results of the overall model significance. The model was found to be valid and significant at (F (1,95) =47.390, p-value=0.001). The residual sum of squares of 46.530 indicates that the model does not explain all the variations in organization performance and that there are other factors outside the model that account for a higher

proportion of the variation in organization performance. The study further determined beta coefficients of electronic Materials Management. The results reveal that electronic Materials Management is statistically significant in explaining organization performance at the Energy and Petroleum Regulatory Authority. This is supported by $\beta = 0.369$, $p=0.001$. The results imply that a unit change in electronic Materials Management lead to a positive change in organization performance at the Energy and Petroleum Regulatory Authority.by the rate of 0.369. The model equation for electronic Materials Management as a predictor is therefore, $Y = 2.42+ 0.369X_2$

Using results in table 4.11, The study concluded that electronic Materials Management had positive and significant influence on organization performance at the Energy and Petroleum Regulatory Authority.

4.7.3 Electronic Invoicing and Organization Performance

The third objective of the study was to evaluate the impact of electronic invoicing on organization performance of firms in the energy sector in Kenya. Regression analysis was done to establish the relationship between electronic invoicing and organization performance at the Energy and Petroleum Regulatory Authority. The model $Y= a + \beta 3X3 + \varepsilon$ was fitted. Where Y is organization performance and X3 is electronic invoicing.

Table 13: Regression Results on electronic invoicing and organization performance

Model Summary

Model	R	R Square	Adj. R Square	Std. Error
1	0.282	0.226	0.153	0.56366

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	26.853	1	26.853	52.550	0.001
	Residual	48.034	94	0.511		
	Total	74.887	95			

Coefficients a

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.365	0.214		11.007	<0.001
	Electronic Invoicing.	0.346	0.052	0.373	6.824	<0.001

a. Dependent Variable: Organization Performance

b. Predictors: (Constant), Electronic Invoicing

The regression results in Table 4.12 show that the relationship between electronic invoicing and organization performance was significant at (F (1,96) = 52.550, p=0.001). Results also indicate a correlation coefficient (r) of 0.346. The correlation coefficient of 34.6 % indicates that electronic invoicing has a positive correlation with organization performance. With R square of 0.226, the model implies that about 22.6% variation in organization performance at the Energy and Petroleum Regulatory Authority is explained by variations in electronic invoicing. 77.4% of the variation represents other factors associated with organization performance which were not fitted in the model. The beta coefficient for electronic invoicing

in the model was significant (β = 0.346, p = 0.001) indicating that electronic invoicing significantly influences organization performance at the Energy and Petroleum Regulatory Authority, indicating that with one-unit increase in electronic invoicing, organization performance increases by about 0.346 units. The model equation is therefore

$Y = 2.365 + 0.346X_3$

Using results in table 4.11, The study concluded that electronic invoicing had positive and significant influence on organization performance at the Energy and Petroleum Regulatory Authority.

4.8 Summary of analysis results

The summary of the results indicates that based on the beta coefficients (β) electronic contract management has the most influence on supply chain performance with electronic payment following secondly while electronic sourcing has the least influence on the supply chain performance at Kenya Revenue Authority.

Table 14: Summary of analysis results

Hypothesis	Results
What is the effect of electronic tendering on organization performance of firms in the energy sector in Kenya?	Statistically significant influence of electronic tendering on organization performance ($\beta = 0.217$, $p=0.001$)
What is the effect of electronic materials management on organization performance of firms in the energy sector in Kenya?	Statistically significant effect of electronic materials management on organization performance ($\beta = 0.369$, $p=0.001$)
What is the effect of electronic invoicing on organization performance of firms in the energy sector in Kenya?	Statistically significant effect of electronic invoicing on organization performance ($\beta = -0.346$, $p=0.001$)

Source: Researcher (2024)

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions, recommendations and suggestions for further research which was guided by the specific objectives. Three objectives were formulated.

5.2 Summary of the Findings

The purpose of the study was to examine the impact of electronic procurement on organization performance in the Energy sector, a case of Energy and Petroleum Regulatory Authority, Kenya. Specifically, the study assessed the influence of electronic tendering, electronic materials management, electronic invoicing, and organization performance.

5.2.1 The influence of Electronic tendering and organization performance.

The first objective of the study was to determine the impact of electronic tendering on organization performance of firms in the energy sector in Kenya. Regression analysis was conducted to determine the proportion of organization performance that could be predicted by electronic tendering. From this objective, the leading question was “What is the effect of electronic tendering on organization performance of firms in the energy sector in Kenya?”. The results of this study showed a positive statistically significant relationship between electronic tendering and organization performance at Energy and Petroleum Regulatory Authority. Therefore, it is concluded that electronic tendering has significant influence on organization performance at the energy and petroleum regulatory authority. The findings therefore confirmed that electronic tendering is a determinant of organization performance

at the energy and petroleum regulatory authority.

5.2.2 Influence of Electronic Materials Management and Organization Performance

The second objective of the study was to assess the impact of electronic materials management practices on organization performance of firms in the energy sector in Kenya. Regression analysis was done to establish this relationship. The leading question was "What is the effect of electronic material management on organization performance of firms in the energy sector in Kenya?" The results confirmed that there is a positive statistically significant relationship between electronic materials management and organization performance at the Energy and Petroleum Regulatory Authority. Therefore, it is concluded that electronic materials management has significant influence on organization performance at the Energy and Petroleum Regulatory Authority. The findings therefore confirmed that electronic materials management is a determinant of organization performance at Energy and Petroleum Regulatory Authority.

5.2.3 The influence of Electronic Invoicing and Organization Performance

The third objective of the study was to evaluate the impact of electronic invoicing on organization performance of firms in the energy sector in Kenya. Regression analysis was done to establish the relationship between electronic invoicing and organization performance at the Energy and Petroleum Regulatory Authority. The leading question was "What is the effect of electronic invoicing on organization performance of firms in the energy sector in Kenya?" The results confirmed that there is a positive statistically significant relationship between electronic invoicing and organization performance at the Energy and Petroleum Regulatory Authority. Therefore, it is concluded that electronic invoicing has significant

influence on organization performance at the Energy and Petroleum Regulatory Authority. The findings therefore confirmed that electronic invoicing is a determinant of organization performance at the Energy and Petroleum Regulatory Authority.

5.3 Conclusion

The following conclusions can be made from the findings of this study.

5.3.1 Electronic Tendering and Organization Performance

Results indicate that electronic tendering have a positive, significant impact on organization performance at the Energy and Petroleum Regulatory Authority. Findings show that there is a positive, significant effect of electronic tendering on organization performance at the Energy and Petroleum Regulatory Authority. From the result the researcher was able to conclude that electronic tendering was significant in explaining organization performance in the energy sector.

5.3.2 Electronic Materials Management and Organization Performance

Results indicate that electronic materials management has a positive, significant impact on organization performance at the Energy and Petroleum Regulatory Authority. Findings show that there is a positive, significant effect of electronic materials management on organization performance at the Energy and Petroleum Regulatory Authority. From the result the researcher was able to conclude that electronic materials management was significant in explaining organization performance in the energy sector.

5.3.3 Electronic invoicing and organization Performance

Results indicate that electronic invoicing has a positive, significant impact on organization performance at the Energy and Petroleum Regulatory Authority. Findings show that there is a

positive, significant effect of electronic invoicing on organization performance among public organizations. From the result the researcher was able to conclude that electronic invoicing was significant in explaining organization performance at the energy sector.

5.4 Recommendations

From the result of the study, it is clearly shown that all the three factors considered in the study have positive effect towards organization performance in the energy sector. Specially, study observed that electronic tendering had a significant relation that is positive on organization performance at the Energy and Petroleum Regulatory Authority. Recommendation from study is for the energy sector is to put in place as of proactive process of electronic tendering that are in support of organization performance for ensuring improved organization performance.

The study also confirmed that electronic materials management has effect on organization performance in the energy sector. It revealed that there exists a relation that is positive, and significant concerning electronic materials management towards organization performance at the Energy and Petroleum Regulatory Authority. The study consequentially makes a recommendation that the energy sector should put in place proactive structure of managing and maintaining proper electronic materials management in order to ensure improved firm performance.

Furthermore, because findings of the research confirmed that electronic invoicing has effect on organization performance in the energy sector. It is revealed that there exists a relation that is positive, and significant concerning electronic invoicing towards organization performance at the Energy and Petroleum Regulatory Authority. The study consequentially

makes a recommendation that the energy sector and institutions should always ensure a clear and up-to-date process of electronic invoicing so as to add effectiveness so as to ensure improved organization performance.

5.5 Suggestion for Further Study

The purpose of the study was to examine the impact of electronic procurement on organization performance in the Energy sector, a case of Energy and Petroleum Regulatory Authority, Kenya. Study puts a suggestion for studies of similar nature be extended in other sectors and firms. The study also suggests that a further study on some other factors that are likely to affect organization performance that were not covered in the study to be considered.

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Appendix I: Questionnaire for the Respondents

Section A: Demographic Information

What is your Gender (Tick which is appropriate)?

Male ☐ Female ☐

2. What level of education have you attained (Tick which is appropriate)

Primary [ ] Secondary [ ] Tertiary [ ] University [ ]

3. How many years have worked in the organization (Tick which is appropriate)

Below 5 years [ ] 5-10 years [ ] over 10 years [ ]

Section B: Electronic Tendering and Organization Performance

Please select the degree to which electronic tendering affects organizational performance by marking 1 through 5. Key:1=Disagree strongly 2= disagree 3= unsure 4=agree 5=Agree strongly

	Scale of agreement				
Statement question	**1**	**2**	**3**	**4**	**5**
The organization can increase transparency through the use of electronic tendering.					
Supply chain performance is improved by using electronic tendering since it lowers expenses related to traditional tendering.					

Electronic tenders speed up the entire process, which enhances the company's supply chain performance.					
Using electronic tendering aids in standardizing the purchasing procedure across the company's supply chain management.					
When using the company's e-tendering system for supply chain management, there is less room for human error.					

Section C: Electronic Material Management Practices and Organization Performance

Please select the degree to which electronic material management practices impact organizational performance by marking 1 through 5.

Key:1=Disagree strongly 2= disagree 3= unsure 4=agree 5=Agree strongly

	Scale of agreement				
Statement	1	2	3	4	5
By using electronic Material Management techniques, the company's stock levels are improved.					

By using electronic material management to make sure there isn't a lot of excess inventory and that the products supplied meet customer demands, the business can lower capital expenses.					
Electronic material management techniques reduce redundant material handling in the supply chain operations of the business.					
Electronic material management practices enable the organization to facilitate the proper type and quantities acquired initially.					

Section D: Electronic Invoicing and Organization Performance

Please indicate on a scale of 1 to 5 how much electronic invoicing impacts organizational performance.

Key:1=Disagree strongly 2= disagree 3= unsure 4=agree 5=Agree strongly

	Scale of agreement				
Statement	1	2	3	4	5
The cost of procurement transaction is reduced through electronic invoicing.					
Electronic invoicing can make great improvements on transportation and logistics in the company					
With electronic invoicing, the organization is able to speed communication with regards to procurement					
Electronic invoicing reliability of service delivery thereby ensuring improved organization performance					

Section E: Performance of the Organization

Kindly choose by ticking 1-5 the level to which you agree with the statements on organizational performance.

Key:1=Disagree strongly 2= disagree 3= unsure 4=agree 5=Agree strongly

Performance of the Organization	1	2	3	4	5
Regarding procurement, there is a greater adherence to protocols and guidelines.					
We are generating goods and services of higher caliber.					
Planning for procurement has greatly improved.					
Better benchmarks for procurement have been established.					
Procurement integrity and transparency have been improved.					
In general, the performance has improved.					

Appendix II: Informed consent form

Dear sir/madam,

I invite you to participate in a research study entitled "Impact of Electronic Procurement Practices and Organizational Performance at Energy Petroleum Regulatory Authority"**.** I am currently enrolled in the Master of Science Degree in Procurement and Supplies Management of Mount Kenya University and am in the process of writing my Master's project. The purpose of the research is to examine the impact of E-procurement on organization performance in the Energy sector, a case of Energy and Petroleum Regulatory Authority, Kenya. Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. There are no known risks to participation beyond those encountered in everyday life. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researchers will know your individual answers to this questionnaire. There are no direct benefits to you for participating in this research. However, you may find it interesting to talk about the issues addressed in the research and it may be beneficial to the field and to future clients or individuals who have experienced similar concerns

If you agree to participate in this project, please answer the questions on the questionnaire as best you can. It should take approximately 30_minutes to complete. Please return the questionnaire as soon as possible to enable me complete the project report.

If you have any questions about this project, feel free to contact

Peter Mutinda King'oo

0723851840

If you have questions about your rights as a research participant, please be in touch with the Chairman, Mount Kenya University, Ethical Review Committee, P.O Box 342-01000, Thika.

Thank you for your assistance in this important endeavor.

CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix III: ERC PERMIT

Mount Kenya University

REF: **MKU/ISERC/4572** Date: 15 November 2024

TO: **PETER MUTINDA KING'OO**

REG: **MSCP/2023/44938**

Dear Sir/Madam,

RE: IMPACT OF ELECTRONIC PROCUREMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE IN THE ENERGY SECTOR: A CASE OF ENERGY AND PETROLEUM REGULATORY AUTHORITY IN NAIROBI COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **3294.** The approval period is **15/11/2024 - 14/11/2025.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
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 **Mount Kenya University**

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.

MOUNT KENYA UNIVERSITY ETHICS REVIEW COMMITTEE P.O. Box 342-01000, THIKA

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Appendix IV: Introduction Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MSCPM/2023/44938

19th November, 2024

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: PETER MUTINDA KING'OO – REGISTRATION NO. MSCPM/2023/44938

The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Project Management** in the **Department of Management** in the school of **Business and Economics.**

The title of the research is **"Impact of Electronic Procurement Practices on Organizational Performance in the Energy Sector: A Case of Energy and Petroleum Regulatory Authority in Nairobi County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **November, 2024 and January, 2025.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director
Graduate Studies

For
Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Appendix V: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **92365**

Date of Issue: **02/December/2024**

RESEARCH LICENSE

This is to Certify that Mr.. PETER MUTINDA KING'OO of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: IMPACT OF ELECTRONIC PROCUREMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE IN THE ENERGY SECTOR: A CASE OF ENERGY AND PETROLEUM REGULATORY AUTHORITY IN NAIROBI COUNTY, KENYA **for the period ending : 02/December/2025.**

License No: **NACOSTI/P/24/44822**

923653

Applicant Identification Number

Director General

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions