ANALYSIS OF ELECTRONIC PROCUREMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE IN NAIROBI METROPOLITAN, KENYA

ALI WARIO HUNA

RESEARCH PROJECT SUBMITTED FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF MASTER DEGREE IN PROCUREMENT AND SUPPLIES AT THE SCHOOL OF BUSINESS ADMINISTRATION

MOUNT KENYA UNIVERSITY

NOVEMBER 2024

DECLARATION AND APPROVAL

Declaration by Student;

This project is my original work and has not presented for a degree in any other University or for any other award.

Signature……. Date…….

ALI WARIO HUNA
MPSM/2023/51568

Approval by Supervisor;

I confirm that the candidate under my supervision has carried out the work reported in this project.

Signature…….. Date……

Dr Duncan Ndungu Nderui

Mount Kenya University

DEDICATION

Wholeheartedly dedicated, with special appreciation to my beloved spouse, Sabdio Guracha, and my daughter, Talaso Ali, for their unwavering belief in me, constant support, and inspiring encouragement. Your prayers have carried me through this journey.

ACKNOWLEDGEMENT

Would sincerely acknowledge individuals and institutions whose support made this project possible. I thank God for abundant guidance throughout every stage of this journey. Deepest goes to Dr. Duncan Ndungu, steadfast during development. I also extend my heartfelt thanks to my employer for not only providing me with employment but also granting opportunity to pursue education as part of career development. Their support and insights played role in shaping direction. To friends, classmates, and the entire staff—thank you for your assistance, kind words, and encouragement along the way.

ABSTRACT

The landscape of business management has undergone significant transformation, shifting from traditional in-house services and multipurpose functions to the widespread adoption of outsourced services. Study evaluates influence of (e-procurement) practices on performance of operations within the Nairobi Metropolitan area in Kenya. E-procurement systems refer to digital platforms that streamline the entire procurement process from requisition to payment and encompass functionalities such as e-sourcing, e-tendering, e-invoicing, and Procurement Management Information Systems (PMIS). Observation anchored on three: Resource-Based View (RBV), E-Technology Perspective, and Transaction Cost Theory. From primary objective, four specific objectives were derived: assess extent of e-procurement adoption Nairobi Metropolitan area, analyze impact of e-procurement on efficiency in operations, examine role of e-procurement in enhancing transparency and accountability and evaluate effectiveness of e-procurement in managing supplier relationships. These objectives guided formulation of hypotheses for testing. Data was collected using structured questionnaires distributed among respondents Nairobi Metropolitan region. Total of 210 respondents were targeted, comprising 60 individuals from top management and 150 from middle management. Data was analyzed using SPSS Version 29, employing both descriptive and inferential statistics. ANOVA results confirmed model's statistical significance ($p < 0.05$). Study findings revealed that majority of respondents agreed e-procurement practices (mean = 3.79, SD = 0.901), particularly electronic tendering, positively influence organizational supply chain performance. Further results demonstrated Electronic Material Management (EMM) practices significantly enhance supply chain dimensions inventory management, logistics, cost control, and material handling efficiency (mean = 4.09, SD = 0.830). Additionally, electronic invoicing was perceived effective tool for improving cost efficiency, communication speed, and service reliability, which collectively enhance overall organizational performance (mean = 4.09, SD = 0.819). In conclusion, study suggests electronic tendering offers substantial benefits to organizations, including increased transparency, cost savings, standardized processes, and improved efficiency across supply chain. Furthermore, EMM practices were found particularly effective in enhancing logistics, reducing costs, minimizing excess inventory, and ensuring accurate material acquisition. Outcome underscore importance of electronic systems in ensuring accuracy, consistency, and timeliness within procurement processes, ultimately contributing to superior organizational outcomes. Based on findings, study recommends several strategic actions: Enhancement of technological infrastructure, Investment in training and capacity building, Development of comprehensive policy and regulatory frameworks and Standardization of procurement processes.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS & ACRONYMS

B2B- Business to Business

EMM- Electronic Material Management

E-Procurement- Electronic Procurement

ERP- Enterprise Resource Planning

E-Tendering- Electronic Tendering

IT- Information technology

JIT- Just in Time

MRP- Material Requirement Planning

NACOSTI- National Commission for Science, Technology and Innovation

RBVT- Resource based theory

SPSS- Statistical Package for Social Sciences

TAM- Technology Acceptance Model

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter outlines background of the study, articulates problem statement, defines research objectives and questions, and discusses significance, scope, limitations, and delimitations of research

1.1 Background of the Study

Procurement known to involved manual processes that were heavily paper-based. Activities such as requisitioning, tendering, and invoicing managed through physical documents, which often led to inefficiencies, errors, and delays in most of offices. It primarily focused on price negotiation and vendor selection, with limited emphasis on long-term relationships or strategic partnerships. The process was transactional rather than strategic. Procurement was often siloes within organizations, with little integration with other functions like supply chain management, finance, or production. This lack of integration resulted in poor visibility across the supply chain and hindered decision-making. The primary objective of traditional procurement was cost reduction. Procurement professionals were judge on their ability to negotiate lower prices, often without strategic value suppliers.

With globalization, supply chains became more complex, involving multiple countries, currencies, and regulatory environments. This complexity necessitated a strategic approach to procurement, focusing risk management, sustainability. Organizations began to adopt strategic sourcing practices, which involved a more comprehensive evaluation of suppliers, considering factors like quality, reliability, and innovation. The goal was to develop long-term relationships with key suppliers and create value beyond simple cost savings. This shift encouraged procurement professionals to think more holistically and strategically. Organizations started to recognize the value of strong supplier relationships management. SRM became a key focus area, with the aim of fostering collaboration, innovation, and mutual benefit between buyers and suppliers.

Companies are increasingly adopting electronic procurement to remain competitive in a technology-driven market. Failure to implement electronic processes can result in losing competitive advantage (Masudin et al., 2021). E-procurement involves using the internet for buying and selling goods, services, and consultancy, engaging businesses, consumers, and governments in these transactions (Chen et al., 2021). It encompasses integrated web-based database systems for negotiation, ordering, receipt, and payment, aiming to save costs, resources, and time. Although public organizations, it has not yet been fully adopted (Iles, 2017).

The advent the internet, software automation revolutionized procurement practices. These technologies enabled the development of e-procurement systems that could automate and streamline procurement processes. These systems offer several advantages:

According to Saleh (2018), information and communication technology is crucial for industrial and commercial activities, enhancing public organizations' interactions with their customers. The benefits of e-procurement include cost-effective solutions, better customer satisfaction, quality products, shorter lead times, and innovative methods. Additional advantages are the integration and collaboration of data between buyers and sellers or suppliers through the internet. In the 1970s, organizations used Enterprise Resource Planning (ERP), which evolved into commercial internet usage. By the 1990s, the emergence of the World Wide Web and multimedia provided essential resources and facilitated the computerization of procurement (Iles, 2017).

1.1.1 Electronic Procurement

Over the years, the landscape of business management has significantly transformed, moving from reliance services and traditional outsourcing. The use of IT has changed this model. Many companies are currently doing their work using online platforms and other (Chan & Lu, 2019). Shift within the

sector led global organizations to embrace new supply chain-related technologies and applications (Sheng, 2017).

Reis and Soares Aguiar (2016) noted that acquiring services, works through digital platforms and internet-based solutions. It encompasses activities such as supplier selection, ordering, invoicing, and payment, all conducted electronically. This approach is important because it enhances efficiency, reduces costs, increases transparency, and improves the accuracy and speed of procurement processes. Nagle et al. (2016) argued that by streamlining procurement activities, e-procurement helps organizations achieve better supplier management, optimize resource utilization, and ultimately drive greater value and performance in their supply chain operations.

1.1.2 Global Perspective of Electronic Procurement

Found that significantly enhance the information companies their suppliers, thereby strengthening business relationships (Chang, Tsai, & Hsu, 2013). Additionally, research in China emphasized the importance of ICT infrastructure in schools, suggesting that constructing multimedia classrooms could significantly boost ICT usage. To realize the benefits of ICT, students must train in new technologies (Chun, Chin-Chung & Wu, 2015).

Fuchs et al. (2018) conducted study on information technology revealing that a significant this, overall supply chain efficiency. Research specifically explored the relationship.

Similarly, UK public, the adoption of electronic procurement has demonstrated several advantages. Reduces unauthorized spending, improves supply availability, enhances communication, and supports more effective negotiation processes. Study emphasized that adequate support for internal users in adopting new technologies plays a crucial role in minimizing unauthorized purchases. Additionally,

improved procurement system contributed to a reduction in overall cost of acquiring goods and services, primarily through lower processing costs for purchase requisitions.

1.1.3 Regional Perspective of Electronic Procurement

Kakwezi, Nyeko (2010) revealed that public hindered by insufficient reliable information regarding procurement procedures, including details on inputs, outputs, resource utilization, and outcomes. This deficiency influences their ability to evaluate efficiency and effectiveness. In Tanzania, Sijaona (2010) identified several implementations, such as challenges frameworks, ICT infrastructure, personnel. Suleiman (2015) observed that although Tanzania acknowledges the advantages of processes for comprehensive implementation. In Rwanda, Ruzindana and Kalaskar (2016) found that to improve the adoption of electronic procurement among employees, organizations must address perceived risks related to internet connectivity.

1.1.4. Local perspective of Electronic Procurement

In Kenya, Ministry of Finance launched an e-procurement initiative to implement electronic systems in select ministries, with plans to scale across government departments (RoK, 2014). Several private firms have also adopted successfully. Gitahi (2011) talked on how Nation Media Group's introduce N-Soko platform, which enables online purchases. Mwangi and Mburu (2015) found that ICT adoption significantly enhanced service delivery in star-rated hotels. Nonetheless, despite these benefits, the adoption of ICT in procurement remains slow (Segal & Taylor, 2001).

1.1.5 Nairobi Metropolitan

The adoption of e-procurement practices in Nairobi Metropolitan has significantly enhanced supply chain performance by increasing efficiency of procurement processes. Automation of tasks such as requisitioning, tendering, and payment processing has reduced the time required for procurement

cycles, allowing for faster project implementation and service delivery, by reducing manual processes and enabling competitive bidding through e-tendering and e-auctions, the region has achieved substantial cost savings. These savings are particularly important in public procurement, where budget constraints are common and transactions, which enhances transparency. This reduces opportunities for corruption and fosters greater accountability among procurement officers and suppliers. While Nairobi Metropolitan has made significant strides in adopting e-procurement, challenges remain in terms of technological infrastructure. Issues such as internet connectivity, system downtimes, and the digital divide between urban and rural areas can hinder the full potential of some resistance adopting practices among procurement officers and suppliers' implementation and effectiveness systems effective use of e-procurement requires training and capacity building for procurement officers, suppliers, and other stakeholders. Ensuring that all parties adequately trained to use the systems is success initiatives. By continuing to innovate and invest in e-procurement, Nairobi Metropolitan can further optimize its supply chain operations and improve public service delivery.

Decentralization involves shifting some government decision-making powers related to service delivery from the central government to local communities. Devolution is the most robust form of decentralization, as it establishes local governments elected by citizens that have the autonomy to make decisions on service delivery. Each level of government comprises legislative and executive branches, while the Judiciary serves both National and County Governments.

Kenya's devolution process aims to achieve several key objectives as outlined in Article 174 of the Constitution. These objectives encompass promoting democratic and accountable governance, fostering national unity through the acknowledgment of diversity, empowering individuals with self-governance, and enhancing community involvement in governmental processes. Additionally,

devolution aims to safeguard interests, ensure fair allocation resources, decentralize state organs and their services away bolster along with. Kiambu, Murang'a, Kajiado, and Machakos Counties are part of the Nairobi Metropolitan Area. Only specific areas within these counties fall under the metropolitan territory, with Nairobi County being entirely included.

1.2 Statement of the Problem

Effective timely delivery of E-procurement solutions provide a number benefits to the County Governments, including improved performance. able to streamline procurement process, leading to cost savings, improved supplier relationships, and improved data visibility and management. These benefits including improved inventory, better forecasting, and reduced lead times (Mesquita & Frazão, 2019). Additionally, e-procurement can reduce paperwork and other administrative costs, enabling county governments to focus their resources on more productive activities (Das et al., 2018). Furthermore, e-procurement can improve risk management by providing greater traceability (Biswal et al., 2017). By providing visibility into the entire procurement process, e-procurement can help to identify potential risks and areas of improvement, enabling county governments to manage their supply chain performance.

Knowledge gaps identified in previous studies also serve as a key motivation for this research, as limited attention has been given to relationship of electronic procurement, supply chain performance within Nairobi Metropolitan region. Instance, Vijayaraghavan and Raju (2008) examined the influence of transport and logistics, presenting a contextual gap due to the different geographical and economic setting. However, focused on only one variable relevant to the current study, thereby highlighting a conceptual gap.

Mungu (2013) investigated influence of logistics management on stock levels of essential medicines in public health institutions. While insightful, emphasized stock levels rather than the broader scope of supply chain performance, thus presenting a thematic gap. Additionally, Gitonga (2017) examined effects of logistics management on operational performance among (FMCG). While contextually relevant, logistics and operational performance rather than electronic procurement practices, reinforcing the need for the current study.

Recently, there have been several procurement scandals in the supply chain department in several counties in Kenya. Several procurement scandals, such as overpriced goods and biased tender awards, have occurred due to weak institutional control (Daily Nation, September 13, 2021). This has contributed to a decline in financial performance within county governments. Inefficiencies in procurement practices and procedures have prompted the adoption of onlne systems in promoting firm success in the counties (Mafini, Dhurup & Madzimure, 2020).

Nyaboga (2020) noted the importance of top management support for successful implementation. Ineffective e-procurement leads to delays in goods delivery, inconsistent decision-making, poor record keeping, and information distortion. Chen et al. (2021) advocate for digital methods in public sector procurement to enhance transparency and integrate procurement functions with other departments.

In the context of modern supply chain management, particularly within rapidly growing urban areas such as Nairobi Metropolitan, traditional procurement practices face several significant challenges that hinder efficiency, transparency, and overall performance. These challenges necessitate adoption and influence of electronic procurement practices operations.

Traditional procurement faces challenges inefficiency, especially in the public sector. E-procurement offers solutions to these issues, making it vital for improving supply chain performance in fast-growing regions like Nairobi Metropolitan.

1.3 Purpose of the Study

Main objective is examining influence electronic procurement practices on supply chain performance Nairobi Metropolitan area, Kenya.

1.4 Objectives of the study

Specific objectives:

i. Assess Extent of E- Tendering Adoption in Nairobi Metropolitan
ii. Analyze Impact of E-Invoicing on Efficiency in Supply Chain Operations
iii. Examine E-Sourcing in Enhancing Transparency and Accountability
iv. Assess Effectiveness of procurement management information system in Supplier Relationship Management

1.5 Research Questions

i. What percentage of procurement processes in Nairobi Metropolitan conducted electronically?
ii. How does e-procurement reduce procurement cycle times compared to traditional methods?
iii. How does e-procurement reduce the risk of fraud and corruption in procurement?
iv. How does e-procurement influence the supplier selection process?

1.6 Significance of the study

Study offers valuable insights practical recommendations procurement within region. Study is important for several reasons, addressing e-procurement, which can guide the development and refinement of procurement policies. Government agencies can leverage these insights to develop and implement more

effective e-procurement frameworks. By the challenges and benefits of e-procurement, public sector entities can ensure compliance with procurement regulations and align with international best practices. This is particularly important for meeting the standards set by the Public Procurement Regulatory Authority (PPRA) and other oversight bodies.

The study will highlight how private sector organizations can leverage processes, improve. This is critical for maintaining competitiveness in a dynamic market environment. Insights from the study will assist private companies in optimizing their supplier management strategies, fostering stronger and more collaborative relationships, and enhancing the overall reliability and performance of their supply chains.

The study will also identify best practices in e-procurement that procurement professionals and supply chain managers can adopt to improve their operations. Additionally, the study's findings can inform equipping professionals needed implement systems. Study will emphasize importance of data analytics in procurement, encouraging professionals to make more informed and strategic decisions based on real-time data from e-procurement systems.

Study will contribute to existing knowledge on countries such as Kenya. It will provide a localized perspective on how e-procurement practices used basis for further can case studies or benchmarks for other researchers examining similar topics in different regions or sectors. The study's methodology and results can offer valuable insights into the complexities of e-procurement implementation in diverse contexts.

Policy makers and development agencies can use the study's findings to support strategic initiatives aimed at modernizing procurement practices and enhancing supply chain resilience. This is particularly relevant for urban development projects in Nairobi Metropolitan, where efficient procurement is critical to the success of large-scale infrastructure and public service projects. The study will provide evidence supporting broader e-government initiatives that seek to improve

governance, reduce corruption, and enhance public sector efficiency.

1.7 Scope of Study

Studies focus Nairobi Metropolitan area, which encompasses Nairobi County and its surrounding counties, including Kiambu, Kajiado, and Machakos. This region is a significant economic and administrative hub in Kenya, making it an ideal location to study.

The study will examine practices use systems like Integrated Financial Management Information System (IFMIS), focusing on their adoption and implementation in both public and private sector organizations within the Nairobi Metropolitan area. It will assess covering efficiency (e.g, cycle time, cost reduction), transparency (e.g., reduction in fraud), supplier relationships, and overall supply chain reliability. The study will treat e-procurement practices, supply chain performance.

Study will primarily focus on public sector entities within Nairobi Metropolitan, including government ministries, agencies, and county governments. Public's crucial understanding the broader on governance, public service delivery. The study will also examine selected private sector organizations that have adopted e-procurement practices. This will provide a comparative perspective on how e-procurement affects supply chain operations across different sectors. The study will target procurement officials and supply chain managers within public sector institutions and private companies in Nairobi Metropolitan. These individuals adoption, and management systems. The study will also gather insights from suppliers and vendors who interact with e-procurement systems, as their experiences and feedback are critical in evaluating the effectiveness of these practices. Input from policy makers and regulatory authorities will be sought to understand regulatory environment and its influence. Study will cover period of 2024 to 2025 during practices Nairobi Metropolitan region. Period allow for an assessment how these practices evolved and their long-term impact.

1.8 Limitation of the Study

Accessibility and reliability data, concerning the adoption of e-procurement practices in smaller, less

digitally advanced organizations. The study is limited to the Nairobi Metropolitan region, and its fully in Kenya. Changes in the economic environment, such as inflation or fluctuations in exchange rates, might influence e- procurement practices and performance but may not fully account for in the study. Ongoing changes in trade policies or regulations might affect e- procurement operations in ways that not reflected in the study's timeframe. While study includes public and private sectors, the primary focus is on the public sector. As a result, the findings may be more reflective of the public sector's experiences and less applicable to the private sector.

1.9 Delimitation of the Study

Confined Nairobi Metropolitan region, includes Nairobi County and its surrounding counties (Kiambu, Kajiado, and Machakos). This specific geographic focus allows for a detailed examination and an urban setting, but the findings may not directly apply to rural areas or other regions in Kenya.

While the study will include some analysis of the private sector, the primary focus will be on public sector entities within the Nairobi Metropolitan region. This delimitation is significant government region's economy and the availability of data on public sector e-procurement initiatives. Private sector organizations will be included only to provide a comparative perspective, not as the focus of the study. Private's e-procurement practices examined in a general context, without delving deeply into industry-specific details.

It will not cover other procurement-related technologies or practices, such as Enterprise Resource Planning (ERP) systems, unless they directly integrated with e-procurement platforms. Traditional, non-electronic procurement methods will not be the primary focus of the study, except where necessary for comparative analysis. The study will not explore in detail the broader supply chain processes that are unrelated to procurement.

Adoption and within the last 10 to 15 years. Earlier developments in procurement practices will on

reference to provide historical context and not as the main subject of analysis. The study will not attempt to make long-term future projections about the development of e-procurement practices, though it may briefly discuss potential trends based on current data.

However, it will not employ experimental or longitudinal methods. The analysis based on cross-sectional data collected during the study period. The study will not include experimental or quasi-experimental designs. Instead, it will rely on surveys, interviews, and secondary data analysis to gather insights.

1.10 Assumption of the Study

Research assumed a number of public and private sector organizations within Nairobi Metropolitan have adopted e-procurement practices to some extent. For impact it is essential that these practices are in place and operational within the target organizations. Without sufficient adoption, it would be challenging to measure their influence.

The study assumes that accurate and sufficient data regarding practices performance metrics will available the selected organizations within Nairobi Metropolitan. This includes data on procurement cycle times, cost savings, supplier performance, and other key indicators relevant to the study.

Researcher assumed that procurement officials, suppliers, key within the Nairobi Metropolitan region will be providing information through surveys, interviews, and other data collection methods. The study's success depends on the willingness of these stakeholders to share their experiences, insights, and data regarding e-procurement practices. Their participation is crucial for gathering.

Study assumes the implementation e-procurement practices are relatively consistent across the organizations within Nairobi Metropolitan, allowing for comparative analysis. While there may be variations in the extent study assumes level consistency in core practices (e.g., e-tendering, e-

invoicing) that enables meaningful comparisons across different organizations and sectors.

It assumed that have influence affecting factors such as efficiency, transparency, and supplier relationships. This assumption is foundational to the study, as the research seeks to quantify and qualify. If practices do not influence these outcomes, the study's primary focus would be undermined.

The study assumes that respondents will provide honest and objective responses during interviews, surveys, and other forms of data collection. Integrity of honesty objectivity participants. Bias or inaccuracies in responses could skew the results and lead to incorrect conclusions.

It assumed that existing literature relevant frameworks and theories that applied to the context of Nairobi Metropolitan. The study will rely on established theories and models from existing literature to frame its analysis. The assumption is that these frameworks are applicable to the local context and can be adapted to the specific conditions in Nairobi Metropolitan.

The study assumes required practices are in place within the organizations studied. Practices heavily the and functionality supporting technology, such as internet connectivity, e-procurement platforms, and data management systems.

The study assumes that the policy and regulatory environment in Nairobi Metropolitan supports practices. Study assumes a supportive regulatory framework is in place to enable the widespread use of these practices.

1.11 Operational Definition of Terms

Electronic Procurement: use of technologies handle various stages of the procurement process, reducing both cost and time (Croom and Brandon, 2004).

Devolution Performance: It measures departmental policies and operations' results in terms of value and quality of services (Rubambey, 2002).

E-tendering: The process of selecting contractors using internet-based ICT infrastructures, reducing face-to-face transactions and collusion (Vaidya et al., 2006).

Electronic Invoicing: Electronic invoicing involves processing invoices digitally, allowing for online creation through a supplier portal or document scanning

Electronic Materials Management: refers to use of digital systems, technologies to plan, control, manage the flow of materials and resources within an organization.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examines relevant theoretical, empirical, and conceptual, offering researcher a deeper understanding of relationships between study variables.

2.2 Theoretical Literature

Study supported: Transaction Cost Theory, E-Technology Perspective, and Resource-Based View (RBV) . Among these, RBV serves as anchor theory.

2.2.1 Transaction Cost Theory

Suggests negotiating with limited number suppliers. Increasing suppliers reduces this risk, as it allows organizations to negotiate better procurement deals by decreasing dependence single selection of suppliers involves balancing transaction factors such as Information technology can lower coordination costs by standardizing and automating procurement processes, enabling organizations to work with more suppliers efficiently. This is particularly beneficial for purchasing standardized goods like copper pipes. According to Dedrick et al. (2008), IT enables organizations by focusing options and consolidating purchases to benefit from volume discounts.

IT facilitates reduction coordination costs, such as through electronic marketplaces that lower cost of searching and obtaining information about products pricing (Bakker et al., 2008). Collaboration, enabled IT, reduces by facilitating information sharing, lowering supply chain uncertainty, and minimizing contracting costs. For example, if a supplier cannot predict the price of inputs accurately, it may hesitate to enter into long-term contracts management, uncertainty arises from various factors, including variability changes disruptions (Koufteros, 1999).

Refer disruptions in the upstream supply chain, such as late deliveries or material shortages, which can affect manufacturing and sales downstream. Demand uncertainty occurs in the downstream supply chain and factors like and seasonal fluctuations (Johnston, 2005). Technology uncertainty stems from challenges in selecting appropriate technologies, such as choosing between older, reliable manufacturing technologies and newer, unproven ones (Koufteros, 1999; Klein, 2007). Other uncertainties may arise from social, natural, or political factors, such as strikes, natural disasters, or fuel crises (Johnston, 2005).

TCE with uncertainty being a core element of the theory. Early TCE literature forms, but studies have disaggregated it. For instance, Wendin (2001) and Khalifa & Shen (2008) differentiate comes from external factors like technology, natural events, and consumer preferences, potentially causing coordination problems or technological challenges (Sulek et al., 2006). Secondary uncertainty relates to opportunism in transactions. Primary uncertainty refers to a lack of knowledge about external factors, while competitive uncertainty arises from competitors' actions (McManus, 2002). Supplier uncertainty, a form of behavioral uncertainty, involves the potential for encompasses factors like suppliers' and competitors' actions, along with technological and regulatory uncertainty, contributing to both primary and secondary uncertainty (Trent, 2007). This effect has been observed in industries such as food (Johnson & Whang, 2002) and automotive (Nagle et al., 2006). Mitigating the bullwhip effect through information sharing reduces uncertainty and asymmetry within the supply chain, aiding in better capacity planning, production, and inventory management (Lee et al., 2003). However, while information sharing offers benefits, it can also raise transaction risks due to increased transparency, potentially encouraging opportunistic behavior.

2.2.2 The E -Technology Perspective Theory

E-procurement enhances networking between via the internet, particularly in control (Lee, 2003). It a seamless process (Brousseau, 2000). Min & Galle (2002) define as practice using electronic tools to identify suppliers, engage with them, and process payments.

The internet has become integral for improving both business processes (Barratt & Rosdahl, 2002). While trade benefits settings are significant (Min & Galle, 2002). It allows companies to integrate their supply chains, sharing performance, availability, and pricing data, which helps optimize schedules and prices for both buyers and suppliers (Morris et al., 2000).

E-procurement systems are typically adopted for managing product and service purchases (Min & Galle, 2002). However, the adoption process is still evolving, collaboration envisioned.

2.2.3 Resource - Based Theory

E-Procurement is use and technologies interactions between buyers and suppliers. adoption improves efficiency, reduces operational costs, and enhances transparency and accountability.

RBT is used to examine IT enhancing within organizations. According to this theory, IT can be considered a strategic resource that provides economic benefits to firms. It is deemed sustainable if it is valuable, rare, difficult to imitate, and cannot be easily substituted (Bales & Fearon, 2006). This sustainability is crucial in determining the long-term.

IT's role seen through lens RBT as a key resource that firms use to sustain competitive advantage. According to Caridi et al. (2004), IT, when strategically managed, provides economic rent and helps firms maintain superior supply chain capabilities. Its sustainability depends on whether the resources

supporting it are rare and difficult for competitors to replicate.

One of the core ideas of RBT is that the resources a firm controls are not easily transferable or replicable by competitors. For IT to remain a sustainable competitive advantage, firms need to leverage unique resources such as co-specialized assets (Teo & Benbasat, 2003), historical conditions, and tacit knowledge that competitors cannot easily acquire.

The nature of IT is dynamic. Sustainability an IT-driven advantage evolves over time, as technology changes and competitors adapt. This is a crucial factor in understanding how e-procurement practices can impact supply chain performance in a fast-evolving environment like the Nairobi Metropolitan area.

Firms often develop IT systems like e-procurement tools from capabilities and knowledge gained through experience. These systems are sustainable because competitors may lack the time or learning capabilities to replicate them. In the case of Nairobi's supply chain, adopting e-procurement systems based on accumulated knowledge and capabilities could provide long-term competitive advantages.

theory emphasizes unique and capabilities essential for gaining achieving superior. Within the context of Nairobi Metropolitan, Kenya, this perspective is particularly relevant when examining.

From an RBV standpoint, these digital tools and platforms represent strategic resources that, when effectively harnessed, can significantly enhance supply chain efficiency and integration.

Empirical studies conducted in Kenya have demonstrated practices stronger supply chain integration, improved information enhanced among. For example, research on commercial banks in Nairobi shows that implementation positive underlining its role as a key driver of operational effectiveness.

In conclusion, the RBV framework highlights the strategic value of digital procurement capabilities. Organizations within the Nairobi Metropolitan area that successfully adopt and utilize e-procurement technologies are more likely their operations sustainable edge.

2.3 Empirical Literature

This presents of review aims to enhance knowledge by identifying gaps in previous research that warrant further investigation. It will highlight points of divergence and convergence, helping to pinpoint areas in the literature that require additional exploration. These gaps will underline the significance of the study, serving as a foundation for the research at global, regional, and local levels.

2.3. 1 Extent of E – Tendering on supply chain performance

Advent digital technologies internet, cloud computing, and software automation revolutionized procurement practices. These technologies enabled the development of e-procurement systems that could automate and streamline procurement processes.

Kamotho (2014) noted that e-tendering, the process of conducting tenders through electronic means, has significantly transformed procurement practices by introducing greater efficiency, transparency, and accessibility. By utilizing digital platforms, organizations can streamline the tendering process. E-tendering allows for broader participation from suppliers, leading to increased competition and potentially better pricing. automation tender-related tasks minimizes human error, ensures compliance with procurement regulations, and provides a clear audit trail, enhancing reducing informed and strategic decisions, ultimately improving their procurement outcomes.

Gathima and Njoroge (2018) also argued that extends beyond cost savings and efficiency gains. By fostering a more competitive and transparent procurement environment, e-tendering helps organizations build stronger relationships with suppliers. These improved relationships can lead to better terms, higher quality supplies, and more reliable delivery schedules, all of which contribute to

smoother operations and higher overall performance. Additionally, the data collected through e-tendering platforms can analyze procurement trends, supplier areas for procurement aligning them more closely with their broader organizational goals and driving sustained performance improvements. Tendering is an e-procurement practice where potential bidders submit binding proposals detailing the price and terms for providing specific goods, works, or services. Once accepted, the proposal forms the basis of the contract (Lyons & Farrington, 2006). In Kenya, tender notices are widely disseminated through print and electronic media, with a 14-day period for bidders to obtain bid documents, either from public organizations or via websites. Tender information is accessible through the Public Procurement Information Portal (PPIP), which provides details on procuring firms, vendors, bid notices, and awarded contracts. Entities must upload information to the PPIP monthly, typically by the 15th.

The Government Tenders Opportunities website also highlights tenders reserved for women, youth, and persons with disabilities, while individual public procurement entities post opportunities on their own websites. Government tenders below specific thresholds are often posted on notice boards at public offices and local government centers.

Auditor General's report on public procurement, tendering process tendering, tendering, award. An analysis of procurement violations in the Ministry of Education between 2013/14 and 2015/16 revealed that most violations (63%) occurred during the post-award stage, with 29% during the tendering phase, and the rest in the pre-tendering phase.

2.3.2 Impact of E-Invoicing on supply chain performance

Generates network. These integrate automating the billing process. E-procurement revenues typically come from transaction fees. Effective pricing models like Fixed Pricing and Dynamic Pricing allow better help manage.

Fixed is based on predetermined catalog or negotiated prices, while Dynamic Pricing lets market forces determine the price, such as in reverse auctions or exchanges.

Billing management improves requisition, invoicing, and payment accuracy by automating processes and using electronic documentation, thus reducing transaction costs.

Siemsen et al. (2008) despite mandatory may bypass e-procurement provisions. While some studies highlight e-procurement's role in improving accountability, Subramaniam and Shaw (2002) note that it enhances price setting and billing management. However, others caution that merely implementing e-procurement doesn't guarantee compliance, as user perceptions of the system can affect contract adherence (Turban et al., 2006).

The electronic businesses send receive invoices (Brun, 2008). Hernandez-Ortega (2011), businesses capture transaction data and transmit it over a network, enhancing the management of across. It also strengthens transactions.

Several studies underscored benefits of e-invoicing. Chegugu and Yusuf (2017) examined its effect on public hospitals in Uasin Gishu County, Kenya, surveying 367 respondents across five hospitals. Their findings indicated that e-invoicing significantly enhanced procurement efficiency by improving

supplier charge tracking. However, the study had empirical gaps, notably its exclusion of e-sourcing, e-payment, and e-tendering, as well as its limited focus beyond hospitals.

Similarly, Waganda (2018) investigated e-procurement in United Nations agencies in Nairobi and found that e-invoicing positively influenced procurement performance by reducing costs, accelerating payments, and improving data security. Yet, this study also did not address other e-procurement components or focus on SMEs within Nairobi City County.

Both studies contribute to the understanding of e-invoicing's role in procurement, but there are contextual and empirical gaps, particularly in relation to the inclusion of SMEs and the absence of practices sourcing, e-tendering.

2.3.3 Role of E- Sourcing on supply chain performance

Hunsinger (2015) highlights e-procurement in identifying, evaluating, and negotiating with suppliers, as well as building strong supplier and customer relationships, ultimately aiding organizational performance. The goal services at the lowest total cost while achieving organizational objectives (Chitungo & Munongo, 2013). It enhances knowledge within an organization and trains staff on such as times, allows to identify new suppliers across spatial boundaries (Lu, 2015). This process increases competition and reduces risks in spend categories (Williams & Wynn, 2015).

Carlisle, (2006) on adoption Northern Ireland's construction industry found that e-procurement was driven by improvements in communication and cost reductions through IT, while barriers were linked to security and legal concerns. Kamotho (2014) explored e-procurement adoption in Kenyan government agencies, revealing that many state corporations had adopted e-procurement practices, which positively impacted procurement performance. Similarly, Ateto, Ondieki, and Okibo (2013)

evaluated how e-procurement systems improved efficiency and value for money in public hospitals, specifically Kisii Level 5 Hospital, identifying poor change management.

Further, Dzama and Matavire (2013) investigated the adoption of e-procurement at CBZ Bank in Zimbabwe, focusing on strategic sourcing and the factors influencing adoption, including financial stability, cost, and strategic factors. They concluded that strong management support was crucial for effective adoption and the realization of strategic benefits.

Idrees et al. (2022) argue that e-sourcing involves using internet technology to identify potential suppliers for specific spending categories, enhancing competition among suppliers and improving organizational performance (Ribeiro & Henriques, 2011). Songip et al. (2013) further define e-sourcing as the process of creating, approving, and placing orders for goods and services via software systems based on internet technology, which boosts organizational performance. E-sourcing primarily focuses on indirect goods and services, those not directly related to the final product (Van Weele, 2010). These systems, such as ordering catalogs, are used throughout the organization, while enterprise resource planning systems manage direct goods and services, often requiring planned ordering (Salford & Roche, 2010).

Electronic ordering solutions streamline repetitive manual processes, reduce paperwork, lower costs, increase productivity, and improve customer service, thereby enhancing performance (Porter & Millar, 2015). Mentzer (2010) notes that online ordering systems enable customers to place orders through a company's website, which can boost sales by providing convenient home access (Minahan & Degan, 2011). Beyond facilitating transactions, e-sourcing also improves workflows, enhances flexibility, and fosters transparency in buyer-seller relationships, promoting better negotiations and creating richer arbitrage opportunities (Moon, 2015; Wong & Sloan, 2014).

E-sourcing also allows purchasing teams to focus on strategic activities, such as developing supply bases, managing supplier relationships, integrating suppliers into innovation processes, and restructuring value chains (Songip et al., 2013). Issa et al. (2013) found that e-sourcing helps identify suitable suppliers, ensuring the receipt of high-quality goods and services. While electronic sourcing reduces coordination and search costs in some contexts (Mentzer, 2010).

2.3.4 Procurement Management Information Systems on supply chain performance

This data helps organizations optimize system performance, analyze growth patterns, and adapt to market or technical needs. Continuous monitoring of system security and traffic is crucial to prevent breakdowns, security issues, scalability problems, and poor marketplace performance caused by inefficient transaction engines.

Aberdeen, (2011), systems have delivered significant benefits, including a 70%-80% reduction in requisition-to-fulfillment cycles, a 73% reduction in administrative costs, a 5%-10% decrease in material prices, halved off-contract buying, and a 25%-50% reduction in inventory costs. System management these achievements automating validation electronic proposals, allowing suppliers to receive immediate feedback. Moreover, modern e-procurement systems automate processes such as order creation, approval routing, order transmission to vendors, invoicing, and payments, significantly reducing effort and time.

E-procurement systems also drive substantial financial savings. For example, the Bank of Ireland saved within and improvements. Alcoa Inc., a major aluminum producer, adopted e-procurement in 1999 to reduce operating resource costs and integrate supplier relationships.

By leveraging tools like the internet and intranet, organizations can automate their procurement processes, which reduces time-to-market, minimizes inventory, and lowers costs associated with

capital assets, such as storage and taxes. Dell, for instance, emphasizes the importance of linking updated daily demand with inbound supply flows to optimize inventory management and achieve "virtual integration" (Dell, 1999).

2.4 Conceptual framework

Mathieson, (2001) defines conceptual framework as written product that outlines main elements, including their narratively or graphically. Stratman and Roth (2004) explain that conceptual frameworks are built from broad theories and ideas, helping researchers identify problems, frame relevant.

academic research starts with conceptual framework, as clarifies research questions and objectives. Figure 1 below illustrates conceptual framework, featuring four Procurement Management Information Systems and one dependent variable, Supply Chain Operation Performance.

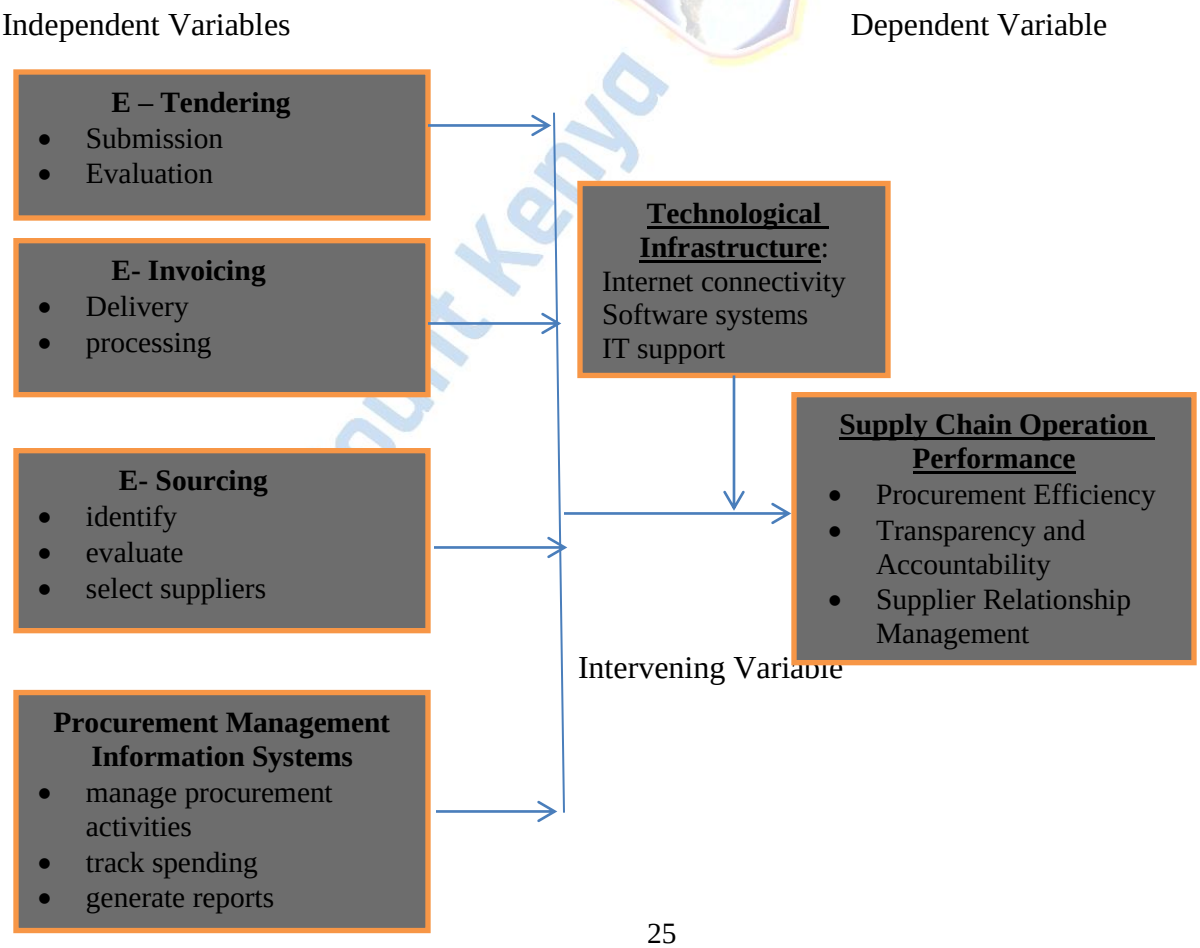


Figure 1: Conceptual framework
Source: Author, 2024

2.5 Recap of Literature Review

Procurement processes were manual and paper-based, characterized by inefficiencies such as lengthy processing times, high costs, and limited transparency. The shift towards e-procurement emerged as a response to these challenges, more efficient, transparent processes. Globally, significant e-procurement practices, especially like comprehensive e-procurement systems to streamline procurement processes, enhance transparency, and reduce costs.

These components of e-procurement are crucial for automating the tendering and supplier selection processes. Studies highlight that e-tendering improves transparency by providing equal access to bidding opportunities, while e-sourcing allows for a broader and more competitive supplier base. E-invoicing and e-payment systems noted for their role in reducing processing times and errors, improving cash flow management, and enhancing supplier relationships. Literature indicates that these systems contribute to more efficient financial management within the supply chain. These provide a centralized platform for managing all procurement-related activities.

Numerous studies suggest that e-procurement practices lead to significant improvements in procurement efficiency. These improvements are measured through reductions in procurement cycle times, cost savings, and more streamlined processes. The automation of procurement tasks reduces human errors and administrative burdens. E-procurement enhances transparency by providing audit trails, reducing opportunities for fraud and corruption, and ensuring compliance with procurement regulations. This is particularly important in the public sector, where transparency is crucial for maintaining public trust. The literature also indicates that e-procurement positively influences supplier relationships by facilitating better communication, faster transactions, and more reliable contract

management. However, some studies caution that the benefits may be limited if suppliers are not adequately equipped or willing to engage with e-procurement systems.

Literature is lack of adequate technological infrastructure, particularly in developing regions like Kenya. This includes issues such as poor internet connectivity, limited access to appropriate software, and inadequate IT support. Another significant barrier is resistance from both procurement professionals and suppliers, who may be accustomed to traditional methods and wary of adopting new technologies. This resistance can stem from training, job displacement, or reliability e-procurement systems. The literature points out that inconsistent or unclear regulatory framework. In Kenya, for example, while there have been efforts to promote e-procurement, challenges remain in fully integrating these systems within the existing regulatory environment.

Case studies focusing on Kenya, particularly within the Nairobi Metropolitan region, provide insights into the practical implementation of e-procurement. These studies highlight successes and ongoing challenges, such as partial adoption, issues with system integration, continuous. Comparative analysis of e-procurement practices in Nairobi Metropolitan with other regions or countries shows varying levels of success, often linked to differences in infrastructure, government support, and the private sector's engagement.

2.6 Research Gap

Due to growing adoption of electronic procurement, several gaps remain understanding full impact, particularly in the Kenyan context. Global research on exists, lack of comprehensive empirical studies focusing on Kenya's unique business environment, regulatory frameworks, and technological infrastructure. Secondly Most studies on e-procurement in Kenya focus on government institutions and large corporations. its impact SMEs, non-profit organizations, and other private sector players. There

is limited research on how e-procurement integrates with other digital supply chain management tools, such as block chain, and in enhancing efficiency decision-making.

Most existing studies assess short-term benefits, such as cost reduction and process efficiency. However, research is needed to evaluate strategic relationships, competitive advantage, supply chain resilience. Government policies in Kenya have not been extensively studied. There is a need to analyze whether existing procurement laws effectively support digital transformation in supply chain management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This outlines methodology used also provides details on study location, research design, target population, sampling procedures, data collection methods, presentation techniques, ethical considerations.

3.2 Research Methodology

Research methodology outlines approaches, tools, and techniques employed to collect and analyze data for studying electronic procurement practices and their impact on supply chain performance within Nairobi Metropolitan area, Kenya. Methodology ensures research questions are addressed systematically and reliable, valid, and actionable results are produced

3.3 Research Design

This design helps in understanding how various e-procurement practices (e.g., e-tendering, e-sourcing, invoicing and Procurement Management Information Systems) affect the efficiency, effectiveness, and overall performance of supply chains in this region.

3.4 Target Population

Dahabreh et al. (2021) define the group of from which data is collected for generalization purposes, or the findings. In this study, target will include 60 top management employees and 150 middle-level management employees, totaling 210 respondents.

Table 1: Target Population

Population Category	Target Population
Top Management	60
Middle Level Management	150
Total	210

Source: Researcher, 2024

3.5 Sampling Techniques and Sample Size

A will be employed a representative sample. Sample will be stratified based on the type of organization (public, private, non-profit) and the scale of procurement operations. This ensures that different perspectives across various sectors are captured. Tripathi, (2020) assert is a key aspect of statistical practices, involving the selection of specific units intended to provide particular insights into the population, especially when making statistical inferences.

A sample is often described as a subset or portion taken from population that researcher is interested in studying (Bolarinwa, 2020). This subset should be ensuring is entire sharing same attributes. Sampling is through entities from for the study (Tripathi et al., 2020). It is defined as the method of choosing a small group of individuals in a way that ensures they represent the larger population.

For this study, sampling will be determined. With target population of 210, the sampling table indicates that should be. Therefore, sample for this study will be 179.

Table2: Sample Size Determination

Population Category	Target Population	Percentage (%)	Sample Size
Top Management	60	60/210*179	51
Middle Level Management	150	150/210*179	128
Total	210		179

Source: Researcher (2024)

3.6 Construction of Research Instruments

The study consisting of three sections: Section I covers background information, Section II addresses electronic procurement (E-tendering, E-sourcing, E-invoicing, and Procurement Management Information Systems), and Section III focuses on supply chain operations' performance in the Nairobi Metropolitan area. Questionnaire includes to convert capturing opinions of all.

3.7 Piloting of Research Instruments

Study tools were assessing. For piloting process, 10% sample size, or 18 participants, will be selected as respondents, but these participants collection. Piloting involved 8 director's staff, 10 operational staff members.

3.7.1 Testing of Validity

Ensure high content validity, the research tools will be reviewed by field experts and the supervisor, who will assess the relevance and meaningfulness of the statements. The tools will be revised based on their feedback before.

3.7.2 Testing of Reliability

Reliability, according to various scholars, is ability of research tool to consistently produce same outcome under similar conditions. In this study, Cronbach's Alpha Coefficient was used to evaluate reliability. Coefficient ranges from -1 to +1, where values closer to 1 signify greater internal consistency. A Cronbach's Alpha value of 0.7 will be considered the minimum acceptable threshold, with variables scoring 0.7 or higher regarded as reliable**.**

3.8 Data Collection Methods and Procedures

A structured procurement officers, supply chain managers, and IT specialists involved in e-procurement. Questionnaires include closed, open-ended questions designed to gather information about e-procurement practices, challenges, and perceived impacts. In organizations have implemented in-depth the strategic goals, obstacles e-procurement practices.

Secondary data will be of similar e-procurement implementations. This data will help contextualize the findings and provide a benchmark for analyzing. Existing performance from organizations that have adopted e-procurement will also be analyzed to examine before after implementing e-procurement systems.

3.9 Proposed Data Analysis Techniques and Procedures

Data collected from surveys analyzed using descriptive statistics trends perceptions regarding e-procurement practices. Inferential statistics used to assess relationship between independent (e-tendering, e-sourcing, invoicing, and Procurement Management Information Systems) and the dependent variable (Supply Chain Performance).

Thematic analysis will identify common patterns, challenges, and benefits adoption supply chain. Study suggests relationship between variables will follow regression model

$y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$

Wherever:

Y = supply chain performance

β0 = Constant Term

β1 - β4= Regression coefficients

X1= E- tendering

X2= E- invoicing

X3= E- sourcing

X4= Procurement Management Information Systems

ẹ= error term

3.10 Ethical considerations

Formal clearance was obtained from the Mount Kenya University Ethical Committee, along with an introduction letter from the Graduate School and the Department of Research. The researcher then applied for a research permit from NACOSTI before starting data collection. To ensure the collection of appropriate data, respondents were informed of their privacy rights and assured that their data would be used solely for educational purposes. Participation was voluntary, and respondents could choose to participate, decline, or withdraw at any stage. The researcher ensured that there was no coercion, maintained anonymity and confidentiality, and obtained informed consent. Throughout the study, academic integrity was upheld by adhering to ethical standards and properly citing previous research.

CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS AND PRESENTATION

4.0 Introduction

Summarizes outcome examining influence electronic procurement practices on operation Nairobi Metropolitan area, Kenya

4.1 Response Rate

The actual respondents who submitted completed questionnaires for data analysis were identified, and the response rate was analyzed. Table 3 shows a 100% response rate from the total sample size. During the data collection period, 179 questionnaires were distributed, all used. According to Mugenda and Mugenda (2013), a response rate of 50% is adequate for data analysis and reporting, 60% is considered good, and 70% or higher is deemed excellent.

Table 3 Response Rate

Response Rate	Frequency	Percentage
Response	179	100%
Total	179	100%

Source; Research data (2024)

4.2 Pilot Testing Results

4.2.1 Validity

Validity established by distributing to procurement managers, middle-level managers in the Nairobi Metropolitan area, Kenya. Responses from procurement managers were reviewed in relation to study's objectives and scale from 5 (Strongly Agree) to 1 (Strongly Disagree). Validity index was calculated

using SPSS by expert to generated reports. Questionnaires were numbered from 1 to 179, corresponding data received from respondents for specified data types collected**.**

4.2.2 Reliability Analysis

The reliability of the data collection was measured using Cronbach's alpha, with calculations performed through SPSS. A pilot study was conducted involving 8 top managers and 10 middle managers responsible for procurement in the Nairobi Metropolitan area, who provided feedback on the questionnaires. According to Zinbarg (2005), Cronbach's alpha is a reliability coefficient that estimates data generalizability. Table 4 shows that the data was reliable, with Cronbach's alpha values for electronic tendering, electronic material management, and electronic invoicing being 0.815, 0.757, and 0.843, respectively. An alpha coefficient greater than 0.60 indicates high internal consistency, allowing generalization of the findings to the target population.

Table 4 Reliability Results

Constructs	Cronbachs Alpha Values	Comments
Electronic tendering	0.815	Accepted
Electronic material management practices	0.757	Accepted
Electronic invoicing	0.843	Accepted

Source; Research data, (2024)

4.3 General Information

This section contains respondents' demographic information, including gender, education level, and position. Additionally, it explores process of digital procurement as understood by managers**.**

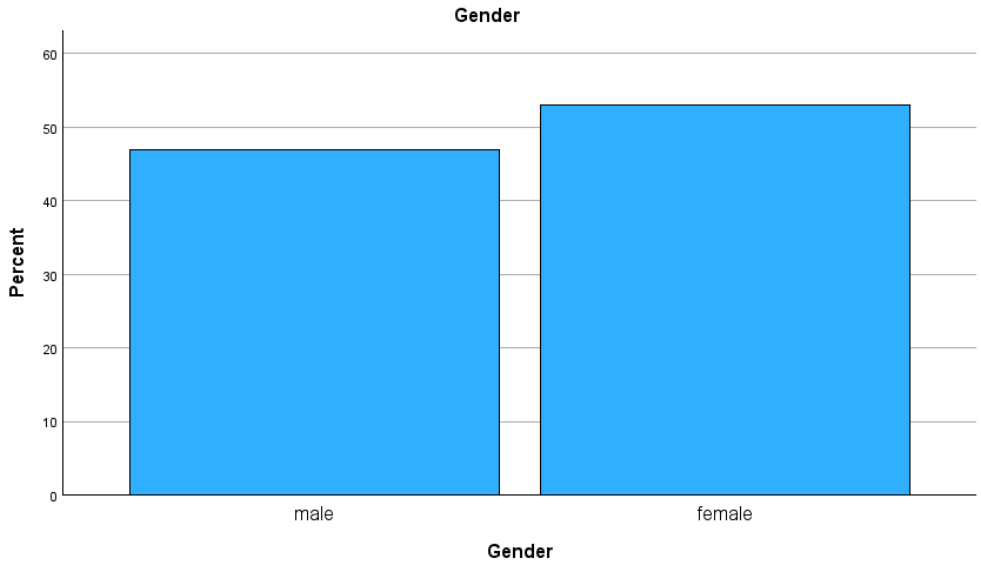
4.3.1 Gender of Respondents

Table 5 Gender distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	84	46.9	46.9	46.9
	female	95	53.1	53.1	100.0
	Total	179	100.0	100.0	

Source: Research data, 2024

Figure 2 Gender groups of participants



Out of total 179 respondents, 84 were male, representing 46.9% of sample, while 95 were female, making up 53.1% of sample. Gender distribution indicates participation, predominance of female (53.1%) and male (46.9%). ensures diversity in the sample and provides a broad perspective on the research topic.

4.3.2 Education Level

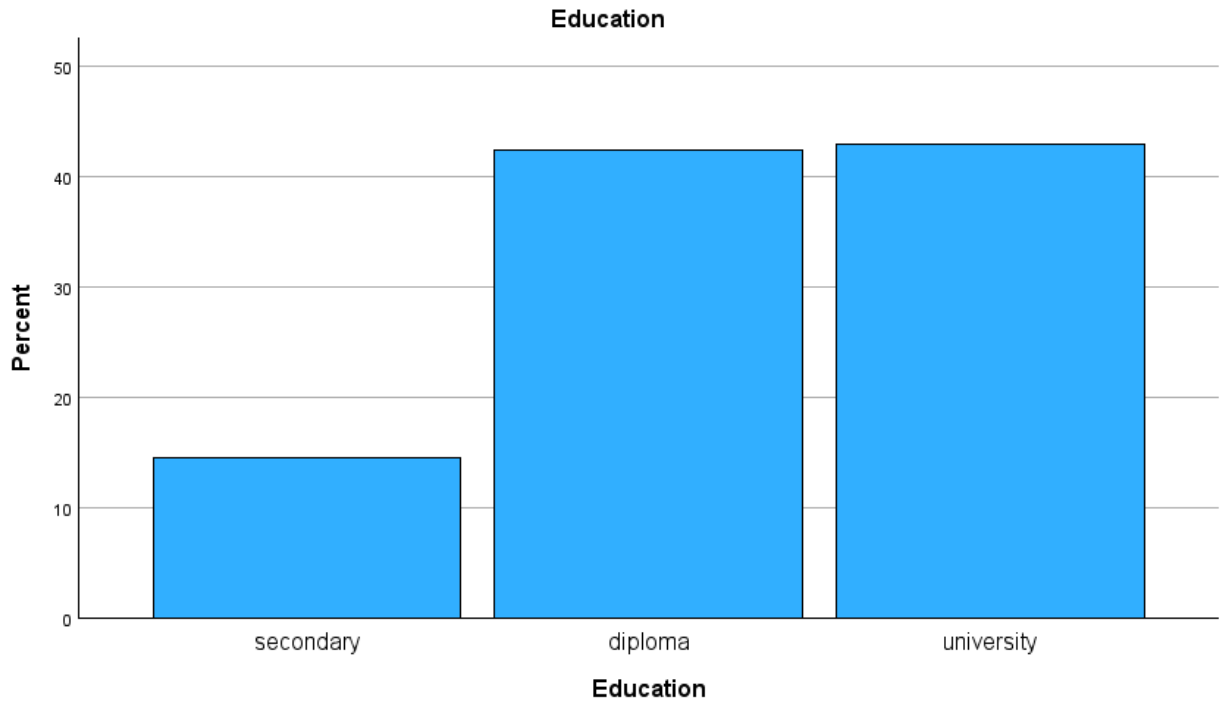
Table 6 Education Level

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	secondary	26	14.5	14.5	14.5
	diploma	76	42.5	42.5	57.0
	university	77	43.0	43.0	100.0
	Total	179	100.0	100.0	

Source: Research data, 2024

Figure 3 Level of Education for participants



Employed by Nairobi metropolitan to undertake procurement process and interviewed are 14.5% had secondary level, 42.5% had Diploma and 43.0% university graduates. This implied that most of employees tasked with procurement have skills that are required to perform procurement duties.

4.3.3 Employment status of respondents

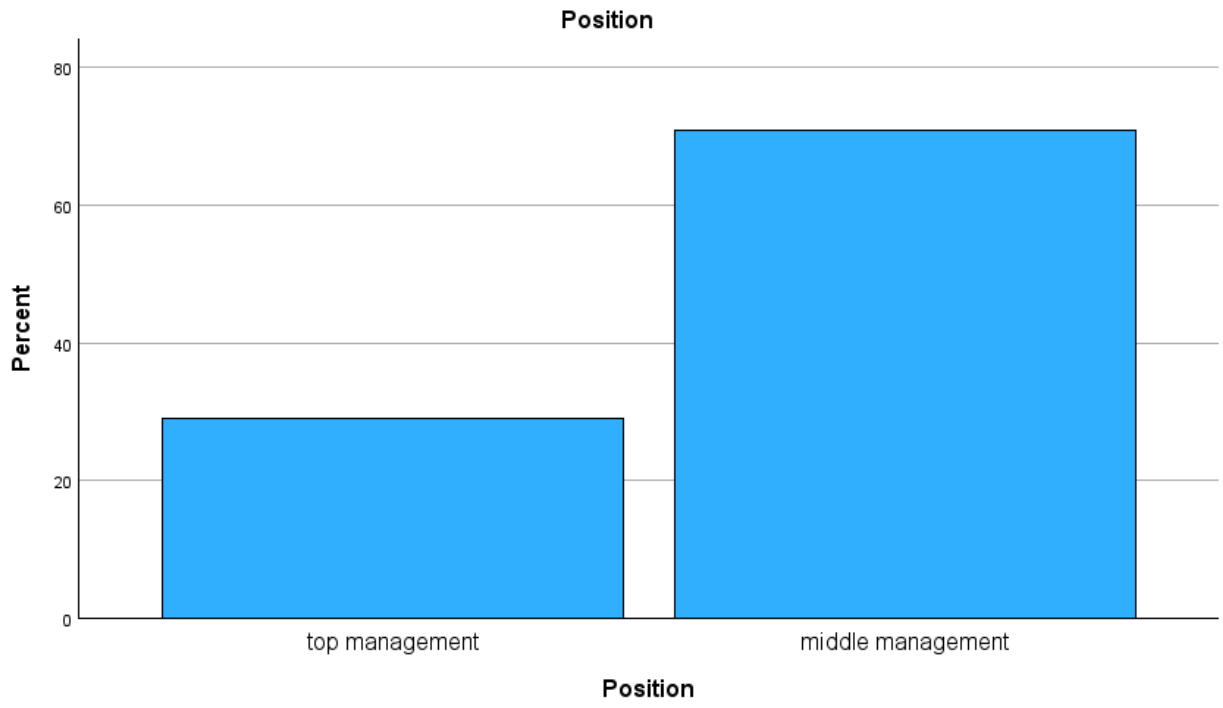
Table 7 Employment status

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	top management	52	29.1	29.1	29.1
	middle management	127	70.9	70.9	100.0
	Total	179	100.0	100.0	

Source: Research data, 2024

Figure 4 Position for participants



Position hold by Nairobi metropolitan to undertake procurement process and interviewed are 29.1 top management and 70.9 middle level managers. This implied that most of employees tasked with procurement process are top and middle level managers that understand procurement duties.

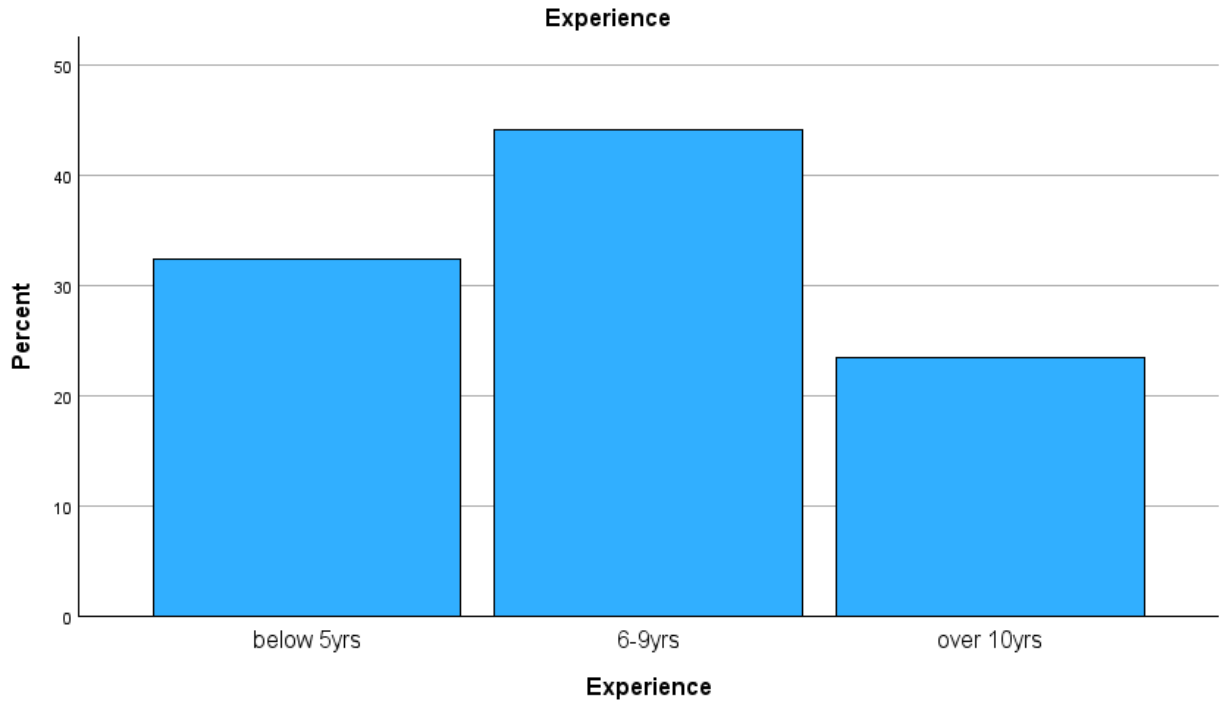
4.3.4 Experience level

Table 8 Experience

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	below 5yrs	58	32.4	32.4	32.4
	6-9yrs	79	44.1	44.1	76.5
	over 10yrs	42	23.5	23.5	100.0
	Total	179	100.0	100.0	

Figure 5 Experience for participants



The data shows that largest proportions of respondent fall into 6-9 years category with 44.1%, which suggests that significant number of individuals, are middle level experience in an organization. 32.4% of participant has below 5years of experience, showing those employees are new in organization. 23.5% have over 10years of experience, indicating that quarter of the population has significant experience in the organization. According to analysis shows that Nairobi metropolitan have 76.5% of employees who are not experience in the organization and that may cause them a lot with their customers.

4.4 Descriptive statistics with regard to variables under study

Section presents on electronic tendering, electronic material management practices, and electronic

invoicing. The results are displayed values deviations.

4.4.1 Electronic Tendering and Organization Performance

Table 9: electronic tendering

statement	SD	D	N	A	SA	mean	std
Electronic tendering improves transparency within the organization.	0.6 %	5.5 %	33.5 %	35.8 %	24.6 %	3.79	.901
Electronic tendering helps reduce costs associated with the traditional tendering process, thus enhancing supply chain performance.	0.0	3.9	24.0	41.3	30.7	3.99	.841
Electronic tendering increases the speed of the entire tendering process, thereby improving supply chain performance within the organization.	0.0	1.7	17.9	43.6	36.9	4.16	.770
Adopting electronic tendering helps standardize the buying process across the organization's supply chain management	0.0	1.1	23.5	45.3	30.2	4.04	.763
The e-tendering process reduces the potential for manual errors in the organization’s supply chain management.	1.1	1.1	17.9	57.0	22.9	3.99	.746

Source: Research Data, (2024)

Electronic tendering process enables the organization to improve transparency (Mean: 3.79, Standard Deviation**:** 0.901). A majority of respondents (35.8% Agree, 24.6% Strongly Agree) believe that electronic tendering improves transparency. The relatively high mean value (3.79) indicates a strong perception of the positive impact of electronic tendering on transparency. Electronic tendering helps reduce costs associated with traditional tendering processes, thereby enhancing supply chain performance. (Mean: 3.99, Standard Deviation**:** 0.841) With 41.3% Agree and 30.7% Agree, 3.99, reflecting

positive outlook cost reduction its effect on supply chain performance. Respondents see electronic tendering as a cost-effective solution for improving performance. Electronic tendering increases the speed of the entire tendering process, thereby enhancing the organization's supply chain performance. (Mean: 4.16, Standard Deviation: 0.770) highest mean (4.16) indicates that respondents strongly believe electronic tendering accelerates the tendering process. With 43.6% Agree and 36.9% Strongly Agree, this result shows that the speed of the process is a key benefit of electronic tendering, positively influencing electronic the organization (Mean: 4.04, Standard Deviation: 0.763) majority of respondents (45.3% Agree, 30.2% Strongly Agree) believe that electronic tendering leads to standardization. The mean value of 4.04 suggests that respondents view the adoption of electronic tendering as a critical factor in standardizing procurement processes, improving consistency across the organization. For organization (Mean: 3.99, Standard Deviation: 0.746) with 57.0% Agree and 22.9% Strongly Agree, respondents generally agreed that electronic tendering minimizes manual errors in the procurement process. The mean of 3.99 confirms that the reduction of errors is a key advantage of the electronic system

Advent digital technologies internet, cloud computing, and software automation revolutionized procurement practices. These technologies enabled the development of e-procurement systems that could automate and streamline procurement processes.

Kamotho (2014) noted that e-tendering, the process of conducting tenders through electronic means, has significantly transformed procurement practices by introducing greater efficiency, transparency, and accessibility. By utilizing digital platforms, organizations can streamline the tendering process. E-tendering allows for broader participation from suppliers, leading to increased competition and potentially better pricing. automation tender-related tasks minimizes human error, ensures compliance with procurement regulations, and provides a clear audit trail, enhancing reducing informed and strategic decisions, ultimately improving their procurement outcomes.

Gathima and Njoroge (2018) also argued that extends beyond cost savings and efficiency gains. By fostering a more competitive and transparent procurement environment, e-tendering helps organizations build stronger relationships with suppliers. These improved relationships can lead to better terms, higher quality supplies, and more reliable delivery schedules, all of which contribute to smoother operations and higher overall performance. Additionally, the data collected through e-tendering platforms can analyze procurement trends, supplier areas for procurement aligning them more closely with their broader organizational goals and driving sustained performance improvements. Tendering is an e-procurement practice where potential bidders submit binding proposals detailing the price and terms for providing specific goods, works, or services. Once accepted, the proposal forms the basis of the contract (Lyons & Farrington, 2006). In Kenya, tender notices are widely disseminated through print and electronic media, with a 14-day period for bidders to obtain bid documents, either from public organizations or via websites. Tender information is accessible through the Public Procurement Information Portal (PPIP), which provides details on procuring firms, vendors, bid notices, and awarded contracts. Entities must upload information to the PPIP monthly, typically by the 15th.

The Government Tenders Opportunities website also highlights tenders reserved for women, youth, and persons with disabilities, while individual public procurement entities post opportunities on their own websites. Government tenders below specific thresholds are often posted on notice boards at public offices and local government centers.

Auditor General's report on public procurement, tendering process tendering, Tendering, award. An analysis of procurement violations in the Ministry of Education between 2013/14 and 2015/16 revealed that most violations (63%) occurred during the post-award stage, with 29% during the tendering phase, and the rest in the pre-tendering phase.

Table 10 Electronic Tendering and Organization Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.274[a]	.075	.049	.815

a. a. Predictors: (Constant), electronic tendering
b. Dependent variables: organization performance

Source: Research Data, (2024)

R value 0.274 indicates weak positive correlation between electronic tendering and organizational performance. This suggests that electronic tendering has influence on performance. R Square value 0.075 shows that electronic tendering explains 7.5% of variation in organizational performance, with remaining 92.5% influenced by other factors not captured in this model. Adjusted R Square value of 0.049 further refines this estimate, indicating that only 4.9% of variance in performance is explained when adjusting for predictors. This suggests model could benefit from inclusion of additional independent variables. Standard error of 0.815 reflects average deviation between observed and predicted values; a lower value would indicate a better model fit, whereas this relatively high value implies limited predictive precision.

Table 11 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.348	5	1.870	2.816	.018[b]
	Residual	114.842	173	.664		
	Total	124.190	178			

a. Dependent Variable: organization performance
b. Predictors: (Constant), Electronic tendering

Source: Research Data, (2024)

The analysis of variance (ANOVA) results presented in Table 11 indicate a statistically significant relationship between electronic tendering and organizational performance, as evidenced by a p-value of 0.05. This means that the model used to examine the relationship between the independent variable (electronic tendering) and the dependent variable (organizational performance) is valid and the findings are statistically meaningful at the 5% significance level.

Table 12 Regression coefficients on the influence of electronic tendering on organization performance.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.690	.436		6.177	<.001
	Electronic tendering improves transparency within the organization.	.095	.086	.102	1.107	.270
	Electronic tendering helps reduce costs associated with the traditional tendering process, thus enhancing supply chain performance.	.045	.091	.045	.492	.623
	Electronic tendering increases the speed of the entire tendering process, thereby improving supply chain performance within the organization	.040	.104	.037	.382	.703
	Adopting electronic tendering helps standardize the buying process across the organization's supply chain management.	.187	.102	.171	1.838	.068

	The e-tendering process reduces the potential for manual errors in the organization's supply chain management.	-.063	.089	-.056	-.703	.483

a. Dependent Variable: organization performance

The regression coefficient results in Table 12 indicate a statistically significant relationship between electronic tendering and organizational performance, as shown by the p-value of 0.05. This confirms that electronic tendering has a meaningful impact on organizational performance. Furthermore, the Beta value of 0.301 suggests that a one-unit increase in electronic tendering is associated with a 0.301 unit improvement in organizational performance, specifically in the context of supply chain performance in Kenya.

4.4.2 Electronic Material Management Practices and Organization Performance

Analyzes effect electronic material. Table 13 presents summary the findings.

Table 13 Electronic Material Management Practices

Statement	SD	D	N	A	SA	mean	std
The firm's stock levels are enhanced through the use of electronic Material Management practices.	0.6	4.6	17.9	53.1	24.0	3.96	.806
EMM can lead to significant improvements in transportation and logistics within the organization	0.0	0.6	28.5	32.4	38.5	4.09	.830
With EMM, the company can reduce capital expenses by minimizing idle stock, ensuring that goods supplied meet customer demands	0.0	3.4	20.1	41.9	34.6	4.08	824
Electronic Material Management practices eliminate the duplicate handling of materials	0.0	1.1	20.1	48.0	30.7	4.08	.741

within the company's supply chain							
Electronic Material Management practices help the company acquire the right types and quantities of materials in the first place.	0.0	5.0	11.7	53.6	29.6	4.08	.782

Source: Research data, 2024

The firm's stock levels are enhanced through the use of electronic material management practices (Mean: 3.96, Standard Deviation: 0.806) majority of respondents (53.1% Agree, 24.0% Strongly Agree) believe that electronic material management practices improve the firm's stock levels. The mean value of 3.96 suggests a strong positive perception of the impact of electronic material management on stock levels. EMM can make great improvements on transportation and logistics in the organization (Mean: 4.09, Standard Deviation: 0.830) with 38.5% Strongly Agree and 32.4% Agree, this statement had the highest mean score of 4.09, indicating a strong belief that electronic material management (EMM) significantly improves transportation and logistics in the organization.

With EMM, the company can reduce capital expenses by ensuring there is no idle stock, and goods supplied meet customer demands (Mean: 4.08, Standard Deviation: 0.824) respondents (41.9% Agree, 34.6% Strongly Agree) perceive EMM as an effective tool in reducing capital expenses by managing stock levels more efficiently. The mean of 4.08 reflects a positive view on the financial benefits of EMM in reducing idle stock and meeting demand. Electronic material management practices eliminate duplicate handling of materials within the company's supply chain (Mean: 4.08, Standard Deviation: 0.741) with 48.0% Agree and 30.7% Strongly Agree, respondents believe that EMM reduces redundant handling of materials, which can enhance supply chain efficiency. The mean value of 4.08 shows strong agreement on this benefit of EMM. Electronic material management practices enable the company to facilitate the right type and quantities acquired in the first place (Mean: 4.08, Standard

Deviation: 0.782) respondents (53.6% Agree, 29.6% Strongly Agree) believe that EMM helps in acquiring the right materials in the correct quantities. The mean of 4.08 suggests a strong perception of EMM's role in optimizing procurement. Research findings from Table 13 indicate that the majority of respondents held a positive view on the statements, with most agreeing with the points presented, as reflected in the percentages above. In e-procurement generates for network. These integrate automating the billing process. E-procurement revenues typically come from transaction fees. Effective pricing models like Fixed Pricing and Dynamic Pricing allow better help manage.

Fixed is based on predetermined catalog or negotiated prices, while Dynamic Pricing lets market forces determine the price, such as in reverse auctions or exchanges.

Billing management improves requisition, invoicing, and payment accuracy by automating processes and using electronic documentation, thus reducing transaction costs.

Siemsen et al. (2008) despite mandatory may bypass e-procurement provisions. While some studies highlight e-procurement's role in improving accountability, Subramaniam and Shaw (2002) note that it enhances price setting and billing management. However, others caution that merely implementing e-procurement doesn't guarantee compliance, as user perceptions of the system can affect contract adherence (Turban et al., 2006).

The electronic businesses send receive invoices (Brun, 2008). Hernandez-Ortega (2011), businesses capture transaction data and transmit it over a network, enhancing the management of across. It also strengthens transactions.

Several observation underscored benefits. Chegugu and Yusuf (2017) examined it's on public hospitals in Uasin Gishu County, Kenya, surveying 367 respondents across five hospitals. Their

findings indicated that e-invoicing significantly enhanced procurement efficiency by improving supplier charge tracking. However, the study had empirical gaps, notably its exclusion of e-sourcing, e-payment, and e-tendering, as well as its limited focus beyond hospitals.

Similarly, Waganda (2018) investigated e-procurement in United Nations agencies in Nairobi and found that e-invoicing positively influenced procurement performance by reducing costs, accelerating payments, and improving data security. Yet, this study also did not address other e-procurement components or focus on SMEs within Nairobi City County.

Both studies contribute to the understanding of e-invoicing's role in procurement, but there are contextual and empirical gaps, particularly in relation to the inclusion of SMEs and the absence of practices sourcing, e-tendering.

Table 14 Regression between Electronic Material Management Practices and Organization Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.544[a]	.296	.276	.757

a. Predictors: (Constant), Electronic Material Management Practices
b. Dependent variables: organization performance

Source: research data, (2023)

Electronic Material Management Practices affects organization performance on supply chain in Kenya by R value (0.544) represents the correlation between EMM **practices** and organizational performance. This indicates a moderate positive relationship, suggesting that as EMM practices

improve, organizational performance tends to improve as well. Compared to a weak correlation (e.g., R = 0.274 in your previous analysis), this moderate relationship suggests that EMM practices are more influential in enhancing organizational performance than electronic tendering. This suggests that EMM practices play a significant role in determining organizational performance, though other factors (70.4%) not included in this model also contribute to performance. Compared to the previous model (R^2 = 0.075 for e-tendering), EMM practices have a much stronger impact on performance. The Adjusted R Square (0.276) slightly reduces explanatory power. Means that after adjusting for possible overestimation, 27.6% of variation organizational still EMM. Since reduction from R^2 (0.296) to Adjusted R^2 (0.276) is small be stable. Standard Error Estimate (0.757) and 0.757 is relatively moderate suggesting that the model's predictions are fairly accurate but still have some degree of error. Compared to the previous model (SE = 0.815), this model is slightly more precise in predicting organizational.

Table 15 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.669	5	8.334	14.555	<.001[b]
	Residual	99.057	173	.573		
	Total	140.726	178			

a. Dependent Variable: organization performance
b. Predictors: (Constant), Electronic Material Management Practices

Source: research data; (2024)

ANOVA results in Table 15 showed that the model was suitable for analyzing the relationship between the independent and dependent variables. The p-value (p = 0.000) was below the 0.05 threshold, indicating a significant relationship between electronic material management practices and organizational performance in Kenya's supply chain.

Table 16 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.923	.410		2.253	.026
	The firm's stock levels are enhanced through the use of electronic Material Management practices.	-.018	.084	-.017	-.220	.826
	EMM can lead to significant improvements in transportation and logistics within the organization.	.371	.088	.346	4.189	<.001
	With EMM, the company can reduce capital expenses by minimizing idle stock, ensuring that goods supplied meet customer demands.	.114	.092	.105	1.235	.218
	Electronic Material Management practices eliminate the duplicate handling of materials within the company's supply chain.	.138	.091	.115	1.514	.132
	Electronic Material Management practices help the company acquire the right types and quantities of materials in the first place.	.158	.081	.139	1.963	.051

a. Dependent Variable: organization performance

The findings in Table 16 confirmed a statistically significant relationship between electronic material management practices and organizational performance in Kenya's supply chain. The p-value ($p = 0.000$) was below 0.05, indicating significance. Additionally, the Beta value of 0.688 suggested that a unit change in electronic material management practices would lead to a 0.688-unit improvement in

supply chain performance.

4.4.3 Responses on Electronic Invoicing and Organization Performance

The study establishes effect of electronic invoicing and organization performance.

Table 17: ***Responses on Electronic Invoicing and Organization Performance***

statement	SD	D	N	A	SA	Mean	std
The cost of procurement transactions is reduced through electronic invoicing	2.8	6.1	22.3	40.2	28.5	3.85	.995
Electronic invoicing can lead to significant improvements in transportation and logistics within the organization	1.1	1.7	31.8	34.6	30.7	3.92	.890
Electronic invoicing speeds up communication regarding procurement processes within the organization	0.0	2.2	22.3	39.1	36.3	4.09	.819
The reliability of service delivery is improved through electronic invoicing, thereby enhancing overall organizational performance.	0.6	3.4	15.6	54.7	25.7	4.02	.775

Source: Research data, (2024)

"The cost of procurement transaction reduced through electronic invoicing (Mean: 3.85, Std Dev: 0.995) majority agreed (40.2%) or strongly agreed (28.5%) that electronic invoicing reduces procurement transaction costs. The mean (3.85) suggests a positive leaning, close to agreement. The standard deviation is moderately high, indicating some variability in responses possibly due to differing experiences or levels of implementation across respondents. organization (Mean: 3.92, Std

Dev: 0.890) clear majority either agreed (34.6%) or strongly agreed (30.7%), indicating strong belief in the indirect benefits of e-invoicing on logistics. mean (3.92) is notably high, indicating a positive perception. A relatively lower standard deviation shows more consistency in responses. (Mean: 4.09, Std Dev: 0.819) statement received the highest agreement, with 39.1% agreeing and 36.3% strongly agreeing. The standard deviation is the lowest, consensus. Electronic invoicing reliability service delivery thereby ensuring improved organization performance (Mean: 4.02, Std Dev: 0.775) majority (54.7%) agreed and 25.7% strongly agreed, highlighting a strong belief in the reliability and performance-enhancing aspects of e-invoicing. The lowest standard deviation of all statements suggests this is the most unanimously agreed point.

Hunsinger (2015) highlights role of e-procurement in identifying, evaluating, and negotiating with suppliers, as well as building strong supplier and customer relationships, ultimately aiding organizational performance. The goal services at the lowest total cost while achieving organizational objectives (Chitungo & Munongo, 2013). It enhances knowledge within an organization and trains staff on such as times, allows to identify new suppliers across spatial boundaries (Lu, 2015). This process increases competition and reduces risks in spend categories (Williams & Wynn, 2015).

Carlisle, (2006) on adoption Northern Ireland's construction industry found that e-procurement was driven by improvements in communication and cost reductions through IT, while barriers were linked to security and legal concerns. Kamotho (2014) explored e-procurement adoption in Kenyan government agencies, revealing that many state corporations had adopted e-procurement practices, which positively impacted procurement performance. Similarly, Ateto, Ondieki, and Okibo (2013) evaluated how e-procurement systems improved efficiency and value for money in public hospitals, specifically Kisii Level 5 Hospital, identifying poor change management.

Further, Dzama and Matavire (2013) investigated the adoption of e-procurement at CBZ Bank in Zimbabwe, focusing on strategic sourcing and the factors influencing adoption, including financial stability, cost, and strategic factors. They concluded that strong management support was crucial for effective adoption and the realization of strategic benefits.

Idrees et al. (2022) argue that e-sourcing involves using internet technology to identify potential suppliers for specific spending categories, enhancing competition among suppliers and improving organizational performance (Ribeiro & Henriques, 2011). Songip et al. (2013) further define e-sourcing as the process of creating, approving, and placing orders for goods and services via software systems based on internet technology, which boosts organizational performance. E-sourcing primarily focuses on indirect goods and services, those not directly related to the final product (Van Weele, 2010). These systems, such as ordering catalogs, are used throughout the organization, while enterprise resource planning systems manage direct goods and services, often requiring planned ordering (Salford & Roche, 2010).

Electronic ordering solutions streamline repetitive manual processes, reduce paperwork, lower costs, increase productivity, and improve customer service, thereby enhancing performance (Porter & Millar, 2015). Mentzer (2010) notes that online ordering systems enable customers to place orders through a company's website, which can boost sales by providing convenient home access (Minahan & Degan, 2011). Beyond facilitating transactions, e-sourcing also improves workflows, enhances flexibility, and fosters transparency in buyer-seller relationships, promoting better negotiations and creating richer arbitrage opportunities (Moon, 2015; Wong & Sloan, 2014).

E-sourcing also allows purchasing teams to focus on strategic activities, such as developing supply bases, managing supplier relationships, integrating suppliers into innovation processes, and

restructuring value chains (Songip et al., 2013). Issa et al. (2013) found that e-sourcing helps identify suitable suppliers, ensuring the receipt of high-quality goods and services. While electronic sourcing reduces coordination and search costs in some contexts (Mentzer, 2010).

Table 18 Regression between Electronic Invoicing and Organization Performance
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.468[a]	.219	.201	.843

a. Predictors: (Constant), Electronic Invoicing
b. Dependent Variable: organization performance

Source: Research data, (2024)

This is because the R value (0.468) indicates Electronic Invoicing (EI) organizational suggests implementing electronic invoicing positively influences organizational performance, but the relationship is not extremely strong. Compared to the previous models (e.g., R = 0.544 for Electronic Material Management), EI has a weaker correlation with organizational performance, implying that while EI contributes to performance, other factors may have a greater impact. R Square value (0.219) means that 21.9% of the variation in organizational performance is explained by electronic invoicing. This indicates that while EI plays a role in enhancing efficiency, reducing errors, and improving financial processes, 78.1% of organizational performance variations remain unexplained by this model. This suggests that other factors such as procurement efficiency, supplier relationships, and operational strategies also significantly influence organizational performance. Adjusted R Square (0.201) is slightly lower than R Square (0.219), indicating a slight reduction in explanatory power when adjusting for model complexity. This means that after considering adjustments, about 20.1% of organizational performance variations can still be attributed to electronic invoicing. Since the drop from R Square to Adjusted R Square is minimal, this suggests that the model is relatively stable and

reliable, but further improvements can be made by including additional predictors.

Table 19 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.761	4	8.690	12.216	<.001[b]
	Residual	123.775	174	.711		
	Total	158.536	178			

a. Dependent Variable: organization performance

b. Predictors: (Constant), Electronic Invoicing

The ANOVA results in Table 19 indicate a significant relationship between the independent variable, electronic invoicing, and the dependent variable, organizational performance in the supply chain in Kenya. This is supported by a p-value of 0.000, which is less than the significance level of 0.05. These findings confirm that the model used to examine the relationship between the variables was appropriate and statistically reliable.

Table 20 Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.330	.444		2.993	.003
	The cost of procurement transactions is reduced through electronic invoicing	.217	.075	.229	2.904	.004
	Electronic invoicing can lead to significant improvements in transportation and logistics within the organization.	.208	.087	.196	2.396	.018
	Electronic invoicing speeds up communication regarding procurement processes within the organization.	.127	.096	.110	1.319	.189

	The reliability of service delivery is improved through electronic invoicing, thereby enhancing overall organizational performance.	.154	.086	.126	1.790	.075

a. Dependent Variable: organization performance

The regression results in Table 20 showed a statistically significant relationship between electronic invoicing and organizational performance, as the p-value (p = 0.000) was below the 0.05 threshold. This indicates that the variables were statistically related. Furthermore, the Beta value of 0.661 suggested that a unit change in service efficiency through electronic invoicing would lead to a 0.661-unit improvement in supply chain performance.

4.4.4 Responses on Performance of the Organization

Table 21 Is a summary of these finding

Statement	SD	D	N	A	SA	Mean	std
There is increased adherence to processes and procedures in relation to procurement	1.7	1.7	25.1	48.0	23.5	3.90	.835
The organization is producing better quality products and services.	1.1	2.8	22.8	38.5	35.2	4.04	.889
Procurement planning has significantly improved	2.2	4.5	12.3	41.3	39.7	4.12	.944
Better procurement benchmarks have been established	2.2	3.4	15.6	38.5	40.2	4.11	.944
Procurement integrity and transparency have been enhanced	1.1	1.1	19.0	41.3	37.4	4.13	.835

The overall performance of the organization has generally improved.	2.2	1.1	11.7	52.5	32.4	4.12	.823

Source: Research data, 2024

Respondents agreed that increased adherence to processes and procedures in relation to procurement (mean 3.0, Std .835). The respondent also agreed that (mean 4.04, Std .889). The respondent agreed that the Procurement planning has significantly improved (mean 4.12, Std .944). Most respondents strongly agreed that better procurement benchmarks have been set up (mean 4.11, Std .941). The respondent also agreed that (mean 4.13, Std .835).Most respondents agreed with the the overall performance has generally improved (mean 4.12, std .823).

This data helps organizations optimize system performance, analyze growth patterns, and adapt to market or technical needs. Continuous monitoring of system security and traffic is crucial to prevent breakdowns, security issues, scalability problems, and poor marketplace performance caused by inefficient transaction engines.

Aberdeen, (2011), systems have delivered significant benefits, including a 70%-80% reduction in requisition-to-fulfillment cycles, a 73% reduction in administrative costs, a 5%-10% decrease in material prices, halved off-contract buying, and a 25%-50% reduction in inventory costs. System management these achievements automating validation electronic proposals, allowing suppliers to receive immediate feedback. Moreover, modern e-procurement systems automate processes such as order creation, approval routing, order transmission to vendors, invoicing, and payments, significantly reducing effort and time.

E-procurement systems also drive substantial financial savings. For example, the Bank of Ireland saved within and improvements. Alcoa Inc., a major aluminum producer, adopted e-procurement in 1999 to reduce operating resource costs and integrate supplier relationships.

By leveraging tools like the internet and intranet, organizations can automate their procurement processes, which reduces time-to-market, minimizes inventory, and lowers costs associated with capital assets, such as storage and taxes. Dell, for instance, emphasizes the importance of linking updated daily demand with inbound supply flows to optimize inventory management and achieve "virtual integration" (Dell, 1999).

4.5 Inferential Statistics

A multiple regression model was applied to assess the relative contribution of each independent variable to organizational performance in Kenya's supply chain sector. The model was structured as follows:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ... + \beta_n X_n + \varepsilon}$$

Where:

- **Y** = Organizational performance on supply chain
- β_0 = Intercept
- $\beta_1 ... \beta_n$ = Coefficients of the independent variables
- $X_1 ... X_n$ = Independent variables (e.g., electronic tendering, electronic material management, electronic invoicing, etc.)
- ε = Error term

4.5.1 Model Summary

The Adjusted R^2, also known as the coefficient of determination, indicates the proportion of variance in organizational performance that can be explained by changes in the independent variables. In this study, it shows how organizational performance is influenced by electronic tendering, electronic material management practices, and electronic invoicing. A higher Adjusted R^2 value suggests that these variables collectively have a strong explanatory power on supply chain performance in Kenya.

Table 22 Multiple Regression between Independent variables and organization performance.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.411[a]	.169	.165	.860
2	.475[b]	.226	.217	.833
3	.496[c]	.246	.233	.825
4	.517[d]	.267	.250	.815

a. Predictors: (Constant), Electronic tendering, Electronic material management practices and Electronic invoicing

Source: Research Data, (2024)

The estimated model indicated that the three variables explain 90.8% of the variation in organizational performance on the supply chain in Kenya. This suggests that these variables are highly significant in determining supply chain performance, with a large portion of the variance accounted for by electronic tendering, electronic material management practices, and electronic invoicing.

4.5.2 ANOVA

Table 23 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.705	1	26.705	36.066	<.001[b]
	Residual	131.060	177	.740		
	Total	157.765	178			

a. Dependent Variable: organization performance
b. Predictors: (Constant), Electronic tendering, Electronic material management practices and Electronic invoicing

Table 23 shows that the independent variables (Electronic tendering, Electronic material management practices and Electronic invoicing) statistically significantly predict the dependent variable, F (1, 177) = 36.070, P=0.05.

4.5.3 Regression Coefficients

B1 = 0.197 indicates that holding other variables constant, a unit increase in Electronic tendering will lead to 0.197 increase in organization performance.

B2 = 0.202 indicates that holding other variables constant, a unit increase in Electronic invoicing will lead to 0.202 increase in organization performance.

B3 = 0.298 indicates that holding other variables constant, a unit increase in electronic material management practices will lead to 0.298 increase in organization performance.

Table 24 Regression Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B

		B	Std. Error	Beta			Lower Bound	Upper Bound
3	(Constant)	1.292	.380		3.405	<.001	.543	2.042
	Electronic material management practices	.298	.085	.262	3.494	<.001	.130	.466
	Electronic invoicing	.202	.081	.191	2.486	.014	.042	.363
	Electronic tendering	.197	.093	.172	2.134	.034	.015	.380

a. Dependent Variable: organization performance

Source: Researcher (2024)

Summative Regression Analysis

The established multiple linear regression equation becomes:

$Y= 1.292 + 0.197X_1 + 0.202X_2 + 0.\ 298X_3$

Where

Y = organization performance

Constant = 1.292

Electronic tendering = 0.197

Electronic invoicing = 0.202

Electronic material management practice = 0.298

It is clear from the study findings that organization performance influenced by electronic tendering. The electronic material management practice has the greatest influence followed by electronic invoicing and the least is electronic tendering.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

It encapsulates key findings, draws conclusions based on data analyzed, offers practical recommendations for improving organizational performance in the supply chain, and suggests areas for further exploration to deepen understanding or address gaps in current research.

5.2 Summary of the Findings

Management practices electronic procurement to ease their organization performance. Specifically, established adopting the electronic tendering, electronic invoicing and electronic material management practices on overall performance of supply chains within the Nairobi Metropolitan area.

5.2.1 Effect of electronic tendering on organization performance

Electronic tendering process enables the organization to improve transparency (Mean: 3.79, Standard Deviation**:** 0.901). A majority of respondents (35.8% Agree, 24.6% Strongly Agree) believe that electronic tendering improves transparency. The relatively high mean value (3.79) indicates a strong perception of the positive impact of electronic tendering on transparency. Electronic tendering helps reduce costs associated with traditional tendering processes, thereby enhancing supply chain performance. (Mean: 3.99, Standard Deviation**:** 0.841) With 41.3% Agree and 30.7% Agree, 3.99, reflecting positive outlook cost reduction its effect on supply chain performance. Respondents see electronic tendering as a cost-effective solution for improving performance. Electronic tendering increases the speed of the entire tendering process, thereby enhancing the organization's supply chain performance. (Mean: 4.16, Standard Deviation: 0.770) highest mean (4.16) indicates that respondents strongly believe electronic tendering accelerates the tendering process. With 43.6% Agree and 36.9% Strongly Agree, this result shows that the speed of the process is a key benefit of electronic tendering, positively influencing

electronic the organization (Mean: 4.04, Standard Deviation: 0.763) majority of respondents (45.3% Agree, 30.2% Strongly Agree) believe that electronic tendering leads to standardization. The mean value of 4.04 suggests that respondents view the adoption of electronic tendering as a critical factor in standardizing procurement processes, improving consistency across the organization. For organization (Mean: 3.99, Standard Deviation: 0.746) with 57.0% Agree and 22.9% Strongly Agree, respondents generally agreed that electronic tendering minimizes manual errors in the procurement process. The mean of 3.99 confirms that the reduction of errors is a key advantage of the electronic system

Advent digital technologies internet, cloud computing, and software automation revolutionized procurement practices. These technologies enabled the development of e-procurement systems that could automate and streamline procurement processes.

Kamotho (2014) noted that e-tendering, the process of conducting tenders through electronic means, has significantly transformed procurement practices by introducing greater efficiency, transparency, and accessibility. By utilizing digital platforms, organizations can streamline the tendering process. E-tendering allows for broader participation from suppliers, leading to increased competition and potentially better pricing. automation tender-related tasks minimizes human error, ensures compliance with procurement regulations, and provides a clear audit trail, enhancing reducing informed and strategic decisions, ultimately improving their procurement outcomes.

Gathima and Njoroge (2018) also argued that extends beyond cost savings and efficiency gains. By fostering a more competitive and transparent procurement environment, e-tendering helps organizations build stronger relationships with suppliers. These improved relationships can lead to better terms, higher quality supplies, and more reliable delivery schedules, all of which contribute to smoother operations and higher overall performance. Additionally, the data collected through e-tendering platforms can analyze procurement trends, supplier areas for procurement aligning them

more closely with their broader organizational goals and driving sustained performance improvements. Tendering is an e-procurement practice where potential bidders submit binding proposals detailing the price and terms for providing specific goods, works, or services. Once accepted, the proposal forms the basis of the contract (Lyons & Farrington, 2006). In Kenya, tender notices are widely disseminated through print and electronic media, with a 14-day period for bidders to obtain bid documents, either from public organizations or via websites. Tender information is accessible through the Public Procurement Information Portal (PPIP), which provides details on procuring firms, vendors, bid notices, and awarded contracts. Entities must upload information to the PPIP monthly, typically by the 15th.

The Government Tenders Opportunities website also highlights tenders reserved for women, youth, and persons with disabilities, while individual public procurement entities post opportunities on their own websites. Government tenders below specific thresholds are often posted on notice boards at public offices and local government centers.

Auditor General's report on public procurement, tendering process tendering, Tendering, award. An analysis of procurement violations in the Ministry of Education between 2013/14 and 2015/16 revealed that most violations (63%) occurred during the post-award stage, with 29% during the tendering phase, and the rest in the pre-tendering phase.

5.2.2 Effects of Electronic Material Management Practices and Organization Performance

The firm's stock levels are enhanced through the use of electronic material management practices (Mean: 3.96, Standard Deviation: 0.806) majority of respondents (53.1% Agree, 24.0% Strongly Agree) believe that electronic material management practices improve the firm's stock levels. The mean value of 3.96 suggests a strong positive perception of the impact of electronic material management on stock levels. EMM can make great improvements on transportation and logistics in

the organization (Mean: 4.09, Standard Deviation: 0.830) with 38.5% Strongly Agree and 32.4% Agree, this statement had the highest mean score of 4.09, indicating a strong belief that electronic material management (EMM) significantly improves transportation and logistics in the organization.

With EMM, the company can reduce capital expenses by ensuring there is no idle stock, and goods supplied meet customer demands (Mean: 4.08, Standard Deviation: 0.824) respondents (41.9% Agree, 34.6% Strongly Agree) perceive EMM as an effective tool in reducing capital expenses by managing stock levels more efficiently. The mean of 4.08 reflects a positive view on the financial benefits of EMM in reducing idle stock and meeting demand. Electronic material management practices eliminate duplicate handling of materials within the company's supply chain (Mean: 4.08, Standard Deviation: 0.741) with 48.0% Agree and 30.7% Strongly Agree, respondents believe that EMM reduces redundant handling of materials, which can enhance supply chain efficiency. The mean value of 4.08 shows strong agreement on this benefit of EMM. Electronic material management practices enable the company to facilitate the right type and quantities acquired in the first place (Mean: 4.08, Standard Deviation: 0.782) respondents (53.6% Agree, 29.6% Strongly Agree) believe that EMM helps in acquiring the right materials in the correct quantities. The mean of 4.08 suggests a strong perception of EMM's role in optimizing procurement. Research findings from Table 13 indicate that the majority of respondents held a positive view on the statements, with most agreeing with the points presented, as reflected in the percentages above. In e-procurement generates for network. These integrate automating the billing process. E-procurement revenues typically come from transaction fees. Effective pricing models like Fixed Pricing and Dynamic Pricing allow better help manage.

Fixed is based on predetermined catalog or negotiated prices, while Dynamic Pricing lets market forces determine the price, such as in reverse auctions or exchanges.

Billing management improves requisition, invoicing, and payment accuracy by automating processes and using electronic documentation, thus reducing transaction costs.

Siemsen et al. (2008) despite mandatory may bypass e-procurement provisions. While some studies highlight e-procurement's role in improving accountability, Subramaniam and Shaw (2002) note that it enhances price setting and billing management. However, others caution that merely implementing e-procurement doesn't guarantee compliance, as user perceptions of the system can affect contract adherence (Turban et al., 2006).

The electronic businesses send receive invoices (Brun, 2008). Hernandez-Ortega (2011), businesses capture transaction data and transmit it over a network, enhancing the management of across. It also strengthens transactions.

Several observation underscored benefits. Chegugu and Yusuf (2017) examined it's on public hospitals in Uasin Gishu County, Kenya, surveying 367 respondents across five hospitals. Their findings indicated that e-invoicing significantly enhanced procurement efficiency by improving supplier charge tracking. However, the study had empirical gaps, notably its exclusion of e-sourcing, e-payment, and e-tendering, as well as its limited focus beyond hospitals.

Similarly, Waganda (2018) investigated e-procurement in United Nations agencies in Nairobi and found that e-invoicing positively influenced procurement performance by reducing costs, accelerating payments, and improving data security. Yet, this study also did not address other e-procurement components or focus on SMEs within Nairobi City County.

Both studies contribute to the understanding of e-invoicing's role in procurement, but there are contextual and empirical gaps, particularly in relation to the inclusion of SMEs and the absence of practices sourcing, e-tendering.

5.2.3 Effects of electronic Invoicing and Organization Performance

"The cost of procurement transaction reduced through electronic invoicing (Mean: 3.85, Std Dev: 0.995) majority agreed (40.2%) or strongly agreed (28.5%) that electronic invoicing reduces procurement transaction costs. The mean (3.85) suggests a positive leaning, close to agreement. The standard deviation is moderately high, indicating some variability in responses possibly due to differing experiences or levels of implementation across respondents. organization (Mean: 3.92, Std Dev: 0.890) clear majority either agreed (34.6%) or strongly agreed (30.7%), indicating strong belief in the indirect benefits of e-invoicing on logistics. mean (3.92) is notably high, indicating a positive perception. A relatively lower standard deviation shows more consistency in responses. (Mean: 4.09, Std Dev: 0.819) statement received the highest agreement, with 39.1% agreeing and 36.3% strongly agreeing. The standard deviation is the lowest, consensus. Electronic invoicing reliability service delivery thereby ensuring improved organization performance (Mean: 4.02, Std Dev: 0.775) majority (54.7%) agreed and 25.7% strongly agreed, highlighting a strong belief in the reliability and performance-enhancing aspects of e-invoicing. The lowest standard deviation of all statements suggests this is the most unanimously agreed point.

Hunsinger (2015) highlights role of e-procurement in identifying, evaluating, and negotiating with suppliers, as well as building strong supplier and customer relationships, ultimately aiding organizational performance. The goal services at the lowest total cost while achieving organizational objectives (Chitungo & Munongo, 2013). It enhances knowledge within an organization and trains

staff on such as times, allows to identify new suppliers across spatial boundaries (Lu, 2015). This process increases competition and reduces risks in spend categories (Williams & Wynn, 2015).

Carlisle, (2006) on adoption Northern Ireland's construction industry found that e-procurement was driven by improvements in communication and cost reductions through IT, while barriers were linked to security and legal concerns. Kamotho (2014) explored e-procurement adoption in Kenyan government agencies, revealing that many state corporations had adopted e-procurement practices, which positively impacted procurement performance. Similarly, Ateto, Ondieki, and Okibo (2013) evaluated how e-procurement systems improved efficiency and value for money in public hospitals, specifically Kisii Level 5 Hospital, identifying poor change management.

Further, Dzama and Matavire (2013) investigated the adoption of e-procurement at CBZ Bank in Zimbabwe, focusing on strategic sourcing and the factors influencing adoption, including financial stability, cost, and strategic factors. They concluded that strong management support was crucial for effective adoption and the realization of strategic benefits.

Idrees et al. (2022) argue that e-sourcing involves using internet technology to identify potential suppliers for specific spending categories, enhancing competition among suppliers and improving organizational performance (Ribeiro & Henriques, 2011). Songip et al. (2013) further define e-sourcing as the process of creating, approving, and placing orders for goods and services via software systems based on internet technology, which boosts organizational performance. E-sourcing primarily focuses on indirect goods and services, those not directly related to the final product (Van Weele, 2010). These systems, such as ordering catalogs, are used throughout the organization, while enterprise resource planning systems manage direct goods and services, often requiring planned ordering (Salford & Roche, 2010).

Electronic ordering solutions streamline repetitive manual processes, reduce paperwork, lower costs, increase productivity, and improve customer service, thereby enhancing performance (Porter & Millar, 2015). Mentzer (2010) notes that online ordering systems enable customers to place orders through a company's website, which can boost sales by providing convenient home access (Minahan & Degan, 2011). Beyond facilitating transactions, e-sourcing also improves workflows, enhances flexibility, and fosters transparency in buyer-seller relationships, promoting better negotiations and creating richer arbitrage opportunities (Moon, 2015; Wong & Sloan, 2014).

E-sourcing also allows purchasing teams to focus on strategic activities, such as developing supply bases, managing supplier relationships, integrating suppliers into innovation processes, and restructuring value chains (Songip et al., 2013). Issa et al. (2013) found that e-sourcing helps identify suitable suppliers, ensuring the receipt of high-quality goods and services. While electronic sourcing reduces coordination and search costs in some contexts (Mentzer, 2010).

5.2.4 Performance of the organization

Respondents agreed that increased adherence to processes and procedures in relation to procurement (mean 3.0, Std .835). The respondent also agreed that (mean 4.04, Std .889). The respondent agreed that the Procurement planning has significantly improved (mean 4.12, Std .944). Most respondents strongly agreed that better procurement benchmarks have been set up (mean 4.11, Std .941). The respondent also agreed that (mean 4.13, Std .835).Most respondents agreed with the the overall performance has generally improved (mean 4.12, std .823).

This data helps organizations optimize system performance, analyze growth patterns, and adapt to market or technical needs. Continuous monitoring of system security and traffic is crucial to prevent breakdowns, security issues, scalability problems, and poor marketplace performance caused by inefficient transaction engines.

Aberdeen, (2011), systems have delivered significant benefits, including a 70%-80% reduction in requisition-to-fulfillment cycles, a 73% reduction in administrative costs, a 5%-10% decrease in material prices, halved off-contract buying, and a 25%-50% reduction in inventory costs. System management these achievements automating validation electronic proposals, allowing suppliers to receive immediate feedback. Moreover, modern e-procurement systems automate processes such as order creation, approval routing, order transmission to vendors, invoicing, and payments, significantly reducing effort and time.

E-procurement systems also drive substantial financial savings. For example, the Bank of Ireland saved within and improvements. Alcoa Inc., a major aluminum producer, adopted e-procurement in 1999 to reduce operating resource costs and integrate supplier relationships.

By leveraging tools like the internet and intranet, organizations can automate their procurement processes, which reduces time-to-market, minimizes inventory, and lowers costs associated with capital assets, such as storage and taxes. Dell, for instance, emphasizes the importance of linking updated daily demand with inbound supply flows to optimize inventory management and achieve "virtual integration" (Dell, 1999).

5.3 Conclusion of the study

5.3.1 Electronic Tendering and Organization Performance

Findings indicate that majority of respondents agree that electronic procurement practices, specifically electronic tendering, positive supply chain in organizations within Nairobi Metropolitan. A significant portion of respondents believe that electronic tendering enhances transparency within organizations (mean = 3.79, std = 0.901), reducing opportunities for corruption and increasing accountability in the

procurement process. The move from traditional tendering to electronic methods is seen as a cost-effective solution, with respondents agreeing that e-tendering reduces the costs associated with manual processes, thereby improving overall supply chain performance (mean = 3.99, std = 0.841). Respondents highlighted that e-tendering accelerates the procurement process, improving the speed and responsiveness of the supply chain (mean = 4.16, std = 0.770). This efficiency allows for quicker decision-making and enhances overall operational performance. The adoption of electronic tendering helps to standardize procurement processes across the organization, ensuring consistency and fairness throughout the supply chain (mean = 4.27, std = 0.863). This standardization streamlines operations and reduces complexity in managing procurement. The use of electronic tendering reduces the likelihood of manual errors, which are common in traditional procurement methods. Respondents recognized the reduction in errors as a key benefit of e-tendering in improving supply chain management (mean = 3.99, std = 0.746). A notable finding was that respondents strongly favored electronic tendering, suggesting a positive customer perception of these products (mean = 4.04, std = 0.763). Kamotho (2014) noted that e-tendering, the process of conducting tenders through electronic means, has significantly transformed procurement practices by introducing greater efficiency, transparency, and accessibility. By utilizing digital platforms, organizations can streamline the tendering process. E-tendering allows for broader participation from suppliers, leading to increased competition and potentially better pricing. automation tender-related tasks minimizes human error, ensures compliance with procurement regulations, and provides a clear audit trail, enhancing reducing informed and strategic decisions, ultimately improving their procurement outcomes.

Gathima and Njoroge (2018) also argued that extends beyond cost savings and efficiency gains. By fostering a more competitive and transparent procurement environment, e-tendering helps organizations build stronger relationships with suppliers. These improved relationships can lead to

better terms, higher quality supplies, and more reliable delivery schedules, all of which contribute to smoother operations and higher overall performance.

5.3.2 Electronic Material Management Practices and Organization Performance

The firm's stock levels are enhanced through the use of electronic material management practices (Mean: 3.96, Standard Deviation: 0.806) majority of respondents (53.1% Agree, 24.0% Strongly Agree) believe that electronic material management practices improve the firm's stock levels. The mean value of 3.96 suggests a strong positive perception of the impact of electronic material management on stock levels. EMM can make great improvements on transportation and logistics in the organization (Mean: 4.09, Standard Deviation: 0.830) with 38.5% Strongly Agree and 32.4% Agree, this statement had the highest mean score of 4.09, indicating a strong belief that electronic material management (EMM) significantly improves transportation and logistics in the organization.

With EMM, the company can reduce capital expenses by ensuring there is no idle stock, and goods supplied meet customer demands (Mean: 4.08, Standard Deviation: 0.824) respondents (41.9% Agree, 34.6% Strongly Agree) perceive EMM as an effective tool in reducing capital expenses by managing stock levels more efficiently. The mean of 4.08 reflects a positive view on the financial benefits of EMM in reducing idle stock and meeting demand. Electronic material management practices eliminate duplicate handling of materials within the company's supply chain (Mean: 4.08, Standard Deviation: 0.741) with 48.0% Agree and 30.7% Strongly Agree, respondents believe that EMM reduces redundant handling of materials, which can enhance supply chain efficiency. The mean value of 4.08 shows strong agreement on this benefit of EMM. Electronic material management practices enable the company to facilitate the right type and quantities acquired in the first place (Mean: 4.08, Standard Deviation: 0.782) respondents (53.6% Agree, 29.6% Strongly Agree) believe that EMM helps in acquiring the right materials in the correct quantities. The mean of 4.08 suggests a strong perception of

EMM's role in optimizing procurement. Research findings from Table 13 indicate that the majority of respondents held a positive view on the statements, with most agreeing with the points presented, as reflected in the percentages above. In e-procurement generates for network. These integrate automating the billing process. E-procurement revenues typically come from transaction fees. Effective pricing models like Fixed Pricing and Dynamic Pricing allow better help manage.

Fixed is based on predetermined catalog or negotiated prices, while Dynamic Pricing lets market forces determine the price, such as in reverse auctions or exchanges.

Billing management improves requisition, invoicing, and payment accuracy by automating processes and using electronic documentation, thus reducing transaction costs.

Siemsen et al. (2008) despite mandatory may bypass e-procurement provisions. While some studies highlight e-procurement's role in improving accountability, Subramaniam and Shaw (2002) note that it enhances price setting and billing management. However, others caution that merely implementing e-procurement doesn't guarantee compliance, as user perceptions of the system can affect contract adherence (Turban et al., 2006).

The electronic businesses send receive invoices (Brun, 2008). Hernandez-Ortega (2011), businesses capture transaction data and transmit it over a network, enhancing the management of across. It also strengthens transactions.

Several observation underscored benefits. Chegugu and Yusuf (2017) examined it's on public hospitals in Uasin Gishu County, Kenya, surveying 367 respondents across five hospitals. Their findings indicated that e-invoicing significantly enhanced procurement efficiency by improving

supplier charge tracking. However, the study had empirical gaps, notably its exclusion of e-sourcing, e-payment, and e-tendering, as well as its limited focus beyond hospitals.

Similarly, Waganda (2018) investigated e-procurement in United Nations agencies in Nairobi and found that e-invoicing positively influenced procurement performance by reducing costs, accelerating payments, and improving data security. Yet, this study also did not address other e-procurement components or focus on SMEs within Nairobi City County..

5.3.3 Electronic Invoicing and Organization Performance

The research findings suggest a positive perception of electronic invoicing (e-invoicing) among respondents, particularly regarding its impact on procurement processes and overall organizational performance. Respondents agreed that e-invoicing helps reduce the cost of procurement transactions (mean = 3.85, std = 0.995). This indicates that automating invoicing processes leads to cost efficiencies by minimizing manual processes and associated expenses. E-invoicing is seen as a tool that enhances transportation and logistics within the organization (mean = 3.92, std = 0.890). The improvement likely stems from streamlined processes and better coordination of procurement-related logistics. Most respondents acknowledged that e-invoicing speeds up communication within procurement (mean = 4.09, std = 0.819). Faster communication likely reduces delays, making procurement operations more responsive and efficient. E-invoicing improves the reliability of service delivery, which positively influences overall organizational performance (mean = 4.02, std = 0.775). This suggests that electronic systems ensure greater accuracy, consistency, and timeliness in the procurement process, contributing to better organizational outcomes.

Hunsinger (2015) highlights role of e-procurement in identifying, evaluating, and negotiating with suppliers, as well as building strong supplier and customer relationships, ultimately aiding

organizational performance. The goal services at the lowest total cost while achieving organizational objectives (Chitungo & Munongo, 2013). It enhances knowledge within an organization and trains staff on such as times, allows to identify new suppliers across spatial boundaries (Lu, 2015). This process increases competition and reduces risks in spend categories (Williams & Wynn, 2015).

Carlisle, (2006) on adoption Northern Ireland's construction industry found that e-procurement was driven by improvements in communication and cost reductions through IT, while barriers were linked to security and legal concerns. Kamotho (2014) explored e-procurement adoption in Kenyan government agencies, revealing that many state corporations had adopted e-procurement practices, which positively impacted procurement performance. Similarly, Ateto, Ondieki, and Okibo (2013) evaluated how e-procurement systems improved efficiency and value for money in public hospitals, specifically Kisii Level 5 Hospital, identifying poor change management.

5.3.4 Performance of the organization

Respondents agreed that increased adherence to processes and procedures in relation to procurement (mean 3.0, Std .835). The respondent also agreed that (mean 4.04, Std .889). The respondent agreed that the Procurement planning has significantly improved (mean 4.12, Std .944). Most respondents strongly agreed that better procurement benchmarks have been set up (mean 4.11, Std .941). The respondent also agreed that (mean 4.13, Std .835).Most respondents agreed with the the overall performance has generally improved (mean 4.12, std .823).

This data helps organizations optimize system performance, analyze growth patterns, and adapt to market or technical needs. Continuous monitoring of system security and traffic is crucial to prevent breakdowns, security issues, scalability problems, and poor marketplace performance caused by inefficient transaction engines.

Aberdeen, (2011), systems have delivered significant benefits, including a 70%-80% reduction in requisition-to-fulfillment cycles, a 73% reduction in administrative costs, a 5%-10% decrease in material prices, halved off-contract buying, and a 25%-50% reduction in inventory costs. System management these achievements automating validation electronic proposals, allowing suppliers to receive immediate feedback. Moreover, modern e-procurement systems automate processes such as order creation, approval routing, order transmission to vendors, invoicing, and payments, significantly reducing effort and time.

E-procurement systems also drive substantial financial savings. For example, the Bank of Ireland saved within and improvements. Alcoa Inc., a major aluminum producer, adopted e-procurement in 1999 to reduce operating resource costs and integrate supplier relationships.

5.4 Recommendations

Nairobi metropolitan should invest in robust IT infrastructure to support electronic procurement (e-procurement) systems. Reliable internet connections, secure networks, and cloud-based platforms are essential for optimizing e-procurement practices. National government can also support this by improving digital infrastructure in Nairobi Metropolitan to enable widespread adoption of electronic procurement systems. Companies should prioritize training employees on how effectively use e-procurement systems. This will reduce resistance to change, increase user competency, and minimize errors during the procurement process. Continuous professional development programs on the latest e-procurement trends and tools should implemented to ensure organizations stay up-to-date.

Government and regulatory bodies should create and enforce policies that encourage the adoption of e-procurement systems while ensuring compliance with legal standards. Incentives provided to firms

that implement and maintain electronic procurement practices, such as tax benefits or grants to improve digital infrastructure. Organizations should work closely with suppliers to integrate them into the e-procurement systems. This would involve training suppliers, upgrading their systems, and ensuring a seamless digital flow of information between buyers and suppliers. Improved supplier engagement would lead to better communication, reduced lead times, and enhanced supply chain performance

Companies should standardize procurement processes across departments using e-procurement systems to ensure consistency, fairness, and efficiency in managing tenders, orders, and inventory. Standardized processes help to reduce human errors, eliminate redundancies, and improve transparency in procurement activities. Organizations should consider implementing advanced e-procurement tools such as automated purchase orders, electronic catalogs, and real-time procurement analytics further optimize supply chain performance. Utilizing predictive analytics and artificial intelligence in procurement can also help in demand forecasting and better decision-making.

Stakeholders, including government, industry associations, and private sector players, should collaborate to share best practices and promote the benefits of e-procurement adoption in Nairobi Metropolitan and beyond. Public-private partnerships can play a crucial role in increasing awareness and fostering the widespread use of e-procurement tools.

5.5 Suggestion for Further Studies

. It is therefore recommended that additional research be undertaken to explore how small and medium enterprises (SMEs) in Kenya are adopting e-procurement and the subsequent effects on their supply chain performance. Given that SMEs often operate under significant resource constraints, it is crucial to understand the specific challenges they face as well as the strategies that have led to successful

implementation of e-procurement systems.

Such research can offer valuable insights into how SMEs can be better supported in their digital transformation efforts. Furthermore, a comparative analysis examining the impact of e-procurement on supply chain performance across different types of enterprises would be beneficial. Future studies could focus on key sectors such as manufacturing, healthcare, retail, and construction to determine whether the advantages of e-procurement are more pronounced in certain industries than in others.

REFERENCE

Maina, L. N. (2018). *Effect Of E-procurement Practices On Performance Of Inventory Management In The Manufacturing Firms In Nairobi County, Kenya* (Doctoral dissertation, Kca University).

Khalif, A. M. (2018). *E-procurement Strategies and Supply Chain Performance of Private Hospitals in Nairobi, Kenya* (Doctoral dissertation, university of nairobi).

Maalim, K., Magutu, P. O., & Mose, J. M. (2019). E-Procurement Strategies And Supply Chain Performance Of Private Hospitals In Nairobi, Kenya. *Noble International Journal of Social Sciences Research*, *4*(11), 145-156.

Maalim, K., Magutu, P. O., & Mose, J. M. (2019). E-PROCUREMENT STRATEGIES AND SUPPLY CHAIN PERFORMANCE OF PRIVATE HOSPITALS IN NAIROBI, KENYA. *Noble International Journal of Social Sciences Research*, *4*(11), 145-156.

Maalim, K. A. (2018). *E-procurement Strategies and Supply Chain Performance of Private Hospitals in Nairobi, Kenya* (Doctoral dissertation, university of nairobi).

Chenane, L., Juma, D., & Eshiteti, S. (2024). Effect of Mentorship on Performance of Mission Hospitals in Kenya. *Journal of Human Resource and Leadership*, *9*(2), 32-46.

Chenane, L., Juma, D., Eshiteti, S., & Miroga, J. (2024). Effect of Creative Work Culture on Performance of Mission Hospitals in Kenya. *International Journal of Leadership and Governance*, *4*(1), 27-40.

Muatwa, B. K., & Shale, N. I. (2023). INFLUENCE OF PROCUREMENT OPTIMIZATION ON PERFORMANCE OF METROPOLITAN COUNTIES IN KENYA. *International Journal of Management and Business Research*, *5*(1).

Mogere, J. O. (2021). *E-procurement and Supply Chain Performance in the Sugar Factories in Kenya* (Doctoral dissertation, University of Nairobi).

MOGERE, J. O. E-PROCUREMENT AND SUPPLY CHAIN PERFORMANCE IN THE SUGAR FACTORIES IN KENYA.

Bahiru Tefera, B., & Tilahun Anbessa, G. (2022). Pharmaceutical supply chain practices and its associated factors in public health facilities, West Gojjam Zone, Ethiopia: Cross-Sectional Study. *Hospital Pharmacy*, *57*(5), 622-632.

Getahun, H., Belew, S., Hasen, G., Tefera Mekasha, Y., & Suleman, S. (2024). Assessment of the

extent and monetary loss in the selected public hospitals in Jimma Zone, Ethiopia: expired medicine perspectives. *Frontiers in Medicine*, *11*, 1283070.

Hailu, R., Gizaw, T., Berhanu, N., Mulugeta, T., Boche, B., & Gudeta, T. (2023). Exploring the role of ICT in pharmaceutical supply chain practices and operational performance in Ethiopia: a structural equation modeling approach. *BMC Health Services Research*, *23*(1), 634.

Moteri, M. A., & Alojail, M. (2023). Factors influencing the Supply Chain Management in e-Health using UTAUT model. *Electronic Research Archive*, *31*(5).

Seddigh, M. R., & Nourigheimasi, F. (2022). The spirit of literature about the underlying problems facing patients' health and rights caused by pharmaceutical businesses: A text mining based systematic review.

Alojail, M. A. M. M. Factors influencing the Supply Chain Management in e-Health using UTAUT model.

Chalen Chang, C. A. (2023). Factores logísticos soportados en sistemas de información y la calidad de servicio al sector público en farmacéutica, Lima, 2023.

Tefera, B. B., & Anbessa, G. T. (2024). Status and determinants of healthcare supply chain practices in public health facilities, Northwest Ethiopia: Mixed-method study. *The Journal of Medicine Access*, *8*, 27550834241263702.

Win, T. T. (2022). *The Effect of Supply Chain Management Practices on Competitive Advantage and Organizational Performance of Wine Making Firms (Than Than Win, 2022)* (Doctoral dissertation, MERAL Portal).

Okello, J. A. (2017). *Supply chain management practices and performance of private hospitals in Nairobi Kenya* (Doctoral dissertation, University of Nairobi).

Muriuki, J. I. (2021). *Effect of Information and Communication Technology on Procurement Performance in Energy Sector State Corporations in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Demberere, J., Waithaka, R. K., & Matunga, D. A. (2023). *E-Procurement Practices and Supply Chain Performance*. IPR Journals and Book Publishers.

Obinda, R. A., & Gichure, J. M. (2017). Effects Of Supplier Selection On Supply Chain Performance; Case Of Nairobi City County. *The International Journal of Advanced Manufacturing Technology*, *95*(9), 3609-3629.

Obinda, R. A., & Gichure, J. M. EFFECTS OF SUPPLIER SELECTION ON SUPPLY CHAIN

PERFORMANCE; CASE OF NAIROBI CITY COUNTY.

Obinda, R. A., & Gichure, J. M. EFFECTS OF SUPPLIER SELECTION ON SUPPLY CHAIN PERFORMANCE; CASE OF NAIROBI CITY COUNTY.

Bienhaus, F., & Haddud, A. (2018). Procurement 4.0: factors influencing the digitisation of procurement and supply chains. *Business Process Management Journal*, *24*(4), 965-984.

Lysons, K., & Farrington, B. (2020). *Procurement and supply chain management*. Pearson UK.

Khan, S. A. R., & Qianli, D. (2017). Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan. *Environmental Science and Pollution Research*, *24*, 16829-16844.

Lee, K., Azmi, N., Hanaysha, J., Alzoubi, H., & Alshurideh, M. (2022). The effect of digital supply chain on organizational performance: An empirical study in Malaysia manufacturing industry. *Uncertain Supply Chain Management*, *10*(2), 495-510.

Nani, D. A., & Ali, S. (2020). Determinants of Effective E-Procurement System: Empirical Evidence from Indonesian Local Governments. *Jurnal Dinamika Akuntansi dan Bisnis*, *7*(1), 33-50.

Nani, D. A., & Ali, S. (2020). Determinants of Effective E-Procurement System: Empirical Evidence from Indonesian Local Governments. *Jurnal Dinamika Akuntansi dan Bisnis*, *7*(1), 33-50.

Brandon-Jones, A., & Kauppi, K. (2018). Examining the antecedents of the technology acceptance model within e-procurement. *International journal of operations & production management*, *38*(1), 22-42.

Qi, Y., Huo, B., Wang, Z., & Yeung, H. Y. J. (2017). The impact of operations and supply chain strategies on integration and performance. *International Journal of Production Economics*, *185*, 162-174.

Bag, S., Wood, L. C., Mangla, S. K., & Luthra, S. (2020). Procurement 4.0 and its implications on business process performance in a circular economy. *Resources, conservation and recycling*, *152*, 104502.

Aslam, J., Saleem, A., Khan, N. T., & Kim, Y. B. (2021). Factors influencing blockchain adoption in supply chain management practices: A study based on the oil industry. *Journal of Innovation & Knowledge*, *6*(2), 124-134.

De Vass, T., Shee, H., & Miah, S. J. (2018). The effect of "Internet of Things" on supply chain

integration and performance: An organisational capability perspective. *Australasian Journal of Information Systems*, *22*.

Masudin, I., Aprilia, G. D., Nugraha, A., & Restuputri, D. P. (2021). Impact of E-procurement adoption on company performance: Evidence from Indonesian manufacturing industry. *Logistics*, *5*(1), 16.

Chen, Y., Bretschneider, S., Stritch, J. M., Darnall, N., & Hsueh, L. (2021). E-procurement system adoption in local governments: the role of procurement complexity and organizational structure. *Public Management Review*, 1-23.

Iles, J. (2017). How e-procurement is related to the success of US cities' sustainable purchasing policies?

Saleh, S. Y. (2018). *Determining critical factors of e-procurement adoption among suppliers in Iraq* (Doctoral dissertation, Universiti Utara Malaysia).

Sánchez-Rodríguez, C., Martínez-Lorente, A. R., & Hemsworth, D. (2019). E-procurement in small and medium sized enterprises; facilitators, obstacles and effect on performance. *Benchmarking: An International Journal*.

APPENDICES

Appendix I: **CONSENT LETTER**

Dear Sir/Madam,

RE: REQUEST FOR YOUR CONSENT TO PARTICIPATE IN A RESEARCH STUDY

I am writing to kindly request your participation in a research study titled "The Influence of Electronic Procurement Practices on Supply Chain Performance in Nairobi Metropolitan, Kenya." Your participation will involve completing a questionnaire and the risks or discomforts involved are minimal. Before filling out the questionnaire, all participants will be reminded to maintain confidentiality regarding any discussions or information shared. Please note that there are no direct personal benefits for participating in this study. Participation is entirely voluntary, and no payments or incentives will be offered in exchange for your time or responses. You are free to decline to participate or to withdraw from the study at any point without any consequences. All information provided will be treated with the utmost confidentiality. The data collected will solely be used for academic purposes related to this study and will be securely destroyed once the research findings are published.

If you agree to participate, kindly sign in the space provided below.

Participant's Signature: _____ Date: _____

Sincerely,

Ali Wario Huna

Researcher

Appendix II: Questionnaire for the Respondents

SECTIONA: Demographic Information

1**.** What is your Gender

Male ☐ Female ☐

2. What level of education have you attained?

Primary [ ] Secondary [ ] Diploma [ ] University [ ]

Other(Specify)……

3. How many years have worked in the organization?

Below 5 years [ ] 6-9 years [ ] over 10 years [ ]

SECTION B: Electronic Tendering and Organization Performance

Kindly choose by ticking 1-5 the level to which electronic tendering influence organizational performance.

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

	Scale of agreement				
Statement question	**1**	**2**	**3**	**4**	**5**
Electronic tendering improves transparency within the organization.					
Electronic tendering helps reduce costs associated with the traditional tendering process, thus enhancing supply chain performance.					
Electronic tendering increases the speed of the entire tendering process, thereby improving supply chain performance within the organization.					
Adopting electronic tendering helps standardize the buying process across the organization's supply chain management.					
The e-tendering process reduces the potential for manual errors					

in the organization's supply chain management.					

SECTION C: Electronic Material Management Practices and Organization Performance

	Scale of agreement				
Statement	1	2	3	4	5
The firm's stock levels are enhanced through the use of electronic Material Management practices.					
EMM can lead to significant improvements in transportation and logistics within the organization.					
With EMM, the company can reduce capital expenses by minimizing idle stock, ensuring that goods supplied meet customer demands					
Electronic Material Management practices eliminate the duplicate handling of materials within the company's supply chain.					
Electronic Material Management practices help the company acquire the right types and quantities of materials in the first place.					

SECTION D: Electronic Invoicing and Organization Performance

	Scale of agreement				
Statement	1	2	3	4	5
The cost of procurement transactions is reduced through electronic invoicing.					
Electronic invoicing can lead to significant improvements in transportation and logistics within the organization.					
Electronic invoicing speeds up communication regarding procurement processes within the organization.					
The reliability of service delivery is improved through electronic invoicing, thereby enhancing overall organizational performance.					

SECTION E: Performance of the Organization

Performance of the Organization	1	2	3	4	5
There is increased adherence to processes and procedures in relation to procurement.					
The organization is producing better quality products and services.					
Procurement planning has significantly improved.					
Better procurement benchmarks have been established.					
Procurement integrity and transparency have been enhanced.					
The overall performance of the organization has generally improved.					

Appendix III: Directorate of Graduate Studies

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPSM/2023/51568

22nd October, 2024

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

Dear Sir/Madam,

RE: ALI WARIO HUNA– REGISTRATION NO. MPSM/2023/51568

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

The title of the research is **"An Influence of Electronic Procurement Practices and Supply Chain Performance in Nairobi Metropolitan, 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 **October, 2024 and December, 2024.**

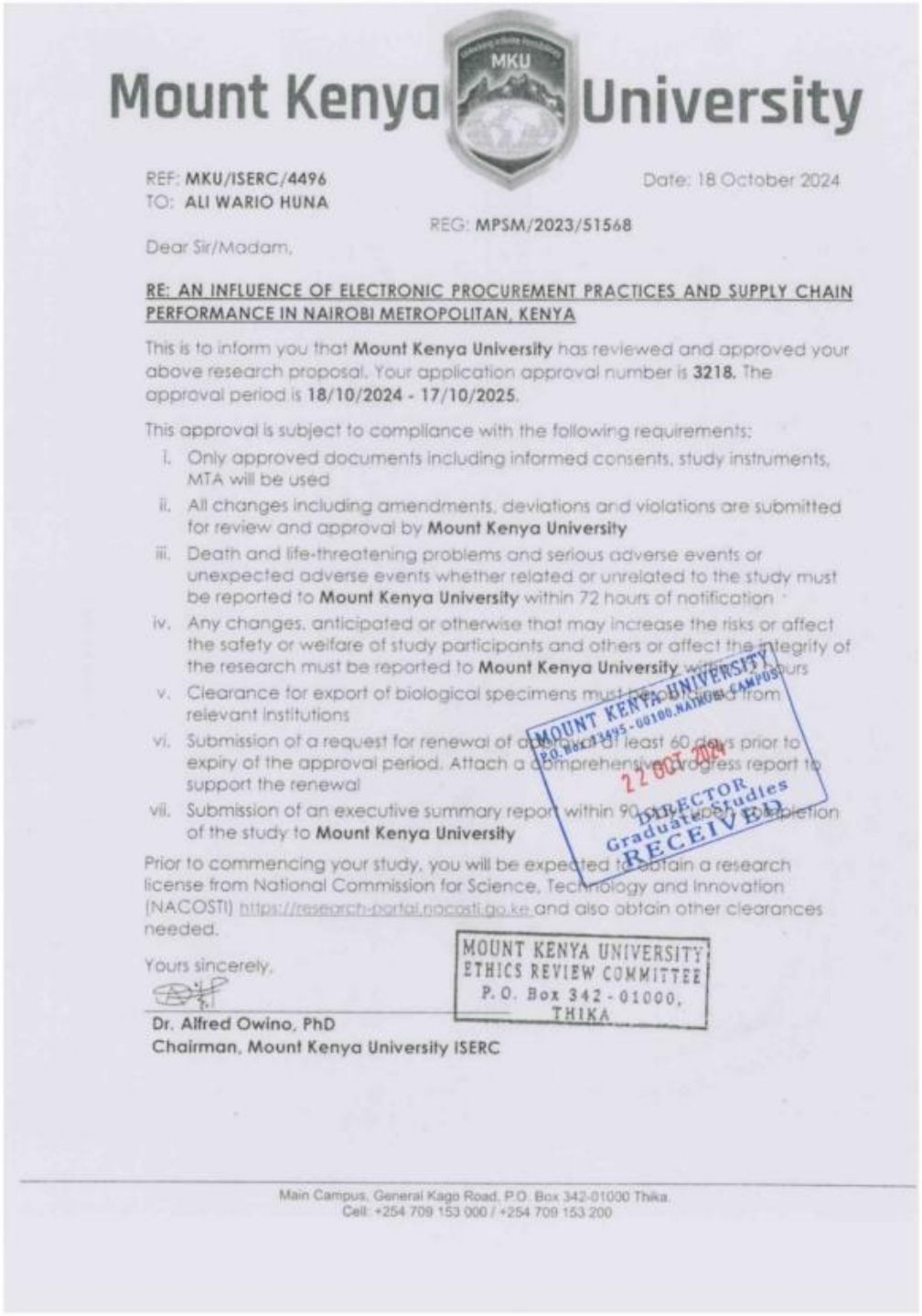
Any assistance accorded to the student will be highly appreciated.

Thank you.

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

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

Appendix IV: ERC



Mount Kenya University

REF: MKU/ISERC/4496
TO: ALI WARIO HUNA

Date: 18 October 2024

REG: MPSM/2023/51568

Dear Sir/Madam,

RE: AN INFLUENCE OF ELECTRONIC PROCUREMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE IN NAIROBI METROPOLITAN, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **3218.** The approval period is **18/10/2024 - 17/10/2025.**

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.

Yours sincerely,

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

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

MOUNT KENYA UNIVERSITY
P.O. Box 13495 - 00100, NAIROBI CAMPUS
22 OCT 2024
DIRECTOR
Graduate Studies
RECEIVED

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 / +254 709 153 200

Appendix V: NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **984837**

Date of Issue: **28/October/2024**

RESEARCH LICENSE

This is to Certify that Mr.. ALI WARIO HUNA 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: AN INFLUENCE OF ELECTRONIC PROCUREMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE IN NAIROBI METROPOLITAN, KENYA for the period ending : 28/October/2025.

License No: **NACOSTI/P/24/41610**

984837

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