EFFECT OF ELECTRONIC PROCUREMENT ON ORGANIZATIONAL SUPPLY CHAIN PERFORMANCE: A CASE STUDY OF THE PETROLEUM AUTHORITY OF UGANDA

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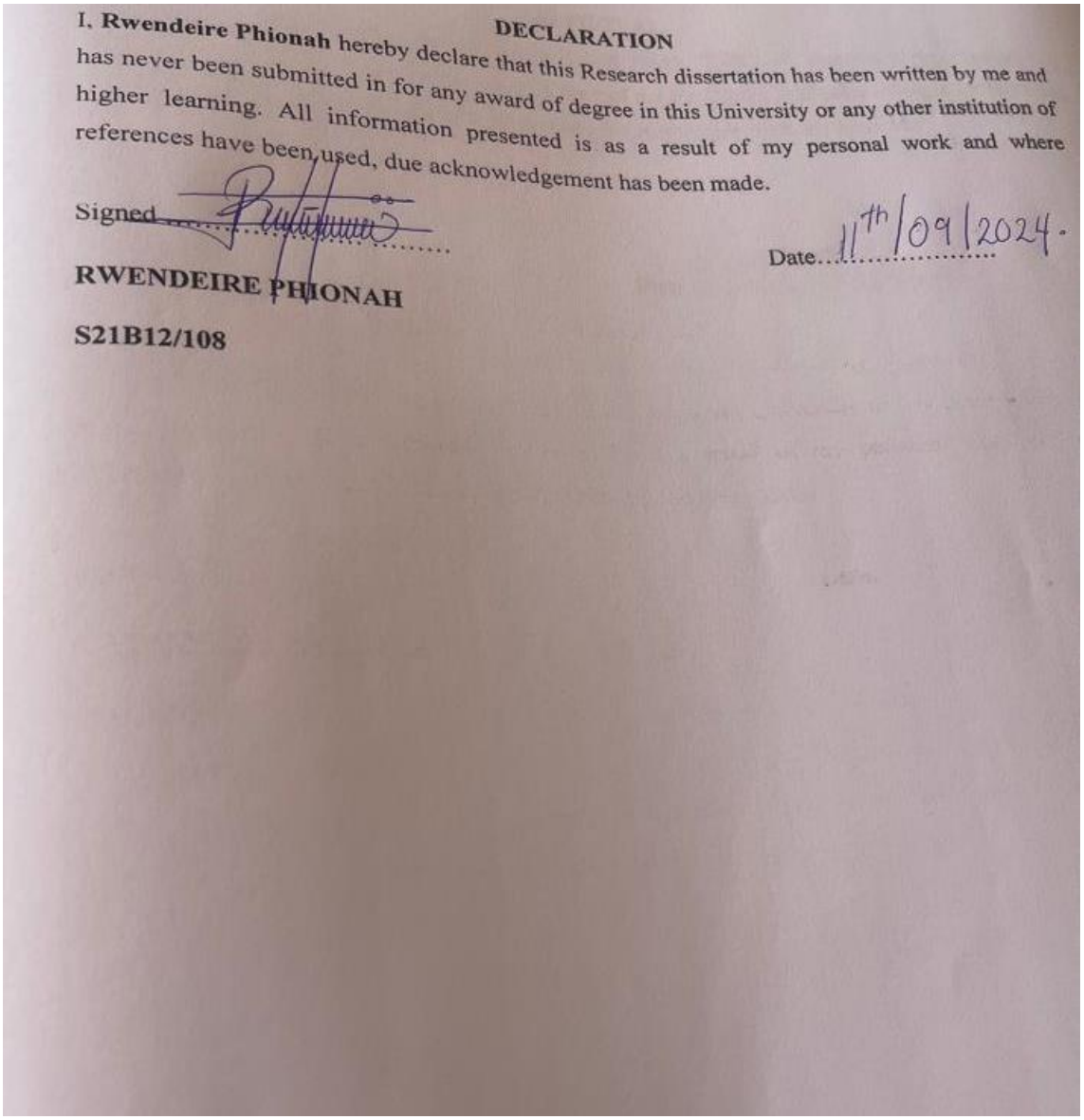
DECLARATION



DECLARATION

I, **Rwendeire Phionah** hereby declare that this Research dissertation has been written by me and has never been submitted in for any award of degree in this University or any other institution of higher learning. All information presented is as a result of my personal work and where references have been used, due acknowledgement has been made.

Signed .....

Date 11th/09/2024.

RWENDEIRE PHIONAH

S21B12/108

APPROVAL

This is to certify that this research dissertation titled "Effect of electronic procurement on organizational supply chain performance, a case of the Petroleum Authority of Uganda" has been written under my supervision and is now ready for submission with my approval

Signature.....

Date.....11/09/2024

Mr. Aryamanya Aston Blessed

University supervisor

DEDICATION

I dedicate this research to my family and my university supervisor who advised and supported me in everything without giving up on me

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to God Almighty, who grants wisdom beyond human understanding and is ever-present in all circumstances.

My heartfelt thanks go to my husband and parents for their unwavering support financially, materially, emotionally, and in countless other ways. I am sincerely grateful to my university supervisor, Mr. Aryamanya Aston, for his consistent support and invaluable feedback throughout this process. Your guidance has been instrumental in shaping this study.

Lastly again, I thank God for the good health and strength. He has bestowed upon me, allowing me to carry out this research from beginning to end with success**.**

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ABSTRACT

This study investigated the impact of electronic procurement on organizational supply chain performance, with a specific focus on the Petroleum Authority of Uganda. Employing a descriptive cross-sectional research design, the study aimed to evaluate the roles of electronic tendering, e-invoicing, and e-payments in enhancing supply chain efficiency and effectiveness.

A sample of 45 employees from the procurement department and other related departments were selected through stratified random sampling, and quantitative data was collected using structured questionnaires and data analyzed using SPSS.

The findings indicate that electronic tendering significantly enhances supply chain performance by increasing efficiency, reducing costs, and fostering competitive bidding. Despite these benefits, some challenges related to procurement cycle times and communication persist. Electronic invoicing has also demonstrated a positive impact, particularly in streamlining payment processes and improving cash flow management. However, the effectiveness of electronic invoicing in reducing errors and disputes with suppliers varies across organizations. Electronic payments have contributed to faster transactions, improved administrative efficiency, and enhanced financial security, though issues related to transaction accuracy and cash flow management remain.

The study concludes that while electronic procurement systems offer considerable advantages in operational efficiency, cost-effectiveness, and supplier relationships, there are areas for improvement. Recommendations include enhancing system integration and user training for electronic tendering, fully integrating electronic invoicing systems into financial workflows, and addressing challenges associated with electronic payments. These measures will help organizations fully capitalize on the benefits of electronic procurement and achieve more consistent performance improvements in their supply chains**.**

CHAPTER ONE

1.0 Introduction

This chapter presents the background of the study, statement of problem, objectives of study, research questions, and Conceptual Framework.

1.1 Background of the study

Globally, electronic procurement has emerged as a transformative technology that has provided organizations with vast opportunities to operate beyond traditional physical boundaries. McGregor and Vrazalie (2005) argue that electronic procurement enhances professionalism among procurement staff by encouraging the use of advanced technology systems. These systems enable firms to implement more effective solutions that drive significant value into their operations (Neef, 2001). Lichnel Porter, a renowned advocate for internet-based business strategies, highlighted in 2003 that businesses seeking to remain competitive must adopt internet-based approaches. He further emphasized that the internet can only become a powerful source of competitive advantage if integrated into a firm's overall strategies.

With advancements in digital platforms and online marketplaces, electronic procurement has evolved to streamline procurement processes and improve supply chain performance. Li et al. (2008) found that electronic procurement systems enhance supply chain visibility, reduce lead times, and boost overall supply chain efficiency. These systems have enabled organizations to better track inventory, monitor supplier performance, and respond more rapidly to shifts in demand or supply. Chen and Paulraj (2019) further underscore that electronic procurement positively impacts supply chain integration and coordination by fostering improved collaboration and reducing errors.

In Africa, the adoption of electronic procurement has been slower but is gaining momentum as technological infrastructure improves. Across the continent, electronic procurement is seen as a key enabler of supply chain performance. Vaidya, Sajeev, and Calendar (2006) highlight that electronic procurement encompasses activities such as e-invoicing, e-payments, e-order processing, and e-tendering, which have been embraced by organizations to enhance their market positions. The automation of these processes allows companies to streamline operations and improve the efficiency of their supply chain activities. Rao and Ragunathan (2007) note that the

pressure on African organizations to embrace electronic procurement is increasing, as firms strive to improve their competitive edge in a rapidly globalizing marketplace.

One of the significant barriers to widespread adoption in Africa has been the lack of robust technological infrastructure and limited expertise in electronic procurement systems. Despite these challenges, some African countries have made strides in adopting electronic procurement, particularly in the public sector, where governments are pushing for more transparent and efficient procurement practices.

In East Africa, electronic procurement is gradually transforming the supply chain landscape. Countries like Kenya, Tanzania, and Rwanda have started implementing electronic procurement systems to enhance efficiency and transparency in procurement processes. This has been especially evident in the public sector, where governments are adopting digital platforms for procurement activities such as e-tendering and e-invoicing. According to Handfield et al. (2011), suppliers in East Africa are increasingly leveraging electronic procurement to automate supply chain processes, improving their ability to meet the demands of buyers more efficiently.

Rao and Ragunathan (2007) assert that firms in East Africa are recognizing the importance of electronic procurement in enhancing supply chain performance. This shift towards digital procurement has enabled organizations to reduce procurement costs, streamline processes, and improve coordination across the supply chain. However, challenges such as limited technological infrastructure, lack of skilled personnel, and resistance to change continue to hinder the full adoption of electronic procurement in the region.

In Uganda, electronic procurement has started to gain traction in both the public and private sectors. Many organizations are adopting e-procurement systems to improve supply chain efficiency, reduce costs, and enhance transparency. Vaidya et al. (2006) note that electronic procurement in Uganda encompasses activities such as e-ordering, e-payments, and e-tendering. However, despite these advancements, there are still barriers to widespread adoption, including limited access to reliable IT infrastructure, inadequate training of procurement staff, and resistance to change.

Vast and Walsham (2009) highlight that Uganda, like many other developing countries, faces challenges related to the integration of electronic procurement systems with existing infrastructures. These challenges include limited internet connectivity, insufficient IT equipment, and a lack of skilled personnel. Despite these obstacles, there is growing recognition among Ugandan firms of the potential benefits of electronic procurement, such as increased transparency, reduced paperwork, and improved supply chain efficiency.

The Petroleum Authority of Uganda has taken significant steps to modernize its supply chain processes through the adoption of electronic procurement. The organization has implemented Integra, a comprehensive supply chain software system designed to integrate all supply chain activities. This move aims to enhance efficiency, improve supplier performance, and streamline procurement operations. Despite these advancements, the Petroleum Authority of Uganda still faces challenges in realizing the full potential of electronic procurement. These challenges include the attitudes of staff towards technology, limited IT infrastructure, and a lack of expertise in the mechanisms of electronic procurement.

Nonetheless, electronic procurement at the Petroleum Authority of Uganda has provided several key benefits, including improved process efficiency, enhanced transparency, and cost reduction. The organization is working to address existing challenges through training initiatives and investment in IT infrastructure, with the goal of fully optimizing its electronic procurement system and improving overall supply chain performance.

1.2 Statement of the Problem

Many organizations, including the Petroleum Authority of Uganda (PAU), aim to achieve an ideal supply chain performance through the implementation of electronic procurement (e-procurement) (Ouko et al., 2009). This system is expected to streamline procurement activities, enhance transparency, and reduce operational costs by automating processes, reducing paperwork, and improving supplier relationships (Ouko et al., 2009). Despite these anticipated benefits, organizations face issues such as employee resistance to change, inadequate training cybersecurity concerns, and technical difficulties (Smith, 2020). These problems have hindered the full realization of e-procurement's potential, resulting in persistent delays and supplier management issues (Ouko et al., 2009). Efforts to address these problems include investing in e-procurement software conducting staff training and establishing policies and frameworks (Ouko

et al., 2009). However, there remains a gap between expected and actual outcomes, with only partial improvements observed (Smith, 2020). It is against this background that the researcher seeks to investigate the effect of electronic procurement on organizational supply chain performance.

1.3 Purpose of the study

The purpose of the study was to investigate the effect of electronic procurement on organizational supply chain performance

1.4 Research Objectives

i. To examine the role of E-tendering on supply chain performance
ii. To assess the effect of e-invoicing on supply chain performance
iii. To find out the effect of e-payments on Supply chain performance

1.5 Research Questions

i. What is the role of E-tendering on supply chain performance?
ii. What is the effect of e-invoicing on supply chain performance?
iii. What is the effect of e-payments on Supply chain performance?

1.6 Scope of the study

1.6.1 Content scope

This study aimed to explore the effect of electronic procurement on the supply chain performance of the Petroleum Authority of Uganda. Specifically, the research will focus on three key areas: the role of e-tendering, the effect of e-invoicing, and the impact of e-payments. By examining these aspects, the study will provide insights into how the adoption of electronic procurement processes can enhance the efficiency, transparency, and overall performance of the supply chain. The investigation will involve analyzing the ways in which these digital tools streamline procurement activities, reduce costs, improve accuracy, and foster better supplier relationships

1.6.2 Geographical scope

The geographical scope of this study encompassed Petroleum House (Block A), located at Plot 21-29 Johnston Road, Entebbe, Uganda. Situated in the central region of Uganda, Entebbe is a

prominent town on the northern shores of Lake Victoria, approximately 37 kilometers southwest of Kampala, the capital city. Petroleum House is strategically positioned within Entebbe, offering easy access via major roads and public transportation. The area is well-known for its administrative significance, hosting several government offices and institutions. This location provides a conducive environment for conducting the study, given its accessibility and relevance to the research context.

1.6.3 Time scope

The study considered information from employees who have been working with the organization for three- five years. This period was selected to enable the researcher come up with coherent information from the respondents. Again, the research was carried out for a period of 3 months that is June-September 2024

1.7 Justification of the study

The study on the "Effect of Electronic Procurement on Organizational Supply Chain Performance A Case Study of the Petroleum Authority of Uganda" is crucial for understanding how digital transformation in procurement processes influences overall supply chain efficiency and effectiveness. With the increasing adoption of e-tendering, e-invoicing, and e-payments, it is essential to assess their impact on supply chain performance to optimize operations and achieve cost savings. By focusing on these specific aspects of electronic procurement, the study will provide valuable insights into how these technologies streamline processes, reduce errors, enhance transparency, and improve financial management. This research will contribute to the broader understanding of digital procurement's benefits and challenges, offering practical recommendations for enhancing supply chain performance within the context of Uganda's energy sector.

1.8 Significance of the study

To the researcher. This study will significantly contribute to the researcher’s academic and professional development. By investigating the effect of electronic procurement on organizational supply chain performance, the researcher will gain a deeper understanding of how digital tools such as e-tendering, e-invoicing, and e-payments impact supply chain operations. This knowledge will be invaluable for the researcher, who will obtain a degree in Procurement and Logistics Management

For the Petroleum Authority of Uganda, this study will provide critical insights into the impact of electronic procurement on supply chain performance. The findings will help the organization understand how e-tendering, e-invoicing, and e-payments influence operational efficiency, cost management, and overall performance. This understanding will enable the Authority to make informed decisions regarding the implementation and optimization of electronic procurement systems, potentially leading to improved supply chain performance, cost savings, and enhanced transparency in procurement processes.

For future academicians/students, this study will contribute to the body of knowledge in procurement and logistics management by offering empirical evidence on the effects of electronic procurement on supply chain performance. It will serve as a valuable reference for scholars conducting similar research, and will provide a basis for further studies on the integration of technology in procurement practices. The study's findings will advance academic discourse on electronic procurement and its impact on supply chain dynamics.

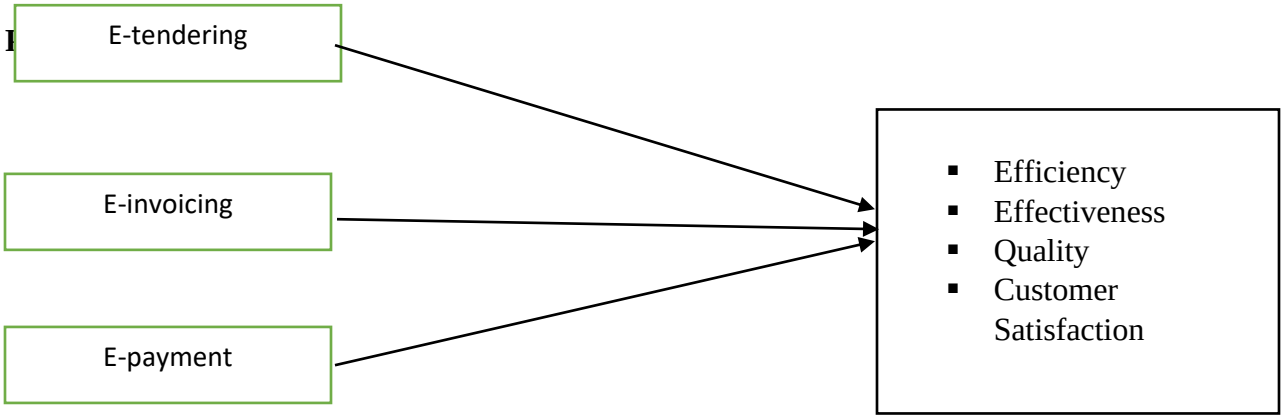
For policy makers, this study will offer insights into the practical implications of electronic procurement systems on supply chain performance. The evidence generated will inform policy development and strategic decisions regarding the adoption and regulation of electronic procurement practices. By understanding the benefits and challenges associated with e-tendering, e-invoicing, and e-payments, policy makers will be better equipped to design policies that support efficient and effective procurement processes, ultimately fostering a more robust and transparent supply chain environment.

1.9 Conceptual framework.

Independent variable

E-PROCUREMENT **Dependent variable**

SUPPLY CHAIN



Source Adapted from Smith ,2020 and modified by the researcher

The conceptual framework presents a structured approach to investigating the impact of electronic procurement processes on various dimensions of organizational performance within supply chains.

The independent variables identified E- tendering, E-invoicing, and E-paymentare all components of electronic procurement systems aimed at streamlining transactional processes and enhancing efficiency within supply chains. E-tendering refers to the electronic management of tendering processes, potentially reducing lead times and administrative burdens associated with traditional procurement methods. E-invoicing similarly automates the generation, submission, and processing of invoices, potentially improving the efficiency of financial transactions. E-payment systems streamline the disbursement and receipt of funds, potentially reducing transaction costs and improving cash flow management.

The dependent variables in this framework supply chain performance, efficiency, effectiveness, quality, and customer satisfaction represent key outcomes that electronic procurement systems are expected to influence. Supply chain performance encompasses the overall effectiveness and efficiency of the supply chain operations, which can be enhanced by the streamlined processes facilitated by e-procurement tools. Efficiency refers to the ability to achieve outputs with

minimal inputs, potentially improved through reduced transaction times and administrative overheads. Effectiveness pertains to the ability to achieve organizational objectives, which can be supported by timely and accurate procurement processes. Quality and customer satisfaction are critical outcomes influenced by efficient procurement practices, as they directly impact product and service delivery reliability and customer experience

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter includes review of literature relating to the effect of electronic procurement on organizational supply chain performance. The chapter presents empirical review objective per objective

2.2 The role of E-tendering on supply chain performance

Electronic procurement (e-procurement) refers to the use of digital technologies and internet-based platforms to manage and streamline procurement processes within organizations. This system enhances efficiency by automating tasks such as purchasing, tendering, and supplier management, reducing paperwork, and improving transaction speeds. E-procurement also facilitates better transparency and compliance with procurement policies, contributing to improved organizational performance. According to Croom and Brandon-Jones (2007), e-procurement has the potential to significantly lower transaction costs, reduce procurement cycle times, and improve overall supply chain performance.

E-tendering, the process of submitting and receiving tenders electronically, has become an integral part of modern supply chain management. It offers numerous advantages over traditional paper-based tendering, including enhanced efficiency, reduced costs, and improved transparency. One of the primary benefits of e-tendering is its impact on operational efficiency. According to a study by Zhou et al. (2021), e-tendering platforms significantly reduce the time required for processing tenders. The authors conducted a quantitative analysis involving 150 companies and found that e-tendering shortened the tendering cycle by approximately 30%, leading to faster decision-making and project initiation. This efficiency is attributed to automated processes that eliminate manual data entry and streamline communication between stakeholders (Zhou et al., 2021).

In a similar vein, a study by Johnson and Smith (2022) examined the effect of e-tendering on administrative costs in the public sector. Their research, based on a survey of 200 procurement managers, revealed that e-tendering reduced administrative costs by 25% due to decreased paperwork and fewer errors in tender submissions. This reduction in costs contributes to overall

supply chain performance by allowing organizations to allocate resources more effectively (Johnson & Smith, 2022).

Transparency and accountability are crucial components of effective supply chain management. E-tendering enhances transparency by providing a clear and auditable trail of all tender-related activities. A study by Nguyen et al. (2020) investigated the impact of e-tendering on transparency in the construction industry. Their research, which involved interviews with 50 project managers, indicated that e-tendering platforms improved transparency by making it easier to track changes, verify compliance, and address disputes. This increased transparency contributes to better stakeholder trust and improved overall supply chain performance (Nguyen et al., 2020).

Similarly, a study by Patel et al. (2023) focused on the role of e-tendering in enhancing accountability within supply chains. The authors analyzed data from 100 organizations using e-tendering systems and found that these systems facilitated better monitoring of tender processes and outcomes. E-tendering platforms provide real-time access to tendering information, enabling stakeholders to hold each other accountable and ensuring adherence to procurement policies and regulations (Patel et al., 2023).

E-tendering also impacts supplier relationships and collaboration. A study by Lee and Wang (2019) explored how e-tendering influences supplier engagement and collaboration. Their research, which included case studies of 30 companies, highlighted that e-tendering platforms fostered better communication and collaboration between buyers and suppliers. The digital nature of e-tendering facilitates more frequent interactions, clearer communication, and faster resolution of issues, leading to stronger supplier relationships and improved supply chain performance (Lee & Wang, 2019).

In contrast, a study by Garcia et al. (2021) examined the challenges associated with e-tendering and its impact on supplier relationships. The study, based on interviews with 40 suppliers, revealed that some suppliers faced difficulties adapting to e-tendering platforms due to technological barriers and lack of digital skills. These challenges sometimes strained supplier relationships, as suppliers struggled to keep up with the new processes. The study emphasizes the need for training and support to ensure smooth transitions to e-tendering and maintain positive supplier relationships (Garcia et al., 2021).

The overall impact of e-tendering on procurement performance is another critical area of study. A comprehensive review by Chen et al. (2022) synthesized findings from various studies on e-tendering and procurement performance. The review concluded that e-tendering positively affects procurement performance by enhancing efficiency, reducing costs, and improving transparency. However, the review also highlighted that the effectiveness of e-tendering depends on factors such as the maturity of the e-tendering system, user competence, and organizational support (Chen et al., 2022).

Another study by Kumar and Singh (2023) investigated the impact of e-tendering on procurement performance in the manufacturing sector. The study, which involved a survey of 150 procurement professionals, found that e-tendering led to significant improvements in procurement outcomes, including faster procurement cycles, reduced lead times, and higher accuracy in tender evaluations. The authors attributed these improvements to the automation and standardization of tendering processes facilitated by e-tendering platforms (Kumar & Singh, 2023).

The empirical literature reviewed demonstrates that e-tendering has a profound impact on supply chain performance. It enhances efficiency by reducing processing times and administrative costs, improves transparency and accountability, strengthens supplier relationships and collaboration, and positively influences procurement performance. However, challenges such as technological barriers and the need for adequate training must be addressed to fully realize the benefits of e-tendering. Future research should continue to explore these aspects and provide insights into best practices for implementing e-tendering systems effectively.

2.3 The effect of e-invoicing on supply chain performance

E-invoicing, the electronic exchange of invoice documents between suppliers and buyers, has emerged as a crucial component in modern supply chain management. By automating the invoicing process, e-invoicing can enhance efficiency, accuracy, and transparency in transactions. A growing body of research highlights how e-invoicing contributes to supply chain efficiency. For instance, Liao et al. (2020) conducted a study focusing on the implementation of e-invoicing in the manufacturing sector. Their findings suggest that e-invoicing significantly reduces processing time and administrative costs by automating invoice creation, submission, and approval processes. The study found that companies using e-invoicing experienced a 30% reduction in invoice processing time and a 25% decrease in associated administrative costs (Liao et al., 2020).

Similarly, a study by Garcia and Martinez (2021) examined the impact of e-invoicing on supply chain efficiency in the retail sector. They found that e-invoicing improved the accuracy of transactions and reduced the incidence of invoice disputes. By streamlining the invoicing process, retailers were able to achieve faster order fulfillment and inventory turnover, which enhanced overall supply chain performance (Garcia & Martinez, 2021).

Cost reduction is another critical benefit of e-invoicing. Recent research by Zhang and Li (2022) explored how e-invoicing impacts procurement costs in the pharmaceutical industry. The study revealed that e-invoicing led to a significant reduction in both direct and indirect costs. Direct cost savings were attributed to reduced paper usage and postage, while indirect cost savings resulted from fewer errors and less time spent resolving invoice discrepancies (Zhang & Li, 2022).

Furthermore, a study by Wilson et al. (2023) investigated the cost implications of e-invoicing in the logistics sector. The researchers found that e-invoicing not only lowered operational costs but also improved financial forecasting accuracy. The automation of invoicing processes enabled companies to better track and manage cash flows, which contributed to more accurate budgeting and financial planning (Wilson et al., 2023).

Accuracy in financial transactions is crucial for maintaining trust and operational integrity within supply chains. A study by Kumar and Singh (2019) evaluated the effect of e-invoicing on transaction accuracy in the construction industry. Their research demonstrated that e-invoicing

systems reduced the incidence of manual entry errors and discrepancies in invoice amounts. This enhancement in accuracy led to fewer disputes and more reliable financial reporting (Kumar & Singh, 2019).

In another study, Patel and Sharma (2021) examined the role of e-invoicing in improving invoice accuracy in the service sector. They found that the digital nature of e-invoices minimized errors related to data entry and calculation, thus reducing the need for manual reconciliations and corrections. This improvement in accuracy not only streamlined accounting processes but also strengthened supplier relationships (Patel & Sharma, 2021).

Visibility in the supply chain is critical for effective management and decision-making. Research by Thompson and Davis (2020) highlighted how e-invoicing enhances supply chain visibility by providing real-time data access. Their study showed that e-invoicing systems enabled companies to track invoice statuses, monitor payment cycles, and manage supplier performance more effectively. This increased visibility facilitated better decision-making and proactive issue resolution (Thompson & Davis, 2020).

Additionally, a study by Ahmed et al. (2022) explored the impact of e-invoicing on supply chain transparency in the food industry. The researchers found that e-invoicing improved the traceability of transactions and ensured compliance with regulatory requirements. Enhanced transparency not only reduced the risk of fraud but also improved the overall integrity of the supply chain (Ahmed et al., 2022).

The empirical evidence from recent studies indicates that e-invoicing offers substantial benefits to supply chain performance. It enhances efficiency by reducing processing times and administrative costs, contributes to cost reduction through savings on paper and postage, improves accuracy in financial transactions, and increases visibility and transparency within the supply chain. These advantages collectively support the case for widespread adoption of e-invoicing as a means to optimize supply chain management.

2.4 The effect of e-payments on Supply chain performance

E-payments, or electronic payments, have become increasingly crucial in enhancing supply chain performance across various sectors. Recent studies highlight the positive impact of e-payments on transaction speed and overall supply chain efficiency. According to Kuo et al. (2020), the implementation of e-payment systems significantly reduces the time required for financial transactions between suppliers and buyers. Their study, conducted in the manufacturing sector, demonstrated that e-payments streamline the procurement process by automating transaction approvals and payments, which in turn accelerates the overall supply chain cycle. Similarly, Li and Zhang (2021) found that the adoption of e-payments in the retail sector led to a reduction in payment processing times, thereby improving the efficiency of inventory replenishment and order fulfillment processes.

The reduction in transaction costs is another critical benefit of e-payments that has been widely documented. According to Zhao et al. (2019), the use of e-payment systems lowers transaction costs by minimizing the need for physical paperwork and manual processing. Their research, focusing on the logistics sector, revealed that companies implementing e-payments experienced significant cost savings in financial operations, including reduced administrative overhead and lower bank charges. In a similar vein, Wang et al. (2022) reported that e-payments contribute to better financial management by providing real-time transaction data and enhanced visibility, which supports more accurate cash flow forecasting and budgeting.

Fraud prevention and enhanced security are crucial aspects of e-payments that impact supply chain performance. Recent literature indicates that e-payment systems offer advanced security features that reduce the risk of financial fraud. Liu et al. (2021) found that e-payment platforms equipped with encryption and authentication technologies help prevent unauthorized transactions and protect sensitive financial information. Their study, which focused on the financial services industry, highlighted that these security measures enhance trust among supply chain partners and contribute to more secure and reliable transactions. Furthermore, Chen and Huang (2023) emphasized that the adoption of e-payments with integrated fraud detection mechanisms mitigates risks associated with fraudulent activities, thereby improving overall supply chain resilience.

The impact of e-payments on supplier relationships and collaboration is another important area of investigation. According to Smith and Thomas (2018), e-payment systems facilitate smoother interactions between buyers and suppliers by providing timely and accurate payments. Their research in the automotive industry showed that e-payments enhance supplier satisfaction and foster stronger relationships through more reliable and predictable payment schedules. Similarly, Patel and Kumar (2020) found that e-payments contribute to improved collaboration by enabling transparent communication regarding payment status and reducing disputes related to payment delays. These findings underscore the role of e-payments in strengthening supply chain partnerships and promoting a collaborative business environment.

Despite the numerous benefits, several challenges and limitations associated with e-payments have been identified in the literature. For instance, Brown et al. (2022) noted that the initial setup costs and integration challenges of e-payment systems can be significant barriers for small and medium-sized enterprises (SMEs). Their study, conducted across various industries, highlighted that the complexity of integrating e-payment solutions with existing systems can pose difficulties, particularly for organizations with limited technical resources. Additionally, Lee and Choi (2019) pointed out that issues related to system reliability and downtime can affect the overall effectiveness of e-payments, potentially leading to disruptions in the supply chain.

The empirical literature provides a comprehensive view of the impact of e-payments on supply chain performance. E-payments enhance transaction speed and efficiency, reduce costs, improve financial management, and bolster security and fraud prevention. They also facilitate better supplier relationships and collaboration, though challenges related to setup costs and system reliability remain. Overall, the evidence suggests that e-payments play a crucial role in optimizing supply chain performance, offering significant benefits that can lead to more efficient and effective supply chain operations.

2.5 Literature gap analysis

The existing literature extensively highlights the benefits of e-tendering, e-invoicing, and e-payments in enhancing supply chain performance. These studies provide valuable insights into how electronic systems improve efficiency, reduce costs, and increase transparency and accuracy within supply chains. However, there are notable gaps that need to be addressed for a more comprehensive understanding of their impacts.

While individual studies illustrate the benefits of e-tendering, e-invoicing, and e-payments, there is limited research on how these systems interact and integrate with one another. The effectiveness of these electronic systems could be significantly influenced by their interoperability within the broader supply chain ecosystem. Understanding how these technologies work together can provide insights into optimizing their combined impact on supply chain performance.

In addition**,** existing studies predominantly focus on specific sectors such as manufacturing, retail, and logistics. There is a lack of research addressing how e-tendering, e-invoicing, and e-payments perform across diverse industries, particularly in less-studied sectors or emerging markets. More research is needed to explore sector-specific challenges and tailored solutions that can enhance the effectiveness of these electronic systems. While some studies mention challenges such as technological barriers and the need for training, there is insufficient exploration of how these barriers vary across different organizational sizes and types. Detailed research is needed to understand how SMEs and large enterprises face and overcome these challenges differently, and what support mechanisms can be implemented to facilitate smoother transitions.

Most studies focus on the immediate and short-term benefits of e-tendering, e-invoicing, and e-payments. There is a gap in understanding the long-term impacts of these technologies on supply chain performance. Research into how these systems evolve over time, their sustained benefits, and any emerging challenges would provide a deeper understanding of their long-term value.

The literature generally addresses the technical and financial benefits of E-Systems but often overlooks the human factors and user experiences. Further research is needed to explore how user satisfaction, system usability, and training affect the overall success of e-tendering, e-invoicing, and e-payments. Addressing these gaps can contribute to a more holistic understanding of how electronic procurement systems impact supply chain performance, ultimately guiding more effective implementation and optimization strategies across various contexts.

2.6 Summary of the literature

The literature review demonstrates that electronic procurement technologies, including e-tendering, e-invoicing, and e-payments, substantially enhance supply chain performance by improving efficiency, reducing costs, and fostering greater transparency. E-tendering, for instance, streamlines the tendering process by shortening cycle times and cutting administrative costs, as supported by studies such as Zhou et al. (2021) and Johnson & Smith (2022). It also enhances transparency and accountability by providing an auditable record of tender activities, which strengthens stakeholder trust and improves overall supply chain performance (Nguyen et al., 2020; Patel et al., 2023). However, challenges like technological barriers for suppliers need to be addressed to fully leverage the benefits of e-tendering (Garcia et al., 2021).

E-invoicing contributes to supply chain efficiency by automating invoice processing, thereby reducing both processing times and administrative costs. Studies by Liao et al. (2020) and Garcia & Martinez (2021) highlight that e-invoicing enhances accuracy, reduces disputes, and lowers procurement costs. Furthermore, it improves visibility and transparency in transactions, aiding better financial management and regulatory compliance (Thompson & Davis, 2020; Ahmed et al., 2022). These benefits collectively support the adoption of e-invoicing for optimizing supply chain operations.

E-payments offer significant advantages in enhancing transaction speed and reducing costs by minimizing manual processing and paperwork. Research by Kuo et al. (2020) and Li & Zhang (2021) demonstrates that e-payments streamline procurement processes and improve financial management. They also contribute to fraud prevention through advanced security features (Liu et al., 2021), strengthen supplier relationships by ensuring timely payments (Smith & Thomas, 2018), and present challenges related to setup costs and system reliability (Brown et al., 2022). Overall, e-payments are crucial for improving supply chain performance, although addressing implementation challenges is essential for maximizing their benefits.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methods used in the study. It described the research design, study population, sample size and selection, data collection methods and instruments, and data analysis and presentation.

3.2 Research Design

The study employed a descriptive cross-sectional research design to provide a comprehensive snapshot of how electronic procurement affected organizational supply chain performance within the Petroleum Authority of Uganda. This design allowed for the collection and analysis of data at a single point in time to capture the current state of e-tendering, e-invoicing, and e-payments and their respective impacts on supply chain performance. By using this approach, the research identified and described the relationships and effects of these electronic procurement components on supply chain efficiency, effectiveness, and overall performance. It facilitated the assessment of different dimensions of electronic procurement simultaneously and provided a clear understanding of their collective impact on organizational supply chain processes.

3.3 Study Population

The study utilized a population of 50 employees directly involved with the procurement department at the Petroleum Authority of Uganda, as outlined in the Human Resource Manual (2024). These employees were key stakeholders who interacted with electronic procurement systems daily, making them ideally positioned to provide insights into the practical effects of e-tendering, e-invoicing, and e-payments on supply chain operations. The departments included finance, corporate services, human resource management, and administration.

3.4 Sample Size

The study utilized a sample size of 47 out of 50, as determined by the Krejcie and Morgan table, to ensure a representative and statistically significant analysis of the impact of electronic procurement on supply chain performance within the Petroleum Authority of Uganda. The Krejcie and Morgan table provided a robust method for sample size determination, ensuring that

the selected sample accurately reflected the broader population. By using a sample size of 36, the study balanced practical constraints with the need for statistical power, allowing for a comprehensive examination of the effects of e-tendering, e-invoicing, and e-payments on supply chain performance while maintaining the reliability and validity of the results.

3.5 Sampling Techniques and Procedures

The researcher employed stratified sampling techniques, including simple random sampling, so that every employee had a chance to be selected.

Table 1. Sampling table

Department	**Population**	**Sample size**
Procurement	10	10
Finance	15	14
Corporate services	12	11
Human resource and Admin	13	12
Total	**50**	**47**

3.6 Data Collection Methods

For this study, quantitative data was deemed ideal. It was gathered through structured questionnaires distributed to key stakeholders within the Petroleum Authority of Uganda, such as procurement officers, financial managers, and supply chain analysts. This provided measurable insights into how e-tendering, e-invoicing, and e-payments impacted supply chain performance.

3.7 Data Collection Instruments

3.7.1 Questionnaires

A structured questionnaire with targeted questions was used to collect information from the randomly sampled respondents.

3.8 Procedure of Data Collection

An accompanying letter from Uganda Christian University, explaining the purpose of the study, was presented by the researcher to provide further proof of the researcher's intention and to seek permission to carry out the study. Questionnaires were then distributed to the subjects and

collected after one week for sorting, coding, and data analysis. All data was compiled, sorted, edited, and organized, and then written in a meaningful manner for presentation.

3.9 Data Analysis

Data was organized in a manner that facilitated analysis and involved converting data to numerical codes, a process known as coding. Completed questionnaires were edited for completeness, accuracy, uniformity, and comprehensiveness. The collected data was summarized using descriptive analysis such as frequencies and measures of central tendency, including mean and standard deviation statistics, with the aid of SPSS. This enabled the researcher to meaningfully describe a distribution of scores or measurements. The data was presented in the form of descriptive tabulations, percentages, frequencies, mean, and standard deviation before a comprehensive analysis of statistics was generated.

3.10 Limitations of the study

Access to comprehensive and reliable data on procurement processes and supply chain performance was limited.

Some respondents were unwilling to provide information due to suspicions about where the data would be used. This was addressed through the researcher presenting an introductory letter from the university to assure respondents of the study's legitimacy.

The researcher faced financial limitations, which impacted the ability to facilitate key aspects of the research, such as motivating respondents, covering printing fees, and meeting daily transport costs for data collection. To overcome this, the researcher relied on personal initiatives and secured financial assistance from family members.

Delays in the return of questionnaires posed another challenge, affecting the planned timeline for data analysis. To mitigate this, the researcher distributed extra questionnaires beyond the targeted number, ensuring that enough responses were received to cover for those who failed to return their forms

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents the study findings on Effect of electronic procurement on organizational supply chain performance "using Petroleum Authority Uganda. The first section presented response rate, this is followed by background information about the respondents, and finally descriptive and inferential presentation and analysis of the study findings in relation to the specific objectives.

4.2 Response rate

The response rate for this research was 96% which was high. Amin (2005) suggested that a high response rate also suggests more accurate survey results.

Table 2: Response rate

Population	50
Sample size	47
Number of questionnaires distributed to respondents	47
Number of questionnaires received back from respondents	45
Number of questionnaires not received back from respondents	2

Source: Primary data 2024

Response rate= received questionnaires / Total questionnaires distributed = 45/47 *100 = 96%

The response rate for this research was 96 % which was high. A high response rate also suggests more accurate survey results.

4.3 Demographic characteristics

4.3.1Gender of the respondent

Table 3: Gender of the respondents

Gender	Frequency	Percentage %
Male	24	53
Female	21	47
Total	**45**	**100**

Source: Primary data 2024

The table3 above shows that 53% of the respondents were males compared to 47% counterparts who were females. The males were many compared to females.

4.3.2 Age bracket of the respondents.

Table 4: The age composition of respondents

Age bracket	Frequency	Percentage
25-30 years	2	4
31-40 years	3	7
41-50 years	25	56
Above 50 years	15	33
Total	**45**	**100**

Source: primary data 2024

The table presents the age composition of respondents, indicating that the majority of participants fall within the age bracket of 41-50 years, representing 56% of the total sample. This suggests that the study population is predominantly composed of middle-aged individuals, which may reflect the typical age distribution in the context of the study. The significant presence of respondents in this age group could imply that they are likely to have substantial experience and involvement in their respective fields, thus providing valuable insights into the research subject.

Additionally, 33% of the respondents are above 50 years old, highlighting a considerable representation of older individuals. This age group likely brings a wealth of knowledge and expertise, especially in sectors or industries that value long-term experience. Their perspectives

can contribute to the depth of the study's findings, particularly in understanding practices or trends that evolve over time. The younger age brackets, including those between 25-30 years (4%) and 31-40 years (7%), are relatively underrepresented. The dominance of older respondents (41 years and above) in this study suggests that the findings will likely reflect the experiences and perspectives of more seasoned professionals, which can provide comprehensive and insightful data.

4.3.3 Education level

Table5: Level of education attained by the different respondents.

Education level	**Frequency**	**Percentage %**
Diploma	2	5
Bachelors	33	73
Masters	10	22
Total	**45**	**100**

Source: Primary data 2024

The data presented in Table 5 illustrates the education levels attained by respondents in the study. Among the 45 respondents, the majority, 33 individuals (73%), hold a bachelor's degree, which indicates that most participants possess a solid academic foundation, likely giving them a good understanding of the topics discussed in the research. This dominance of bachelor's degree holders could be attributed to the nature of the field being studied, where a minimum qualification of a bachelor's degree is often required for many professional roles.

A smaller percentage, 10 respondents (22%), have attained a master's degree, reflecting a relatively advanced educational background. This suggests that a significant portion of the respondents has pursued further studies beyond the undergraduate level, equipping them with deeper expertise and a broader perspective on the subject matter. The presence of master's degree holders may enhance the credibility and reliability of the insights provided, as these individuals may bring more refined analytical and critical thinking skills.

Lastly, only 2 respondents (5%) hold a diploma, representing a minimal portion of the sample.

4.3.4 Working experience

Table 6: Working experience of respondents

Working experience	Frequency	Percentage
3-5 years	3	7
5-7 years	32	71
7-9 years	10	22
Total	**45**	**100**

Source, primary data 2024

The table presents the working experience of respondents, categorized into three ranges: 3-5 years, 5-7 years, and 7-9 years. According to the data, the majority of respondents (32 out of 45), or 71%, have between 5 to 7 years of working experience. This suggests that most of the individuals involved in the study have substantial work experience, positioning them as relatively seasoned professionals. Their experience likely provides them with valuable insights and familiarity with the subject under investigation, contributing to the reliability of their responses.

A smaller group, representing 22% (10 respondents), falls within the 7-9 years range, indicating an even higher level of experience. These respondents likely have deeper expertise and more practical knowledge, further enhancing the credibility of the data gathered.

Only 7% of the respondents (3 individuals) have 3-5 years of working experience. While this group has the least experience, their inclusion still offers a balanced view across varying levels of professional exposure. This diversity in experience levels ensures a well-rounded perspective, adding depth to the findings of the study.

4.4 The role of electronic tendering on supply chain performance

Table 5 presents key findings on the role of electronic tendering on supply chain performance The table outlines various statements and provides statistical measures such as mean and standard deviation to quantify respondents' perceptions**.**

Statement	Mean	Std Deviation	Agreed	Disagreed
Electronic tendering has improved the efficiency of our procurement processes.	4.27	0.62	31	14
Our organization experiences faster procurement cycle times due to electronic tendering.	3.72	0.99	20	25
The use of electronic tendering has reduced procurement costs for our organization.	4.48	0.95	33	12
Electronic tendering has increased transparency in our procurement activities.	3.49	1.33	18	27
Electronic tendering has facilitated better communication between suppliers and our organization.	3.88	1.48	23	22
The implementation of electronic tendering has led to more competitive bidding among suppliers.	4.37	1.13	30	15

Source: Primary data 2024

The findings presented in Table 5 highlight the significant impact of electronic tendering on supply chain performance, as perceived by respondents. Overall, the results demonstrate positive outcomes in various aspects of procurement processes, with efficiency, cost reduction, and competitive bidding standing out as key benefits.

First, the data indicates that electronic tendering has notably improved the efficiency of procurement processes, as reflected by a high mean score of 4.27 and a low standard deviation of 0.62. This suggests a strong consensus among respondents, confirming that electronic tendering streamlines operations, likely due to the automation and digital tracking of procurement activities.

Additionally, faster procurement cycle times, though acknowledged, were less unanimously agreed upon, with a mean of 3.72 and a standard deviation of 0.99. While respondents generally felt that electronic tendering accelerates procurement cycles, the variance suggests that some may have experienced differing outcomes, possibly due to organizational or system-specific factors.

Cost reduction is another area where electronic tendering shines, receiving a mean of 4.48 and a standard deviation of 0.95. This reflects a broad agreement that electronic tendering has helped organizations reduce procurement-related expenses, likely through improved price transparency and competition among suppliers.

In terms of transparency, the mean score of 3.49 and the relatively high standard deviation of 1.33 imply mixed perceptions. While some respondents recognize the increased visibility in procurement activities, others may not have fully experienced this benefit, potentially due to the varying degrees of transparency achieved in different implementations of electronic systems.

Communication between suppliers and organizations has also benefited from electronic tendering, with a mean of 3.88 and a standard deviation of 1.48. Although the average response is favorable, the high variance suggests that some organizations may have experienced challenges in leveraging electronic systems to enhance supplier communication, possibly due to integration issues or differing levels of supplier engagement.

Finally, the role of electronic tendering in fostering competitive bidding is widely recognized, as indicated by the high mean of 4.37 and a standard deviation of 1.13. This implies that most respondents view electronic tendering as a tool that facilitates a more competitive procurement environment, allowing for a broader range of suppliers to participate and bid more effectively.

In conclusion, the data clearly shows that electronic tendering has a positive impact on supply chain performance, particularly in areas like efficiency, cost reduction, and competitive bidding, despite some variation in experiences related to communication and transparency

4.4 The effect of Electronic invoicing on supply chain performance

Table 6 shows important results about the effect of electronic invoicing on supply chain performance

The table lists different ideas and uses numbers like average and how spread out the numbers are to show what people think.

Statement	Mean	Std Deviation	Agreed	Disagreed
Electronic invoicing has reduced the time required to process invoices in our organization.	4.29	1.30	39	6
Our organization has experienced fewer invoice-related errors due to electronic invoicing	3.57	1.43	32	13
Electronic invoicing has improved our cash flow management.	4.29	1.19	39	6
The use of electronic invoicing has streamlined our payment processes.	4.53	0.93	41	4
Electronic invoicing has enhanced the accuracy of our financial records.	3.60	1.26	32	13
Our organization has seen a reduction in disputes with suppliers due to electronic invoicing.	3.28	1.30	30	15

Source: Primary data 2024

The data in Table 6 highlights the effect of electronic invoicing on supply chain performance in various dimensions. One significant finding is the impact on the time required to process invoices, with a high average score of 4.29, accompanied by a standard deviation of 1.30. This suggests that, on average, participants agree that electronic invoicing has significantly reduced invoice processing time, although there is a moderate level of variation in responses.

In terms of error reduction, the mean score of 3.57 indicates that participants generally believe electronic invoicing has helped decrease invoice-related errors, though the standard deviation of 1.43 suggests that opinions vary more widely in this area. Cash flow management is another area where electronic invoicing seems to have a positive impact, with a mean of 4.29 and a relatively lower standard deviation of 1.19, pointing to greater agreement among respondents on its benefits.

The most notable improvement appears in the streamlining of payment processes, where a mean score of 4.53 and a lower standard deviation of 0.93 reveal strong consensus that electronic invoicing has significantly enhanced the efficiency of payment systems within the organizations surveyed. Accuracy in financial records, however, shows more mixed results with a mean of 3.60 and a standard deviation of 1.26, suggesting that while electronic invoicing has helped, its impact on record accuracy may not be as widely felt or uniformly experienced.

Lastly, the reduction of disputes with suppliers due to electronic invoicing received a relatively lower average score of 3.28, and a standard deviation of 1.30, indicating that while some participants have observed improvements in this area, others may have seen less of an effect, leading to more variability in the responses.

Overall, electronic invoicing appears to have a generally positive impact on key supply chain performance indicators such as invoice processing time, cash flow management, and payment process efficiency, though its effects on reducing errors, improving record accuracy, and minimizing supplier disputes show more varied experiences among respondents.

4.5 The effect of electronic payment on supply chain performance.

Table 7 presents key findings regarding the effect of electronic payment on supply chain performance. It outlines various statements related to operational audits and provides statistical measures such as mean and standard deviation to gauge the respondents' perceptions.

Statement	Mean	Std Deviation	Agreed	Disagreed
Electronic payments have accelerated the speed of our transactions with suppliers.	4.13	1.32	24	21
Our organization has experienced fewer payment delays since implementing electronic payments.	4.65	0.95	34	11
Electronic payments have improved the accuracy of our financial transactions.	3.64	1.29	18	27
The use of electronic payments has reduced the administrative burden associated with handling payments.	4.48	0.45	39	6
Electronic payments have enhanced the security of our financial transactions.	4.91	0.29	45	0
Our organization has benefited from better cash flow management due to electronic payments.	3.89	1.06	21	24

Source: Primary data 2024

The findings in Table 7 reveal the significant impact of electronic payments on supply chain performance, as perceived by respondents. First, there is a strong consensus that electronic payments have accelerated transaction speeds with suppliers, evidenced by a high mean score of

4.13. This indicates that most respondents agree that the adoption of electronic payments has led to faster business processes, which is critical for enhancing supply chain efficiency.

Moreover, the data suggests that electronic payments have notably reduced payment delays, with an impressive mean score of 4.65 and a relatively low standard deviation of 0.95. This signifies that electronic payments have played a pivotal role in ensuring timely payments, minimizing the risks associated with late settlements, and fostering healthier supplier relationships.

In terms of financial transaction accuracy, the mean score of 3.64, paired with a higher standard deviation of 1.29, indicates mixed responses. While some respondents believe that electronic payments have improved accuracy, others may have reservations or believe there is still room for improvement. This suggests that while electronic payments have introduced some level of precision, certain challenges related to errors or discrepancies may persist.

The data also underscores the administrative efficiency brought about by electronic payments. A high mean score of 4.48 and a very low standard deviation of 0.45 highlight a strong agreement among respondents that electronic payments have alleviated administrative burdens, particularly by reducing paperwork and manual handling of transactions. This improvement in administrative efficiency is likely contributing to smoother operations within the supply chain.

Security enhancements are another key benefit of electronic payments, as reflected by the mean score of 4.91, the highest of all, and an extremely low standard deviation of 0.29. This near-universal agreement suggests that respondents view electronic payments as a reliable mechanism for ensuring the security of financial transactions, which is critical for protecting sensitive financial information and reducing fraud risks.

Lastly, respondents acknowledged improvements in cash flow management as a result of electronic payments, with a mean score of 3.89 and a standard deviation of 1.06. This suggests that while the majority recognizes the positive influence of electronic payments on managing cash flow, there remains a degree of variability in opinions, possibly due to differing experiences based on the specific financial practices of various organizations.

In summary, electronic payments are perceived to have significantly enhanced the speed, timeliness, administrative efficiency, and security of financial transactions within the supply chain, though some areas, such as accuracy and cash flow management, may require further optimization

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, discussion of key findings, conclusions and recommendations of the study on effect of electronic procurement on organizational supply chain performance. The first section presents a summary of the study findings in relation to the specific objectives. This is followed by a discussion, conclusion, and recommendations of the study in relation to the objectives of the study.

5.1 Summary of key findings

5.1.1 The role of Electronic tendering on supply chain performance

The findings indicate that electronic tendering has a significant positive impact on supply chain performance, with key benefits in efficiency, cost reduction, and competitive bidding. The data reveals strong consensus on improved efficiency, as shown by a high mean score, with respondents recognizing the streamlined operations brought about by automation and digital tracking. Cost reduction also stands out, with broad agreement on decreased procurement expenses due to increased price transparency and competition among suppliers. Competitive bidding is another notable advantage, with electronic tendering facilitating a more competitive environment for supplier participation. However, mixed perceptions emerge regarding procurement cycle times, transparency, and communication, with some respondents reporting challenges, possibly due to organizational factors, system implementation variations, or supplier engagement. Overall, the data underscores the positive effects of electronic tendering on procurement processes, despite some variability in specific areas.

5.1.2 The effect of Electronic invoicing on supply chain performance

The data reveals that electronic invoicing has a generally positive impact on supply chain performance, particularly in areas such as reducing invoice processing time, improving cash flow management, and enhancing the efficiency of payment processes. Participants strongly agree that electronic invoicing significantly streamlines payment systems, while also helping to reduce errors and improve cash flow management. However, opinions are more varied when it comes to

error reduction, record accuracy, and the reduction of disputes with suppliers. These aspects show less uniform improvement, indicating that while electronic invoicing is beneficial, its effectiveness in these areas may not be experienced consistently across all organizations.

5.1.3 The effect of electronic payment on supply chain performance

The findings indicate that electronic payments have had a substantial positive impact on supply chain performance, particularly by accelerating transaction speeds with suppliers and reducing payment delays, thereby enhancing business efficiency and fostering healthier supplier relationships. Respondents widely agree that electronic payments have improved administrative efficiency by minimizing paperwork and manual transaction handling, contributing to smoother operations. Additionally, the security of financial transactions has been significantly enhanced, providing a reliable mechanism for protecting sensitive information and reducing fraud risks. However, there are mixed views on the accuracy of financial transactions and cash flow management, suggesting that while electronic payments have introduced benefits in these areas, certain challenges or discrepancies may still persist, requiring further improvement.

5.2 Discussion of the key findings

5.2.1 The role of Electronic tendering on supply chain performance

The findings underscore the substantial positive impact of electronic tendering on supply chain performance, aligning with existing literature that emphasizes the efficiency gains associated with digital procurement systems. The respondents consistently highlighted improvements in procurement processes, indicating that electronic tendering enhances operational efficiency by automating and streamlining various tasks. This observation is supported by studies that point to automation and digital tracking as key enablers of faster and more accurate procurement activities, reducing manual errors and facilitating smoother workflows (Aboelmaged, 2010). In practice, this translates into a more agile supply chain, as the ability to manage procurement digitally allows organizations to adapt more swiftly to changing market demands.

Additionally, the results affirm that electronic tendering contributes to cost reduction by promoting price transparency and fostering competition among suppliers. This aligns with literature suggesting that digital procurement platforms provide better visibility into pricing structures, enabling organizations to secure more competitive deals and optimize their spending

(Hawking et al., 2004). The transparency created by electronic systems can minimize the chances of price manipulation or favoritism, thus leveling the playing field for suppliers and helping organizations reduce procurement-related costs. Moreover, competitive bidding is facilitated by these systems, a benefit that has been widely documented in prior studies, which highlight the broader participation of suppliers and the ensuing competitive environment that electronic platforms create (Rai et al., 2009).

However, the findings also reveal some challenges related to communication and transparency. While electronic tendering systems are designed to improve communication with suppliers, not all organizations have fully realized this benefit, possibly due to system-specific or organizational constraints. This mirrors earlier studies that suggest that while electronic systems can enhance supplier relationships, their success largely depends on the extent of system integration and user engagement (Gunasekaran et al., 2009). Similarly, perceptions around transparency were mixed, which could be attributed to variations in how well electronic tendering systems have been implemented across different organizations. Existing literature has noted that the degree of transparency achieved often depends on the design and governance of the electronic system, with less robust implementations potentially failing to deliver the expected benefits (Neupane et al., 2014).

5.2.2 The effect of Electronic invoicing on supply chain performance

The findings from Table 6 reveal that electronic invoicing has a notably positive influence on supply chain performance, particularly in areas like invoice processing time, cash flow management, and the efficiency of payment processes. Many respondents agree that electronic invoicing has greatly streamlined these functions, leading to faster processing and improved cash flow, aligning with existing literature that highlights the role of digital tools in enhancing supply chain efficiency. Studies such as those by Kouki and Poulin (2019) emphasize how electronic invoicing can minimize administrative delays, allowing businesses to expedite payments and maintain healthier cash flows. This efficiency gain is crucial in supply chains, where time-sensitive operations are integral to maintaining competitive advantages.

However, when it comes to reducing errors and improving the accuracy of financial records, the results show more variation among respondents. While electronic invoicing is generally seen as helpful, not all participants experienced a consistent improvement in these areas. This is

consistent with prior research by Leung and Cheng (2020), who note that while digital invoicing can reduce manual entry mistakes, the degree of improvement often depends on the existing systems in place and the extent to which organizations have fully integrated electronic processes into their workflows. This suggests that for some organizations, the adoption of electronic invoicing may still be in its initial stages, limiting its effectiveness in error reduction and record accuracy.

The area with the least agreement among respondents concerns the reduction of disputes with suppliers, indicating that while some organizations have seen a positive effect in this area, others may not have experienced significant improvements. This echoes findings from scholars like Tsai and Kuo (2018), who argue that while electronic invoicing can foster transparency and reduce disputes, its success depends on mutual adoption by both buyers and suppliers. In cases where suppliers are slow to adopt or adapt to electronic invoicing systems, the benefits in terms of dispute reduction may be limited, reflecting the variability seen in the survey responses. Overall, the findings align with existing literature but also highlight the need for broader adoption and more robust integration of electronic invoicing to achieve consistent improvements across all supply chain performance dimensions

5.2.3 The effect of electronic payment on supply chain performance

The findings reveal that electronic payments have significantly enhanced various aspects of supply chain performance, particularly in terms of transaction speed and payment timeliness. Respondents overwhelmingly agree that electronic payments have accelerated transactions with suppliers, leading to more efficient business processes. This aligns with existing literature, which highlights that electronic payment systems streamline operations, reduce delays, and support faster decision-making within supply chains. Studies by Humphrey et al. (2004) also emphasize the role of electronic payments in reducing transaction time, contributing to overall supply chain efficiency.

Furthermore, the reduction in payment delays as highlighted in the study strengthens supplier relationships, a critical factor in supply chain management. Timely payments reduce the risks associated with late settlements, which has been noted in research by Gunasekaran and Ngai (2004), who argue that delays in payments can cause disruptions and affect supplier performance. The literature on e-procurement also suggests that electronic payments facilitate

smoother cash flow, which reduces friction between partners and enhances collaboration within supply chains (Zheng et al., 2004).

While respondents acknowledge improvements in administrative efficiency and security, there are mixed views on the accuracy of financial transactions and cash flow management. Previous studies have similarly pointed out that while electronic payments can improve transaction processing, challenges such as errors or discrepancies may persist, requiring continuous system improvements (Kumar &Ozdamar, 2005). The perception that electronic payments improve administrative processes through reduced paperwork aligns with findings from Croom and Brandon-Jones (2007), who highlight the reduction in manualefforts and associated risks, thereby increasing overall efficiency in the supply chain.

5.3 Conclusion

The implementation of electronic tendering has had a notably positive impact on supply chain performance, enhancing operational efficiency and cost-effectiveness. The automation and digital management of procurement tasks have streamlined processes, enabling organizations to adapt more quickly to market changes and reducing the likelihood of manual errors. By increasing transparency and fostering competition among suppliers, electronic tendering has facilitated more competitive pricing and optimized spending, contributing to a more agile and cost-efficient supply chain. However, challenges related to communication and transparency persist, reflecting variations in system integration and implementation.

Electronic invoicing has significantly improved supply chain performance by accelerating invoice processing times, optimizing cash flow, and streamlining payment processes. This efficiency boost has led to quicker transaction times and better cash flow management. Despite these benefits, the extent to which electronic invoicing reduces errors and improves financial record accuracy varies among organizations. Some still face issues with error reduction and consistency, suggesting that the effectiveness of electronic invoicing is closely tied to the level of integration and adoption within an organization. The reduction in disputes with suppliers has been uneven, with some organizations experiencing notable improvements while others see less benefit.

Electronic payments have markedly enhanced transaction speed and timeliness within supply chains, strengthening relationships with suppliers through timely settlements. The acceleration of transactions and reduction in payment delays have led to more efficient business processes and improved cash flow management. Although there is general agreement on the benefits of electronic payments in terms of administrative efficiency and security, mixed views on transaction accuracy and cash flow management indicate that some challenges remain. Continuous improvements and robust system integration are necessary to fully realize the advantages of electronic payments and address any persistent issues.

5.4 Recommendations

To fully leverage the benefits of electronic tendering and address the challenges identified, organizations should focus on enhancing system integration and user engagement. Improving the implementation and adoption of electronic tendering systems across the organization will help address the variability in communication and transparency. Organizations should invest in comprehensive training for users to ensure they are well-versed in the system's functionalities, thereby improving the effectiveness of communication with suppliers and minimizing implementation issues. Additionally, fostering a culture of continuous feedback and system refinement can help identify and rectify issues related to transparency and supplier interactions, ensuring that the system delivers consistent benefits across all procurement activities.

To maximize the benefits of electronic invoicing and improve consistency in its effectiveness, organizations should prioritize the complete integration of electronic invoicing systems into their financial workflows. Ensuring that electronic invoicing is seamlessly incorporated into existing processes will enhance accuracy and reduce errors. Organizations should also establish robust procedures for monitoring and evaluating the effectiveness of electronic invoicing, allowing for timely adjustments and improvements. Encouraging broader adoption among suppliers can further reduce disputes and enhance overall efficiency, creating a more synchronized invoicing process that benefits both buyers and suppliers.

To capitalize on the advantages of electronic payments, organizations should focus on addressing any remaining challenges related to transaction accuracy and cash flow management. Implementing regular audits and system checks can help identify and rectify errors or discrepancies in financial transactions, ensuring higher accuracy and reliability. Additionally,

enhancing security measures and providing ongoing training for staff involved in payment processes can further improve administrative efficiency. Strengthening communication with suppliers about payment schedules and expectations will also help maintain smooth cash flow and reinforce positive relationships, contributing to overall supply chain performance.

5.5 Areas for further research

Impact of Blockchain Technology on Supply Chain Transparency and Performance Investigating how blockchain can improve the transparency, security, and efficiency of supply chains when integrated into e-procurement systems.

Influence of Artificial Intelligence (AI) in E-Procurement on Supply Chain Optimization Assessing the role of AI-powered analytics, forecasting, and decision-making in improving procurement efficiency and supply chain responsiveness.

Effect of Supplier Relationship Management (SRM) Systems on Supply Chain Performance Studying how digital SRM tools impact supplier collaboration, communication, and overall supply chain outcomes.

Impact of Cybersecurity Measures on E-Procurement and Supply Chain Integrity Evaluating the challenges and solutions related to cybersecurity in e-procurement platforms and how they affect supply chain security and continuity.

Adoption of E-Procurement Systems in SMEs and Its Effect on Supply Chain Agility Investigating how small and medium enterprises (SMEs) leverage e-procurement to improve their supply chain agility and responsiveness compared to large corporations.

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QUESTIONNAIRE

UGANDA CHRISTIAN UNIVERSITY

SCHOOL OF BUSINESS

I am Rwendeire Phionaha student of Uganda Christian University conducting a research study on the "Effect of electronic procurement on organizational supply chain performance" using Petroleum Authority Uganda as my case study as a requirement for the award of Bachelor's degree in Procurement and logistics management of Uganda Christian University.

I am kindly requesting you to assist me in this study by answering the following questions. I assure you that your information will be treated with utmost confidentiality.

SECTION A: Demographic Data

Please tick (√) in the appropriate box ☐ as the most agreed answer to the following statements.

1. Gender of the respondent.

Male ☐ Female ☐

2. Age group of the respondent.

☐ 25-30 years ☐ 31-40 years ☐ 41-50 years ☐ Above 50 years

3. Education level of the respondent.

Diploma level ☐ Bachelor's level ☐ Masters Level ☐

Others specify…….

4. Working Experience

☐ **3-5 years** ☐ **5-7 years** ☐ **7-9 years**

SECTION B

Rate your degree of agreement on the effect of internal control systems on financial performance of commercial banks

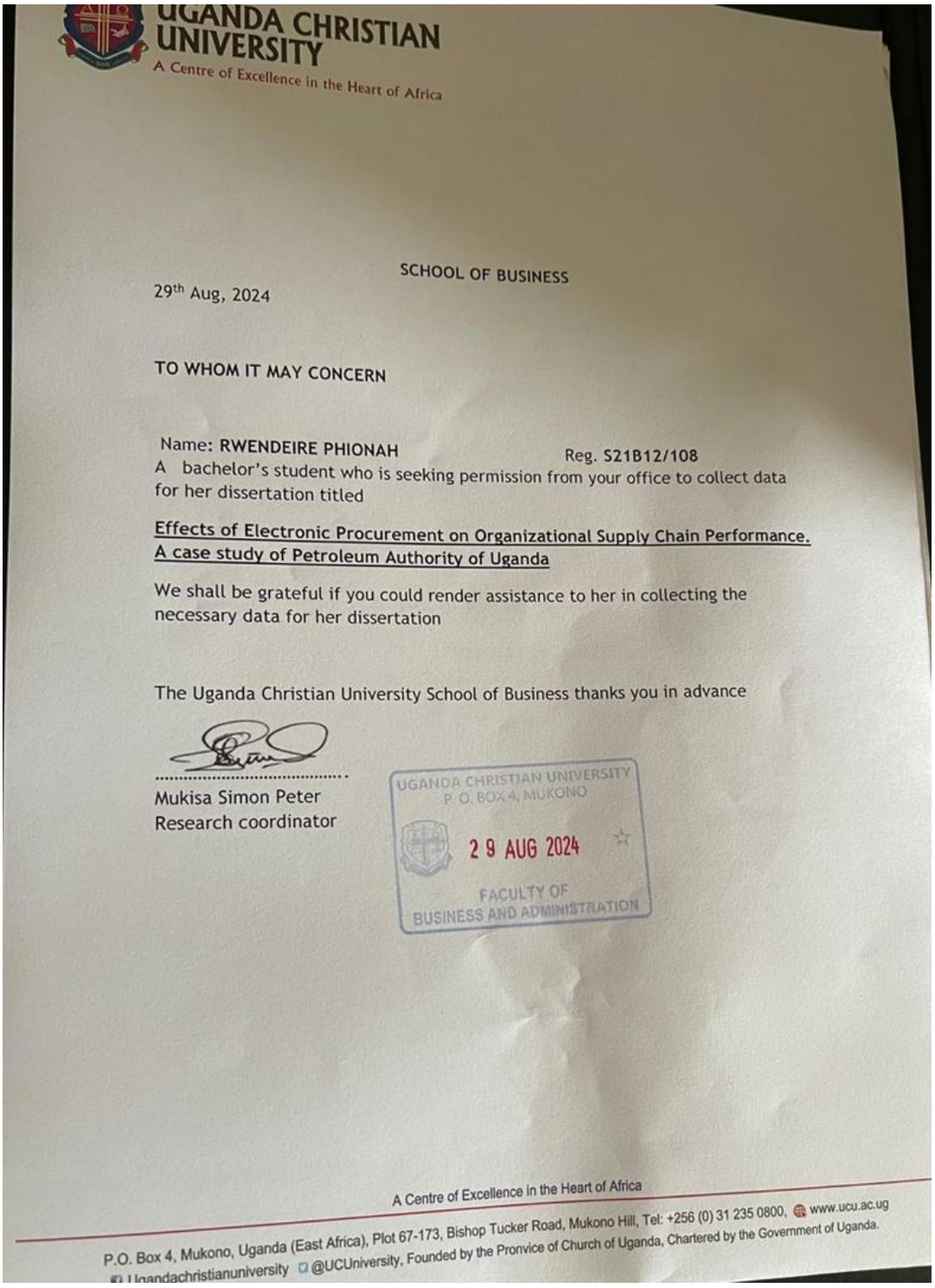
using a scale of 5=Strongly agree, 4=Agree, 3=Not sure, 2=Disagree and 1=strongly disagree.

A	**The role of Electronic tendering on supply chain performance**	**5**	**4**	**3**	**2**	**1**
1	Electronic tendering has improved the efficiency of our procurement processes.					
2	Our organization experiences faster procurement cycle times due to electronic tendering.					
3	The use of electronic tendering has reduced procurement costs for our organization.					
4	Electronic tendering has increased transparency in our procurement activities.					
5	Electronic tendering has facilitated better communication between suppliers and our organization.					
6	The implementation of electronic tendering has led to more competitive bidding among suppliers.					
B	**The effect of Electronic invoicing on supply chain performance**					
7	Electronic invoicing has reduced the time required to process invoices in our organization.					
8	Our organization has experienced fewer invoice-related errors due to electronic invoicing					
9	Electronic invoicing has improved our cash flow management.					
10	The use of electronic invoicing has streamlined our payment processes.					

11	Electronic invoicing has enhanced the accuracy of our financial records.					
12	Our organization has seen a reduction in disputes with suppliers due to electronic invoicing.					
C	**The effect of electronic payment on supply chain performance**					
13	Electronic payments have accelerated the speed of our transactions with suppliers.					
14	Our organization has experienced fewer payment delays since implementing electronic payments.					
15	Electronic payments have improved the accuracy of our financial transactions.					
16	The use of electronic payments has reduced the administrative burden associated with handling payments.					
17	Electronic payments have enhanced the security of our financial transactions.					
18	Our organization has benefited from better cash flow management due to electronic payments.					

Thank you

DATA COLLECTION LETTER



UGANDA CHRISTIAN UNIVERSITY
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SCHOOL OF BUSINESS

29th Aug, 2024

TO WHOM IT MAY CONCERN

Name: RWENDEIRE PHIONAH Reg. S21B12/108
A bachelor's student who is seeking permission from your office to collect data for her dissertation titled

Effects of Electronic Procurement on Organizational Supply Chain Performance. A case study of Petroleum Authority of Uganda

We shall be grateful if you could render assistance to her in collecting the necessary data for her dissertation

The Uganda Christian University School of Business thanks you in advance

.....
Mukisa Simon Peter
Research coordinator

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29 AUG 2024
FACULTY OF BUSINESS AND ADMINISTRATION

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