THE IMPACT OF E-PROCUREMENT ACTIVITIES ON SUPPLY CHAIN MANAGEMENT OF COMPANIES: A CASE OF MUKWANO GROUP OF COMPANIES

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A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF PROCUREMENT AND LOGISTICS MANAGEMENT OF UGANDA CHRISTIAN UNIVERSITY

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UGANDA CHRISTIAN UNIVERSITY

A Centre of Excellence in the Heart of Africa

DECLARATION

I, Ankunda Gloria, hereby declare that this research report entitled, "the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies," is my original work and that it has never been submitted in any institution for any award. I have read the regulations of the university with regard to plagiarism and here declare that I abided by all of them.

Signature: ..... Date: 07-08-2025

ANKUNDA GLORIA

S21B12/056

APPROVAL

This is to acknowledge that this research report entitled, "the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies," has been done under my supervision and is now ready for submission to the School of Business at Uganda Christian University.

Signature: ..... Date: 07-08-2025

MRS. Kabigho Macklue.

(Supervisor)

DEDICATION

With special regard, I wish to dedicate this piece of work to my parents who have always been there to support me in my education. May the Almighty God richly bless you.

ACKNOWLEDGEMENT

I would like to thank the Almighty God for the gift of life and guiding me throughout my education; it has not being easy but it was possible. My heartfelt gratitude goes to my supervisor, Mrs……..for the tireless efforts and expertise he rendered to me during his supervision.

Additionally, I acknowledge the managers and employees of Mukwano Group of Companies for providing me with the necessary information to complete my research.

Finally, special thanks go to my dear parents for their love, moral and financial support during the entire period of my education career.

God bless you all.

Table of Contents

LIST OF TABLES

ABSTRACT

The study examined the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies. It specifically focused on; establishing the effect of electronic tendering on supply chain management, assessing the effect of electronic order processing on supply chain management and examining the effect of electronic materials management on supply chain management in Mukwano Group of Companies.

The study was carried out using a cross sectional survey research design where both quantitative and qualitative research approaches were also used. The data was collected using questionnaires and interviews during the data collection, both purposive and stratified sampling methods were used. A sample size of 80 respondents who were top management and lower level employees of Mukwano Group of Companies was also used in the study.

The study findings revealed that electronic tendering, order processing, and material management have significantly enhanced supply chain management for Mukwano Group of Companies through increased efficiency, transparency, accuracy, and cost-effectiveness. Electronic tendering made procurement easier by automating it and real-time tracking, while electronic order processing improved order precision, reduced lead times, and facilitated inter-departmental coordination. Electronic material management improved stock control, demand planning, and eradicated wastage. Despite minor setbacks like system downtimes and training needs, all these technologies have collectively simplified procurement operations, improved supplier relations, and strengthened overall supply chain performance.

Finally, the study recommended the need for continuous system upgrades, comprehensive user training, enhanced technical support, and investment in automation and data analytics to improve procurement efficiency at Mukwano Group of Companies. It also advises strengthening supplier communication and integrating e-procurement systems into a unified platform to ensure better coordination, reliability, and overall supply chain responsiveness.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study was about examining the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies. The study's background, problem statement, purpose, aims, research questions, justification, significance, and conceptual framework are all presented in this chapter.

1.1 Background of the Study

In today's dynamic global competitive business environment, technology-based service is no longer an afterthought; rather it is a must for public and private organizations (Hallikas et al., 2021). It has become necessary for companies to provide their customers with cost-effective total solution and better customer satisfaction with innovative ideas and methods (Ramkumar et al., 2019). With the emergence of Information and Communication Technology (ICT), companies have been forced to shift their operation from the traditional style to e-Business, e-Procurement and e-Supply Chain philosophy in order to sustain themselves (Leeetal, 2017). Over the past decade, both private and public sector organizations have been utilizing Information Technology (IT) to streamline and automate their purchasing and other processes (Koorn et al., 2021).

E-procurement, the electronic management of procurement processes, has emerged as a critical component of modern supply chain management (SCM). Its adoption is driven by the pursuit of efficiency, cost reduction, and enhanced collaboration throughout the supply chain (Utama, 2020). In today's globalized and technologically advanced business environment, companies are increasingly turning to e-procurement solutions to streamline purchasing activities, optimize supplier relationships, and gain competitive advantage (Flechsig et al., 2022). E-procurement encompasses various online platforms, such as e-marketplaces, vendor portals, and electronic data interchange (EDI) systems. These platforms leverage digital technologies to automate tasks, improve transparency, and enable real-time communication among stakeholders. As a result, companies can achieve greater visibility into their supply chains, reduce procurement cycle times, and mitigate risks associated with manual processes (Nani & Ali, 2020).

Across the globe, the adoption of e-procurement varies significantly, with some regions leading the way in implementation and innovation (Siddiqui et al., 2022). In the United States, for instance, major corporations have heavily invested in sophisticated e-procurement systems to drive efficiency and cost savings (Kosmol et al., 2019). Companies like Amazon Business and SAP Ariba have revolutionized procurement practices by offering comprehensive solutions that integrate seamlessly with existing SCM frameworks. Similarly, European countries such as Germany, the United Kingdom, and France have embraced e-procurement as a strategic imperative for enhancing competitiveness in the global marketplace (Faccia & Petratos, 2021). In Asia, countries like China, Japan, and South Korea have witnessed rapid growth in e-procurement adoption, fueled by advancements in digital infrastructure and the proliferation of e-commerce platforms (Obunde, 2019).

In Africa, the adoption of e-procurement is gaining momentum, albeit at a slower pace compared to other regions. Countries such as South Africa, Kenya, and Nigeria are leading the way in implementing e-procurement initiatives aimed at modernizing procurement practices, enhancing transparency, and reducing corruption (Muriuki et al., 2019). However, challenges such as inadequate digital infrastructure, limited internet penetration, and regulatory barriers continue to hinder widespread adoption across the continent. Within sub-Saharan Africa, efforts to promote e-procurement vary from country to country (Matano et al., 2020). While some nations have made significant strides in digitizing procurement processes, others still rely on manual methods, posing challenges in terms of efficiency, transparency, and accountability. Countries like Ghana, Rwanda, and Ethiopia are investing in e-procurement platforms to improve governance, reduce procurement costs, and stimulate economic growth (Kaugu, 2019).

In Uganda, the Mukwano Group of Companies stands as a notable example of the transformative impact of e-procurement on supply chain management. As one of the largest conglomerates in the country, Mukwano Group has embraced e-procurement technologies to streamline its procurement processes, enhance supplier relationships, and drive operational efficiency (Owere, 2021). By leveraging e-procurement platforms, such as SAP Ariba, the company has achieved significant cost savings, reduced procurement cycle times, and improved inventory management. As more companies recognize the strategic value of digital transformation in procurement, the

adoption of e-procurement is expected to accelerate, driving sustainable growth, and competitiveness in the Ugandan market (Jules, 2022).

1.2 Problem statement

Ideally, e-procurement activities are expected to bolster supply chain management (Oppong, 2020). However, empirical evidence from various industries, including the Mukwano Group of Companies, indicates a downward trend when it comes to the management of the supply chains that these companies manage (Owere, 2021). For instance, over the past two years, lead times have increased by an average of 15%, while supplier visibility has decreased by 10%. Compliance issues have surged, with reported incidents rising by 20%, and supplier satisfaction levels have dropped by 12% (Bainomugisha et al., 2023). All this could be attributed to inadequate integration of e-procurement systems with SCM processes (Nanono, 2022). Failure to address these issues could exacerbate SCM performance, leading to higher operational costs, supply chain disruptions, loss of competitiveness, and diminished customer satisfaction (Kuteesa et al., 2021). Furthermore, while existing literature by scholars like Oppong (2020) and Muriuki et al. (2019) have explored the impact of e-procurement activities on SCM to some extent, there remains a significant gap in understanding the specific challenges faced by companies like Mukwano Group and the implications for their SCM performance. Therefore, this study sought to fill this gap by examining the impact of e-procurement activities on supply chain management of companies with a specific focus on Mukwano Group of Companies.

1.3 Purpose of the study

The purpose of the study was to examine the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies.

1.4 Objectives of the study

i. To establish the effect of electronic tendering on supply chain management in Mukwano Group of Companies.
ii. To assess the effect of electronic order processing on supply chain management in Mukwano Group of Companies.

iii. To examine the effect of electronic materials management on supply chain management in Mukwano Group of Companies.

1.5 Research questions

i. What is the effect of electronic tendering on supply chain management in Mukwano Group of Companies?
ii. What is the effect of electronic order processing on supply chain management in Mukwano Group of Companies?
iii. What is the effect of electronic materials management on supply chain management in Mukwano Group of Companies?

1.6 Scope of the study

The scope of the study covered three dimensions that is; content, geographical and time and these are discussed in detail below.

1.6.1 Content scope

This study specifically focused on; establishing the effect of electronic tendering on supply chain management, assessing the effect of electronic order processing on supply chain management and examining the effect of electronic materials management on supply chain management in Mukwano Group of Companies.

1.6.2 Geographical scope

Geographically, the study was conducted in Mukwano Group of Companies, located on Plot 30, P.O. Box 2671 Mukwano Road, Kampala. Mukwano Group of Companies was chosen because it's one of the manufacturing companies that has adopted the use of electronic procurement in the bid to improve the management of its overall supply chain.

1.6.3 Time scope

The study focused on scholarly material from the period 2019 to 2024. It was also carried out for a period of three month from February to April, 2025.

1.7 Justification of the study

The justification of this study lied in the pressing need for insights into the impact of e-procurement activities on supply chain management within the specific context of companies like Mukwano Group. By identifying and understanding the challenges faced and their implications on SCM dimensions such as process optimization, cost reduction, lead time, supplier visibility, compliance, and supplier relationship management, this research can provide valuable recommendations for enhancing operational efficiency, mitigating risks, and improving overall performance in the face of evolving market dynamics and technological advancements.

1.8 Significance of the study

The study will hold significance for various stakeholders, including the Mukwano Group of Companies, the broader beverage industry, policymakers, and future researchers/academicians.

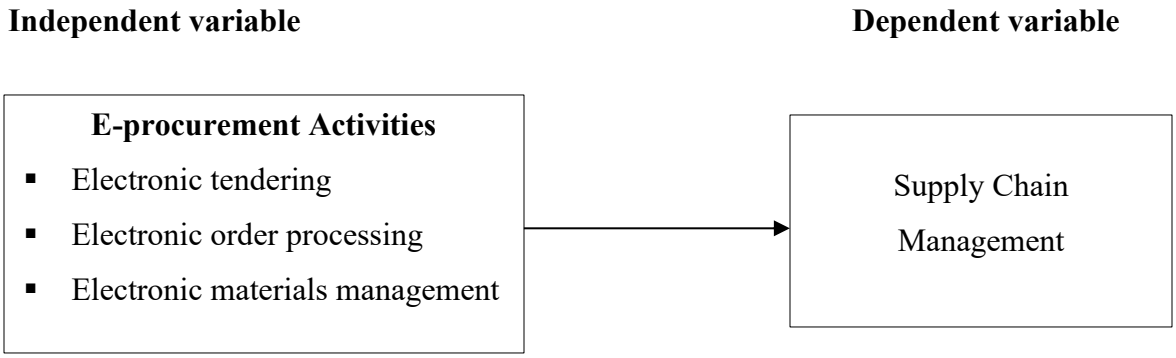
The study will be significant to companies like Mukwano Group by offering insights into optimizing e-procurement activities to enhance supply chain management, ultimately improving operational efficiency, reducing costs, and strengthening competitiveness in the market.

The study will also be valuable to policymakers and regulatory bodies by providing evidence-based recommendations for crafting policies that foster the integration of e-procurement practices to improve supply chain management standards and promote economic growth and sustainability.

Lastly, the study will be beneficial to researchers and academicians as it contributes to the existing body of knowledge by offering a comprehensive analysis of the impact of e-procurement activities on supply chain management within a specific context.

1.9 Conceptual framework

Conceptual framework on electronic procurement activities and supply chain management



Source: *Adopted from, Siddiqui et al. (2022) and modified by the researcher (2024)*

The conceptual framework for this study encompasses the impact of E-procurement activities on supply chain management in companies. E-procurement activities are segmented into electronic tendering, order processing, and materials management. The dependent variable, supply chain management, encapsulates various aspects crucial for operational efficiency and competitiveness.

1.10 Definitions of key terms

Electronic procurement: This refers to the use of digital technologies and platforms to manage and streamline procurement processes within organizations (Chan & Owusu, 2022).

Supply chain management: This is defined as the strategic coordination and integration of all activities involved in the sourcing, procurement, production, and distribution of goods and services to meet customer demands efficiently and effectively (Singh et al., 2019).

Electronic tendering: Electronic tendering refers to the use of digital platforms and tools to manage the procurement process of soliciting, submitting, and evaluating bids from suppliers. It involves online submission of tender documents, automated evaluation, and selection processes, aimed at improving transparency, reducing procurement lead times, and enhancing supplier competition (Hallikas et al., 2021).

Electronic order processing: Electronic order processing refers to the use of computerized systems to handle the placement, tracking, and management of purchase orders. This includes generating purchase orders electronically, automating approvals, and monitoring order fulfillment in real time, ensuring accuracy and efficiency in procurement operations (Chan & Owusu, 2022).

Electronic materials management: Electronic materials management refers to the application of digital tools and systems for tracking, storing, and managing materials throughout the supply chain. It includes real-time inventory tracking, automated replenishment, and data-driven decision-making to optimize material availability and reduce waste or stockouts (Mavidis & Folinas, 2022).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the scholarly materials put forward by several personalities on the impact of electronic procurement activities on supply chain management in organizations as well as critically analyzing the deviations in the explanations to find out the research gap in the study variables. Literature was reviewed objectively by starting with definition of a concept followed by reviewing of objectives. Sources like newspaper articles, magazines, encyclopedia and books related to the study were used.

2.1 Electronic tendering and supply chain management

Li et al. (2019) in their study investigated the effect of electronic tendering on supply chain management (SCM) in manufacturing companies. The research found that implementing electronic tendering systems led to significant improvements in SCM efficiency and effectiveness. By digitizing the tendering process, companies were able to streamline supplier selection and bidding processes, resulting in shorter lead times, reduced procurement costs, and improved supplier relationships. The study highlighted the importance of real-time communication and collaboration facilitated by electronic tendering platforms in enhancing supply chain visibility and decision-making. These findings suggest that electronic tendering plays a crucial role in enhancing SCM practices and driving competitive advantage in manufacturing companies.

A study by Chen et al. (2020) explored the impact of electronic tendering on SCM performance in the construction industry. The research revealed that adopting electronic tendering systems led to notable improvements in supply chain efficiency and project outcomes. By automating tendering processes and facilitating transparent communication between contractors and suppliers, companies were able to achieve better cost control, reduced project lead times, and improved project quality. The study also identified challenges related to data security and system compatibility, highlighting the importance of addressing technological and organizational barriers in realizing the full potential of electronic tendering in construction SCM. These findings

underscore the significant positive impact of electronic tendering on SCM practices and project performance in the construction sector.

Another study by Wang et al. (2021) focused on the effect of electronic tendering on SCM in the healthcare industry. The research found that implementing electronic tendering systems in healthcare organizations resulted in notable improvements in supply chain efficiency and patient care quality. By digitizing procurement processes, hospitals and healthcare providers were able to streamline purchasing activities, reduce costs, and enhance inventory management practices. The study also highlighted the role of electronic tendering in improving supplier visibility and compliance with regulatory requirements in the healthcare supply chain. These findings suggest that electronic tendering has the potential to drive significant improvements in SCM practices and patient outcomes in the healthcare sector.

Zhang et al. (2022) in their study investigated the impact of electronic tendering on SCM performance in the retail sector. The research found that companies that adopted electronic tendering systems experienced improvements in supply chain efficiency, cost savings, and customer satisfaction. By automating supplier selection and bidding processes, retailers were able to optimize inventory levels, reduce stockouts, and improve product availability. The study also highlighted the role of electronic tendering in facilitating collaboration with suppliers and enhancing product assortment planning and management. These findings suggest that electronic tendering plays a crucial role in driving SCM performance and competitive advantage in the retail industry.

Another study by Liu et al. (2023) examined the effect of electronic tendering on SCM practices in the food and beverage manufacturing sector. The research found that companies that implemented electronic tendering systems experienced improvements in supply chain efficiency, cost reduction, and supplier relationship management. By digitizing procurement processes, food and beverage manufacturers were able to optimize sourcing decisions, reduce procurement cycle times, and improve inventory management practices. The study also highlighted the role of electronic tendering in enhancing collaboration with suppliers and ensuring product quality and safety compliance. These findings suggest that electronic tendering can significantly improve SCM practices and performance in the food and beverage manufacturing industry.

2.2 Electronic order processing and supply chain management

Gupta et al. (2019) delved into the effect of electronic order processing on supply chain management (SCM) in the manufacturing sector. The research revealed that implementing electronic order processing systems resulted in significant improvements in SCM efficiency and performance. By digitizing order processing activities, companies were able to streamline order fulfillment processes, reduce order cycle times, and enhance inventory management practices. The study also highlighted the role of electronic order processing in improving communication and collaboration with suppliers, leading to better supply chain visibility and responsiveness to customer demand. These findings suggest that electronic order processing plays a crucial role in enhancing SCM practices and driving competitive advantage in manufacturing companies.

A study by Li et al. (2020) explored the impact of electronic order processing on SCM performance in the retail industry. The research found that companies that adopted electronic order processing systems experienced improvements in supply chain efficiency, cost reduction, and customer satisfaction. By automating order processing activities, retailers were able to optimize inventory levels, reduce stockouts, and improve order accuracy. The study also identified challenges related to system integration and data security, highlighting the importance of addressing technological and organizational barriers in realizing the full potential of electronic order processing in retail SCM. These findings underscore the significant positive impact of electronic order processing on SCM practices and customer service in the retail sector.

Another study by Wang et al. (2021) focused on the effect of electronic order processing on SCM in the healthcare industry. The research revealed that implementing electronic order processing systems in healthcare organizations led to notable improvements in supply chain efficiency and patient care quality. By digitizing order processing activities, hospitals and healthcare providers were able to streamline procurement processes, reduce costs, and enhance inventory management practices. The study also highlighted the role of electronic order processing in improving communication and collaboration with suppliers, leading to better product availability and patient outcomes. These findings suggest that electronic order processing has the potential to drive significant improvements in SCM practices and patient care in the healthcare sector.

Chen et al. (2022) in their study investigated the impact of electronic order processing on SCM performance in the food and beverage manufacturing sector. The research found that companies that implemented electronic order processing systems experienced improvements in supply chain efficiency, cost reduction, and supplier relationship management. By digitizing order processing activities, food and beverage manufacturers were able to optimize order fulfillment processes, reduce lead times, and improve inventory management practices. The study also highlighted the role of electronic order processing in enhancing collaboration with suppliers and ensuring product quality and safety compliance. These findings suggest that electronic order processing can significantly improve SCM practices and performance in the food and beverage manufacturing industry.

Another study by Kim et al. (2023) examined the effect of electronic order processing on SCM practices in the e-commerce sector. The research found that companies that adopted electronic order processing systems experienced improvements in supply chain efficiency, order accuracy, and customer satisfaction. By automating order processing activities, e-commerce retailers were able to optimize order fulfillment processes, reduce shipping times, and improve order tracking and visibility. The study also highlighted the role of electronic order processing in enhancing communication and collaboration with logistics partners, leading to better delivery performance and customer service. These findings suggest that electronic order processing plays a critical role in driving SCM performance and competitiveness in the e-commerce industry.

2.3 Electronic materials management and supply chain management

Zhang et al. (2019) investigated the effect of electronic materials management on supply chain management (SCM) in manufacturing companies. The research found that implementing electronic materials management systems led to significant improvements in SCM efficiency and effectiveness. By digitizing materials management processes, companies were able to optimize inventory control, improve demand forecasting accuracy, and enhance supplier relationship management. The study highlighted the importance of real-time data visibility and collaboration facilitated by electronic materials management platforms in driving supply chain optimization and cost reduction. These findings suggest that electronic materials management plays a crucial

role in enhancing SCM practices and driving competitive advantage in manufacturing companies.

A study by Wang and Chen (2020) explored the impact of electronic materials management on SCM performance in the retail industry. The research revealed that companies that adopted electronic materials management systems experienced improvements in supply chain efficiency, inventory turnover, and customer satisfaction. By automating materials management activities, retailers were able to optimize inventory levels, reduce stockouts, and improve product availability. The study also identified challenges related to data integration and system interoperability, highlighting the importance of addressing technological and organizational barriers in realizing the full potential of electronic materials management in retail SCM. These findings underscore the significant positive impact of electronic materials management on SCM practices and customer service in the retail sector.

Another study by Liu et al. (2021) focused on the effect of electronic materials management on SCM in the healthcare industry. The research found that implementing electronic materials management systems in healthcare organizations led to notable improvements in supply chain efficiency and patient care quality. By digitizing materials management processes, hospitals and healthcare providers were able to streamline procurement processes, reduce costs, and improve inventory management practices. The study also highlighted the role of electronic materials management in enhancing communication and collaboration with suppliers, leading to better product availability and patient outcomes. These findings suggest that electronic materials management has the potential to drive significant improvements in SCM practices and patient care in the healthcare sector.

Chen and Wu (2022) in their study investigated the impact of electronic materials management on SCM performance in the food and beverage manufacturing sector. The research found that companies that implemented electronic materials management systems experienced improvements in supply chain efficiency, cost reduction, and product quality management. By digitizing materials management activities, food and beverage manufacturers were able to optimize inventory control, reduce lead times, and improve traceability and compliance with regulatory requirements. The study also highlighted the role of electronic materials management

in enhancing collaboration with suppliers and ensuring product quality and safety throughout the supply chain. These findings suggest that electronic materials management can significantly improve SCM practices and performance in the food and beverage manufacturing industry.

Another study by Park et al. (2023) examined the effect of electronic materials management on SCM practices in the logistics and transportation sector. The research found that companies that adopted electronic materials management systems experienced improvements in supply chain efficiency, cost reduction, and service quality. By automating materials management activities, logistics companies were able to optimize inventory levels, reduce storage costs, and improve shipment tracking and visibility. The study also highlighted the role of electronic materials management in enhancing communication and collaboration with suppliers and customers, leading to better service performance and customer satisfaction. These findings suggest that electronic materials management plays a critical role in driving SCM performance and competitiveness in the logistics and transportation industry.

2.4 Summary and literature gap

The literature review synthesizes research on how electronic procurement activities influence supply chain management (SCM) in various industries. It defines key concepts like electronic procurement and SCM while examining their impact across sectors such as manufacturing, healthcare, and retail. Studies consistently demonstrate the benefits of electronic procurement, including efficiency gains and cost reductions. However, a research gap exists in understanding the specific contextual factors shaping these relationships, warranting further investigation into the nuanced dynamics of electronic procurement's impact on SCM in diverse organizational settings.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the methodology that was used in conducting the research. It described how this study was conducted. It includes the study design, study population and the sample size. It also describes the sampling procedure definition of variables, research instruments, data analysis and management, ethical considerations, and limitations of the study.

3.1 Research Design

This study employed the use of a cross-sectional survey research design. The design was selected since it requires less time to complete (Spector, 2019). It was also utilized since it enabled the researcher to record data pertaining to information obtained at a certain moment in time (Patrik & Ugo, 2019).

The study also made use of mixed-method research, which combines quantitative and qualitative research techniques. The quantitative study was conducted using questionnaire guide with the selected employees from different departments in Mukwano Group of Companies. Qualitative study was conducted using interview guide with the top management of Mukwano Group of Companies like the procurement manager and his assistant, logistics manager, finance manager and the IT manager who participated in the study as key informants in order to obtain a thorough analysis of the subject, and these were likewise regarded as key informants because they possessed pertinent expertise regarding the subject being studied. The quantitative approach was used with the aim of examining the impact of e-procurement activities on supply chain management of companies (Bloomfield & Fisher, 2019).

3.2 Area of the study

This study was conducted in Mukwano Group of Companies, located on Plot 30, P.O. Box 2671 Mukwano Road, Kampala. Mukwano Group of Companies was chosen because it's one of the manufacturing companies that has adopted the use of electronic procurement in the bid to improve the management of its overall supply chain.

3.3 Study population

Trochim (2006) defines population as the group in which a researcher wants to pick a sample from in order to make generalizations. The study population included all employees and senior staff members of Mukwano Group of Companies. According to the HRM of Mukwano Group of Companies records (2024), there are 100 workers at the headquarters and this number was the source of the sample size that helped the researcher to get the required data.

3.4 Sampling procedure and sample size

Table 1: Target Population, Size and Selection

Category of Respondents	**Population Size**	**Sample size**	**Sampling Techniques**
Lower level employees of Mukwano	96	76	Stratified sampling
Procurement manager	1	1	Purposive sampling
Logistics manager	1	1	Purposive sampling
Finance manager	1	1	Purposive sampling
IT manager	1	1	Purposive sampling
Total	**100**	**80**	

Source: *Mukwano Group of Companies (2024)*

Therefore from the table above, the sample size was 80 respondents got from a total population of 100 employees working in different departments in Mukwano Group of Companies and the top management of Mukwano Group of Companies specifically the procurement manager and his assistant, logistics manager, finance manager and the IT manager. The sample size was gotten using on the Krejcie and Morgan (1970) table as shown below;

Table 2: Table for determining sample size of a known population

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Source: *Krejcie & Morgan (1970)*

3.5 Sampling techniques and methods

The study was conducted using both stratified and purposive sampling methods. The lower level employees from the different departments in Mukwano Group of Companies were selected using the stratified sampling method. Stratified sampling involved dividing the population into distinct subgroups, or strata, that share similar characteristics, and then selecting a proportional sample from each stratum. This method ensures that each subgroup is adequately represented in the sample, enhancing the accuracy and generalizability of the study's findings. In this study, the employees from the different departments in Mukwano Group of Companies were divided into strata based on their respective departmental sizes. From these strata, a proportional number of employees were randomly selected. Stratified sampling was used to ensure that the sample accurately reflects the diversity within each organization's departments, providing a comprehensive understanding of the impact of e-procurement activities on supply chain management of companies.

On the other hand, for the procurement manager and his assistant, logistics manager, finance manager and the IT manager, purposive sampling was employed. Purposive sampling is a non-probability sampling method where participants were selected based on specific characteristics or criteria that are crucial to the research. In this study, the procurement manager and his assistant, logistics manager, finance manager and the IT manager were chosen because they hold specialized knowledge and expertise when it comes to e-procurement activities and supply chain management. These top management officials were selected purposively to provide in-depth insights and detailed information relevant to the research objectives. This method was used to ensure that the data collected is rich, relevant, and directly applicable to the study's focus on the relationship between e-procurement activities and supply chain management of companies since they are the ones involved in ensuring the effectiveness and efficiency of e-procurement activities in the bid to manage their supply chain better.

3.6 Sources of data

Primary source: Primary data are important for all areas of research because they are accurate information about the results of an experiment or observation. Primary data from the field was obtained through personal interviews and self-administered questionnaires to selected respondents in order to get their opinions. Primary data helped the researcher in collecting information for the specific purposes of their study. The researcher collected the data himself, using questionnaires and interview guides.

Secondary source: Secondary data refers to handling, collecting and possibly processing data by people other than the researcher in question. This source was used to collect data from already written literature for example e-books, journals, published articles and periodicals. Documentary resources are classified in order to facilitate the data collection and textual analysis (Mubazi 2008).

3.7 Data collection methods

3.7.1 Questionnaire Survey

According to Amin (2005) a survey is a self-report investigation used for gathering information about variables of interest. A questionnaire survey was employed in this study to collect

quantitative data on automation and warehouse operations optimization in CBC with the selected employees of Mukwano Group of Companies. The questionnaire consisted of structured items designed to elicit responses regarding the study objectives. This survey method was used because it allows for the efficient collection of large-scale data, enabling the researchers to quantify trends, correlations, and patterns related to e-procurement activities and supply chain management of companies (Mchumu, 2011).

3.7.2 Interviews

According to Desncombe (2008), interviews are open questions often administered to key informants to give them wide latitude to talk about the subject. The interviews complimented and triangulate the information gathered from respondents and the available documents (Patton 2001). This was intended to elicit a wide view on the subject. Interviews were both face-to-face and telephone interviews. These contained both structured and semi structured questions. Interviews were used because they have the advantage of ensuring probing for more information, clarification and capturing facial expression of the interviewees (Somekh and Lewin, 2015). In addition, they also give an opportunity to the researcher to revisit some of the issues that have been an over-sight in other instruments and yet they are considered vital for the study.

3.8 Data collection instruments

The study used a structured questionnaire and interview guides to collect information.

3.8.1 Questionnaires

The questionnaires comprised close-ended items accompanied by a list of possible alternatives from which respondents were requested to select the answers that best describe their opinion about the problem of investigation and situation (Mugenda and Mugenda, 2005). The questionnaire was standardized and rigid allowing no flexibility and answers were to items set in the questionnaire. This facilitates to enlist validity and control of the extraneous variables (Sarantakos, 2005). A structured questionnaire containing sections as per study variables were designed to collect information on the subject. It was administered to the respondents. It had a five point Likert scale with response choices such as, (5) strongly Agree, (4) Agree, (3) Not

sure, (2) Disagree, (1) Strongly Disagree. The Likert format was preferred because it gives the respondents a variety of responses for choice and the format also makes it easy to tabulate the data obtained for comparison purposes. The questionnaire was used to collect data from the selected 80 employees in different departments of Mukwano Group of Companies with their consent.

3.8.2 Interview guide

The interview topical guide was designed to collect information. This guide helped to maintain consistency. The interviews were preferred for top management who are an informed category by virtue of their offices, wide latitude to talk about the subject at length without limit. The interview guide contained unstructured items on each and every variable in the conceptual framework. According to Ragin (2009), interview guide has items that are used to guide the interviewing process henceforth the process has the advantage of ensuring probing for more information, clarification and capturing facial expression of the interviewees. The researcher conducted interviews with the 5 key informants who were the procurement manager and his assistant, logistics manager, finance manager and the IT manager.

3.9 Data collection procedure

The researcher obtained a recommendation and an introductory letter from Uganda Christian University, after which she sought permission from the different respondents in Mukwano Group of Companies to use as a case study. The researcher approached various respondents to conduct the interviews and distribute the questionnaire guides.

3.10 Validity and reliability of the research instruments

3.10.1 Validity

According to Cohen, Manion and Keith (2007), Validity is ensured by; choosing an appropriate scale, ensuring that there are adequate resources for the required research to be undertaken, selecting an appropriate methodology for ensuring the research questions, avoiding having too long or too short an interval between pre-test and post-test, ensuring standardized procedures for

gathering data or for information administering tests, and tailoring the instruments to the concentration span of the respondents.

Validity was done in order to find out whether the questions are capable of capturing the intended data. Experts in research reviewed the questions to see whether they were capable of capturing the intended response. A Content Validity Index (CVI) was calculated in order to establish the validity of the research instrument. The researcher used the following formula to establish validity of the research instruments as seen below.

$$\text{Content validity Index (CVI)} = \frac{\text{Relevant items by all judges as suitable}}{\text{Total number of items judged.}}$$

The CVI was 0.81 which was greater than the recommended 0.70 (Kent, 2001), implying that the questionnaire was valid for data collection.

3.10.2 Reliability

Mugenda and Mugenda (2003) defined reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability of the questionnaire instrument was assessed using Cronbach's coefficient alpha. A pilot study was carried out on 5 respondents and the reliability results were computed using the Statistical Package for the Social Sciences (SPSS). The coefficient was 0.83 which was above the recommended .70 (Amin, 2005), implying that the questionnaire was suitable for data collection.

3.11 Data Analysis

3.11.1 Analysis of quantitative data

Data analysis was done with the aid of the package (SPSS) version 26 which besides being user friendly, is appropriate for handling the correlations between the variables plus regressions in the study. SPSS specifically helped the researcher to analyse quantitative data from the questionnaires. All variables were assigned with names and coded for computer entry. Secondly all the responses were coded to facilitate computer data in-put. Thirdly, after data entry is completed, negatively worded scales were recorded and assigned with new values. Fourthly, in

order to get composite scores for items on a scale, target variables were computed. Fifthly, data was screened in order to minimize data entry errors. Quantitative data was analyzed using descriptive, bivariate and multivariate statistics to determine the level of association of the independent variables and the dependent variable.

3.11.2 Analysis of qualitative data

This involved the use of thematic review. Thus, qualitative data was edited and reorganized into meaningful phrases. In other words, a thematic approach was used to analyze qualitative data where themes, categories and patterns were identified. The recurrent themes, which emerged in relation to each guiding question from the interviews, were presented in the results, with selected direct quotations from participants presented as illustrations.

3.12 Ethical Considerations

The researcher obtained a recommendation and an introductory letter from the School of Business in Uganda Christian University, after which she sought permission from the different respondents in Mukwano Group of Companies to use as a case study. The researcher approached various respondents to conduct KIIs and distribute the questionnaires.

More so, the researcher exhibited a high level of ethical behaviour in the course of implementing the study; confidentiality where the information got from the field was only used for academic purposes. There was also anonymity of the respondents exhibited so that they got the freedom to express themselves. Informed consent was obtained from all respondents before including them in the study.

In addition, all data gathered was used only for the purpose of this study and nothing else. The research procedures were explained to all the respondents before they took part in the research and their informed consent obtained. All the sources of literature were acknowledged throughout the whole study through proper citations and referencing. Finally, personal bias was avoided during the entire study that is to say during interviews, data analysis and reporting.

3.13 Limitations and delimitations of the study

Some respondents were not willing to provide information because of being suspicious of where the information would be taken. This was solved through the remarkable reputation in the study context as a learning institution and also obtaining an introductory letter from the university.

The researcher was also limited by funds that were needed to facilitate the research such as motivating the respondents, printing fees and even daily transport to the university to collect data. However, the researcher used self-initiatives and strategies to mobilize financial assistance from family and friends who wished her well.

CHAPTER FOUR

DATA PRESENTATION AND INTERPRETATION

4.0 Introduction

This chapter presents and discusses the results of analysis that has been done to look at the specific objectives of the study and in relation to the reviewed literature. The study was cried out using interviews and questionnaires with top management and lower level employees of Mukwano Group of Companies. The findings are presented with the help of tables for purposes of clarity and interpretation.

4.1 Response rate

A total of 80 respondents were meant to be involved in the study using questionnaires and all of them were successfully involved in the study as shown in Table 1 below in relation to the different categories.

Table 3: Response rate

Response Rate	**Frequency**	**Percentage**
Response	80	100%
Non Response	00	00%
Total	**80**	**100%**

Source: *Primary data*

According to table 3 above a total of 80 (100%) respondents who are; top management and lower level employees working in the different departments in Mukwano Group of Companies were expected to be involved in the study and all the respondents gave their response giving a response rate of 100%. The reason for the high response rate was due to the fact that the researcher had enough time to collect the data herself and given that the number of respondents required was relatively small. According to Ahuja (2009), a response rate of 70% is excellent, 60% is good and 50% is adequate for analysis. Thus the response rate of 100% was considered reliable and appropriate for the study.

4.2 Findings on demographic characteristics of respondents

This section presents the general background information about the respondents in relation to their gender, age, highest level of education, department and period spent working with Mukwano Group of Companies as shown in the table below;

Table 4: Background Information about the respondents

Item	Description	Frequency	Percentage (%)
Gender	Male	47	58.7
	Female	33	41.3
	Total	**80**	**100.0**
Age bracket	21-30 years	38	47.5
	31-40 years	30	37.5
	41-50 years	12	15.0
	Total	**80**	**100.0**
Level of education	Diploma	16	20.0
	Bachelor's degree	34	42.5
	Master's degree	5	6.2
	Others	25	31.3
	Total	**80**	**100.0**
Departments	Administration	10	12.5
	Accounts & Finance	8	10.0
	Production	28	35.0
	Procurement & Logistics	15	18.8
	Sales & Marketing	19	23.7
	Total	**80**	**100.0**
Period spent working	1-5 years	32	40.0
	6-10 years	37	46.3
	Above 10 years	11	13.7
	Total	**80**	**100.0**

Source: *Primary data*

Table 4 above shows that majority of the questionnaires were filled by males represented by 58.7% and the rest were females represented by 41.3% and therefore, there were more male respondents than female respondents in this survey. However, the inclusion of both male and female in the survey was to get a balance view of responses from different people in the company concerning the topic under study.

The table above shows that 47.5% of the respondents are between 21-30 years, followed by those with 31-40 years represented by 37.5%, whereas those who are between 41-50 years were represented by 15%. This therefore implies that there was no age discrimination since information was gotten from people with different age groups.

Furthermore, the table above indicates that majority of respondents represented by 35% are from the productions department, followed by those who are from the sales and marketing department represented by 23.7%, followed by those who are from the procurement and logistics department represented by 18.8%, followed by those from the administration department represented by 12.5%, whereas those from the accounts and finance department constituted 10% of the total population. This implies that all employees from different departments and at different levels were involved in the study and this helped to gather information and different views of people about the topic in particular.

Finally, the table above also indicates that majority of respondents represented by 46.3% have spent between 6-10 years working in Mukwano Group of Companies, followed by those who have spent 1-5 years working in Mukwano Group of Companies represented by 40%, whereas those who have spent above 10 years working with Mukwano Group of Companies represented the minority 13.7% of the total population. The findings imply that the respondents have the necessary and efficient knowledge about the topic under study since majority of the respondents have spent reasonable time working with Mukwano Group of Companies.

4.3 Effect of electronic tendering on supply chain management in Mukwano

Table 5 summarizes respondents' responses on the effect of electronic tendering on supply chain management in Mukwano Group of Companies by using a Likert scale where SA (Strongly Agree), A (Agree), NS (Not Sure), D (Disagree) and SD (Strongly Disagree).

Table 5: Effect of electronic tendering on supply chain management in Mukwano

Statements	Extent of agreement and disagreement				
	SA	A	NS	D	SD
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Electronic tendering has reduced the time taken to complete procurement processes in our department	42 52.5%	24 30.0%	00	10 12.5%	4 5.0%
The electronic tendering system enhances transparency in supplier selection	23 28.8%	35 43.7%	6 7.5%	11 13.7%	5 6.3%
Electronic tendering has minimized errors in the tendering process	19 23.7%	38 47.5%	7 8.8%	15 18.7%	1 1.3%
The electronic tendering system facilitates better communication with potential suppliers	21 26.3%	34 42.5%	5 6.3%	20 25.0%	00
The use of electronic tendering has increased cost savings in our procurement activities	23 28.8%	35 43.7%	10 12.5%	12 15.0%	00
Electronic tendering enables effective tracking of tender progress in real-time	24 30.0%	40 50.0%	00	16 20.0%	00

Source: *Primary data*

Table 5 represents the descriptive statistics on the effect of electronic tendering on supply chain management in Mukwano Group of Companies. According to the study in table 3 above, 82.5% of the respondents agreed that electronic tendering significantly reduces the time required to complete procurement processes, whereas 17.5% of the respondents disagreed with the statement put across. This indicates that electronic tendering is widely viewed as an effective tool for enhancing time efficiency in procurement, implying that its continued application could further streamline operations and reduce delays in the procurement cycle.

The findings also revealed that 72.5% of the respondents agreed that electronic tendering enhances transparency in supplier selection, whereas 20.0% of the respondents disagreed, and 7.5% were not sure about the statement put forward. This suggests that electronic tendering is considered a significant contributor to fostering fairness and openness in procurement, implying that its adoption can strengthen trust and integrity in the supplier selection process.

Furthermore, the findings showed that 71.2% of the respondents agreed that electronic tendering minimizes errors in the tendering process, whereas 20.0% of the respondents disagreed, and 8.8% were not sure about the statement put across. This highlights the ability of electronic tendering to enhance accuracy and reduce mistakes, implying that it is a valuable tool for ensuring reliability and precision in procurement activities.

More so, the findings established that 68.8% of the respondents agreed that electronic tendering facilitates better communication with potential suppliers, while 25.0% of the respondents disagreed, and 6.3% were not sure about the statement put forward. This underscores the role of electronic tendering in improving communication channels and collaboration, implying that its use can lead to better coordination and stronger supplier relationships.

In addition, the findings indicated that 72.5% of the respondents agreed that electronic tendering has increased cost savings, whereas 15.0% of the respondents disagreed, and 12.5% were not sure about the statement put across. This demonstrates the cost-effectiveness of electronic tendering, implying that its adoption can help organizations optimize their financial resources and reduce unnecessary expenses in procurement.

Lastly, the findings revealed that majority of the respondents represented by 80.0% agreed that electronic tendering allows for effective real-time tracking of tender progress, whereas 20.0% of the respondents disagreed with the statement put forward. This highlights the capability of electronic tendering systems to provide real-time updates and improve accountability, implying that their use can enhance transparency and efficiency in managing procurement processes.

Overall, the findings indicate that electronic tendering is highly effective in enhancing supply chain management at Mukwano Group of Companies, as evidenced by the majority of

respondents agreeing across all statements. This shows that electronic tendering significantly contributes to efficiency, accuracy, and cost-effectiveness in supply chain processes.

4.3.1 Effect of electronic tendering on supply chain management

From the interviews conducted with the key informants who were top management of Mukwano Group of Companies specifically the procurement manager and his assistant, logistics manager, finance manager and the IT manager, they were asked for their views on how the adoption of electronic tendering has impacted the efficiency of supplier selection and procurement processes in the company and their responses were as follows;

The key informants revealed that the adoption of electronic tendering has significantly improved the efficiency of supplier selection and procurement processes. They noted that the system has enhanced transparency by providing a structured and standardized approach to evaluating suppliers, reducing instances of bias and favoritism. Electronic tendering has also expedited the procurement cycle by automating various stages, such as bid submission, evaluation, and contract awarding. As a result, the company has been able to reduce procurement lead times, minimize paperwork, and enhance overall accountability in supplier selection. Furthermore, the system has enabled better communication and collaboration between the company and its suppliers, ensuring a seamless exchange of information and reducing delays caused by manual tendering procedures.

Additionally, the respondents emphasized that electronic tendering has improved cost efficiency by allowing for better price comparisons and competitive bidding, ultimately leading to cost savings. The digital platform ensures that procurement decisions are based on real-time data and comprehensive supplier performance assessments, reducing risks associated with poor supplier selection. Moreover, the integration of electronic tendering with other supply chain management systems has enhanced data accuracy and security, reducing errors and fraudulent activities. However, the key informants also acknowledged that while the system offers numerous benefits, it requires continuous upgrades and capacity-building initiatives to ensure that all stakeholders, including suppliers, can effectively utilize it. Despite these challenges, the overall sentiment was that electronic tendering has transformed procurement processes by making them more efficient, reliable, and cost-effective. Some of the selected respondents reported that,

"*.....Electronic tendering has brought a new level of efficiency and transparency to our procurement processes. We now have a structured way of selecting suppliers based on clear criteria, eliminating bias and ensuring fairness.....*" **Key Informant 1**

"*.....The automation of the tendering process has significantly reduced lead times and minimized paperwork, making procurement operations faster and more reliable.....*" **Key Informant 2**

4.4 Effect of electronic order processing on supply chain management in Mukwano

Table 6 summarizes respondents' responses on the effect of electronic order processing on supply chain management in Mukwano Group of Companies by using a Likert scale where SA (Strongly Agree), A (Agree), NS (Not Sure), D (Disagree) and SD (Strongly Disagree).

Table 6: Effect of electronic order processing on supply chain management in Mukwano

Statements	Extent of agreement and disagreement				
	SA	A	NS	D	SD
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Electronic order processing has improved the accuracy of order fulfillment in our department	20 25.0%	58 72.5%	00	2 2.5%	00
The system allows for faster approval and processing of orders	14 17.5%	63 78.8%	00	3 3.8%	00
Electronic order processing reduces delays in order delivery	22 27.5%	50 62.5%	2 2.5%	6 7.5%	00
The platform provides real-time updates on order status	19 23.8%	57 71.3%	00	4 5.0%	00
Electronic order processing has decreased paperwork and manual errors in our department	20 25.0%	49 61.2%	00	11 13.8%	00
The system enhances coordination between departments involved in order management	19 23.7%	56 70.0%	00	5 6.3%	00

Source: *Primary data*

Table 6 represents the descriptive statistics on the effect of electronic order processing on supply chain management in Mukwano Group of Companies. According to the study in table 4 above, 97.5% of the respondents agreed that electronic order processing has improved the accuracy of order fulfillment, while only 2.5% disagreed with this statement put across. This indicates that electronic order processing is highly effective in enhancing the precision of order fulfillment, implying that its implementation reduces the likelihood of errors and enhances customer satisfaction.

The findings also revealed that 96.3% of the respondents agreed that the system allows for faster approval and processing of orders, whereas 3.8% of the respondents disagreed with the statement put forward. This demonstrates that electronic order processing plays a crucial role in expediting order approvals, implying that it contributes to reduced lead times and improved operational efficiency in the supply chain.

Furthermore, the findings established that 90.0% of the respondents agreed that electronic order processing reduces delays in order delivery, whereas 7.5% of the respondents disagreed, and 2.5% were not sure about the statement put across. This highlights that electronic order processing is instrumental in ensuring timely delivery, implying that it minimizes bottlenecks in the supply chain and improves service delivery.

More so, the findings indicated that 95.1% of the respondents agreed that the platform provides real-time updates on order status, whereas 5.0% disagreed with the statement put forward. This underscores the role of electronic order processing in enhancing real-time visibility, implying that it fosters accountability and improves decision-making through instant status updates.

In addition, the findings illustrated that 86.2% of the respondents agreed that electronic order processing has decreased paperwork and manual errors in their department, whereas 13.8% of the respondents disagreed with this statement put across. This demonstrates the efficiency of electronic systems in reducing manual workload and errors, implying that they can streamline operations and enhance productivity.

Lastly, the study established that 93.7% of the respondents agreed that the system enhances coordination between departments involved in order management, whereas 6.3% of the

respondents disagreed with the statement put forward. This suggests that electronic order processing facilitates better collaboration and alignment among departments, implying that its application strengthens the integration of supply chain processes.

Overall, the findings indicate that electronic order processing is highly effective in improving supply chain management at Mukwano Group of Companies. The system enhances accuracy, speeds up order approvals, reduces delays, provides real-time updates, minimizes paperwork, and improves departmental coordination. These results imply that the adoption of electronic order processing significantly contributes to operational efficiency, accuracy, and enhanced service delivery within the company.

4.4.1 Effect of electronic order processing on supply chain management

From the interviews conducted with the key informants who were top management of Mukwano Group of Companies specifically the procurement manager and his assistant, logistics manager, finance manager and the IT manager, they were asked for their views on how electronic order processing has influenced order accuracy and lead times in Mukwano Group of Companies and their responses were as follows;

The key informants emphasized that electronic order processing has greatly improved order accuracy and reduced lead times within the company. They noted that the automation of order processing has minimized human errors that were common in manual order handling, ensuring that purchase requests, approvals, and deliveries align seamlessly. The integration of electronic order processing with inventory management systems allows real-time tracking of stock levels, reducing the chances of errors such as duplicate orders or stock shortages. This has resulted in improved efficiency in procurement operations, as orders are processed with greater precision and minimal discrepancies.

Additionally, the respondents highlighted that electronic order processing has significantly reduced order fulfillment times. The automation of order placement, approval workflows, and supplier notifications has eliminated delays associated with manual processing, leading to faster procurement cycles. With the system in place, approvals are obtained electronically, reducing bottlenecks caused by paperwork and slow manual authorizations. Moreover, suppliers receive

immediate notifications upon order confirmation, allowing them to prepare and dispatch goods more efficiently. This has not only improved supplier relationships but also enhanced overall supply chain responsiveness, ensuring that production and distribution processes are not interrupted due to procurement delays.

The key informants further explained that electronic order processing has enhanced visibility and traceability of orders, providing real-time updates on order status, expected delivery times, and any potential delays. This level of transparency has allowed different departments to coordinate better and make informed decisions regarding inventory replenishment and production schedules. They also noted that the system has improved accountability, as every step in the order processing chain is documented electronically, reducing fraud and unauthorized purchases. While some challenges, such as system downtimes and the need for continuous training, were acknowledged, the respondents unanimously agreed that electronic order processing has transformed Mukwano's procurement operations by enhancing order accuracy, reducing lead times, and improving overall efficiency. Some of the selected respondents reported that,

> "*.....Electronic order processing has eliminated the inefficiencies of manual procurement, ensuring that orders are processed quickly and accurately, leading to a more reliable supply chain…..*" **Key Informant 3**

> "*.....With real-time tracking and automated approvals, we no longer experience unnecessary delays in order fulfillment, making our procurement and inventory management highly efficient…..*" **Key Informant 4**

4.5 Effect of electronic materials management on supply chain management in Mukwano

Table 7 summarizes respondents' responses on the effect of electronic materials management on supply chain management in Mukwano Group of Companies by using a Likert scale where SA (Strongly Agree), A (Agree), NS (Not Sure), D (Disagree) and SD (Strongly Disagree).

Table 7: Effect of electronic materials management on supply chain management

Statements	Extent of agreement and disagreement				
	SA	A	NS	D	SD
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
The electronic materials management system has improved inventory tracking in real time	23 28.8%	51 63.8%	4 5.0%	1 1.3%	1 1.3%
The system helps in accurately forecasting material requirements	19 23.8%	53 66.3%	7 8.8%	00	1 1.3%
Electronic materials management reduces wastage of materials	21 26.3%	54 67.5%	4 5.0%	1 1.3%	00
The system enables quick access to information on stock levels and locations	23 28.8%	51 63.8%	4 5.0%	2 2.6%	00
Electronic materials management has streamlined our restocking processes	20 25.0%	58 72.5%	00	2 2.5%	00
The electronic materials management system helps in minimizing stockouts and overstock situations	19 23.8%	57 71.3%	00	4 5.0%	00

Source: *Primary data*

Table 7 represents the descriptive statistics on the effect of electronic materials management on supply chain management in Mukwano Group of Companies. According to the study in table 5 above, 92.6% of the respondents agreed that the electronic materials management system has improved inventory tracking in real-time, whereas only 2.6% of respondents disagreed, and 5.0% were not sure about the statement put across. This indicates that electronic materials management is widely viewed as effective in enhancing real-time inventory tracking, implying that its

continued use can help reduce stock management errors and ensure accurate inventory monitoring.

The findings also revealed that 90.1% of the respondents agreed that the system helps in accurately forecasting material requirements, whereas 1.3% of the respondents disagreed, and 8.8% were not sure about the statement put forward. This suggests that electronic materials management plays a significant role in improving demand forecasting, implying that it can help optimize material planning and reduce the risk of overstocking or understocking.

Furthermore, the findings showed that 93.8% of respondents agreed that electronic materials management reduces wastage of materials, whereas 1.3% of the respondents disagreed, and 5.0% were not sure about the statement put across. This highlights the effectiveness of the system in minimizing material wastage, implying that its implementation can promote cost savings and environmental sustainability.

More so, the findings established that 92.6% of the respondents agreed that the system enables quick access to information on stock levels and locations, whereas 2.6% of the respondents disagreed, and 5.0% were not sure about the statement put forward. This underscores the role of electronic materials management in facilitating efficient access to stock information, implying that its use can improve decision-making and operational efficiency in supply chain processes.

In addition, the findings indicated that 97.5% of respondents agreed that electronic materials management has streamlined restocking processes, whereas 2.5% of respondents disagreed with the statement put across. This demonstrates that the system is highly effective in improving restocking operations, implying that its adoption can enhance the reliability of supply chain functions and reduce stockouts.

Lastly, the findings illustrated that 95.1% of the respondents agreed that the electronic materials management system helps in minimizing stockouts and overstock situations, whereas 5.0% of respondents disagreed with the statement put forward. This highlights the system's contribution to balancing inventory levels, implying that its use can help optimize supply chain performance and reduce unnecessary costs.

Overall, the findings indicate that electronic materials management is highly effective in enhancing supply chain management at Mukwano Group of Companies, as evidenced by the majority of respondents agreeing across all statements. This demonstrates that the system significantly contributes to efficiency, accuracy, and cost-effectiveness in supply chain operations.

4.5.1 Effect of electronic materials management on supply chain management

From the interviews conducted with the key informants who were top management of Mukwano Group of Companies specifically the procurement manager and his assistant, logistics manager, finance manager and the IT manager, they were asked for their views on how electronic materials management has contributed to inventory accuracy and control within the company and their responses were as follows;

The key informants noted that electronic materials management has significantly improved inventory accuracy and control within the company. They noted that the automation of inventory tracking has minimized errors that were common in manual record-keeping, ensuring that stock levels are updated in real-time. This has helped prevent discrepancies such as stock shortages or excess inventory, as the system provides precise data on material availability. The integration of barcode scanning and RFID technology has further enhanced accuracy by reducing the risks of data entry errors and unauthorized stock adjustments.

Additionally, the respondents emphasized that electronic materials management has improved control over inventory movements and usage. The system provides detailed tracking of materials from procurement to storage and usage, enabling better monitoring of stock inflows and outflows. With automated alerts and reporting features, the company can detect irregularities, such as unauthorized withdrawals or slow-moving inventory, allowing for timely corrective actions. Furthermore, electronic materials management has streamlined stock audits, reducing the time and effort required for physical stock verification. The respondents noted that this has strengthened accountability and transparency in inventory management, ensuring that resources are optimally utilized.

The key informants also pointed out that electronic materials management has enhanced demand forecasting and procurement planning. With access to accurate historical data and predictive analytics, the company can anticipate material needs more effectively, minimizing both stockouts and overstock situations. This has improved operational efficiency by ensuring that the right materials are available at the right time, reducing delays in production and order fulfillment. While some challenges, such as system downtimes and the need for continuous system updates, were acknowledged, the respondents agreed that the benefits of electronic materials management far outweigh the challenges, making it a vital tool for enhancing inventory accuracy and control. Some of the selected respondents reported that,

> "*.....Electronic materials management has transformed our inventory tracking, ensuring real-time accuracy and minimizing errors that were common in manual systems.....*" **Key Informant 5**

> "*.....With automated stock monitoring and alerts, we have better control over material usage, leading to improved efficiency and reduced wastage.....*" **Key Informant 6**

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes all findings reported in chapter four according to questions of the study, draws conclusions, suggests recommendations and also proposes some areas for further study.

5.1 Discussion of findings

5.1.1 Effect of electronic tendering on supply chain management in Mukwano Group of Companies

The study findings revealed that electronic tendering has significantly improved supply chain management at Mukwano by enhancing efficiency, transparency, and cost-effectiveness in procurement processes. The findings relate with the literature by Chan & Owusu (2022), who argue that the adoption of electronic procurement systems has led to streamlined procurement processes, reducing delays and inefficiencies associated with traditional paper-based methods. Similarly, Jules (2022) highlights that e-procurement adoption enhances supplier selection transparency by providing an open and competitive platform, which aligns with the study's findings that electronic tendering at Mukwano facilitates fair bidding and reduces procurement-related corruption. Furthermore, Bainomugisha et al. (2023) emphasize that digital procurement tools ensure adherence to statutory procurement guidelines, which is consistent with the study's indication that automation in procurement leads to better compliance and accountability.

The study findings revealed that electronic tendering reduces procurement lead times and minimizes errors, leading to increased operational efficiency. This is supported by the literature from Hallikas et al. (2021), who assert that digital procurement systems, through automation and real-time data analytics, enhance decision-making and improve supply chain performance. Additionally, Flechsig et al. (2022) found that robotic process automation in procurement eliminates redundant processes and reduces human errors, which corroborates the study’s observation that electronic tendering minimizes procurement errors at Mukwano Group. Matano et al. (2020) further emphasize that electronic procurement ensures real-time tracking of tenders,

thereby enhancing accountability and efficiency in procurement workflows, a finding that aligns with Mukwano Group's improved tracking mechanisms through digital tendering.

The study findings further revealed that electronic tendering at Mukwano Group improves communication with suppliers and enables real-time tracking of tender progress, ultimately increasing cost savings. This finding is consistent with the literature by Kosmol et al. (2019), who argue that e-procurement fosters seamless communication and collaboration between buyers and suppliers, leading to better procurement outcomes. Similarly, Oppong (2020) highlights that electronic procurement platforms facilitate supplier engagement and enable organizations to monitor procurement progress effectively. Faccia & Petratos (2021) also discuss how blockchain and ERP-integrated procurement systems enhance transparency and traceability in procurement transactions, reinforcing the study's observation that electronic tendering enhances visibility and control over the tendering process at Mukwano Group.

Finally, the study findings indicated that electronic tendering facilitates competitive bidding, enhances data accuracy, and reduces procurement risks, ultimately optimizing financial resources. These findings are in line with the work of Siddiqui et al. (2022), who found that digital procurement significantly mitigates procurement risks by improving data integrity and automating compliance checks. Similarly, Mavidis & Folinas (2022) assert that advanced e-procurement systems, including AI-driven analytics, support strategic sourcing and competitive supplier selection, which aligns with the study's revelation that electronic tendering at Mukwano Group promotes cost-effective procurement. Furthermore, Yevu et al. (2023) emphasize that overcoming barriers to e-procurement adoption, such as training and system upgrades, ensures sustainable benefits, which corresponds with the study's findings that continuous system enhancements are necessary for maximizing the efficiency of electronic tendering.

5.1.2 Effect of electronic order processing on supply chain management in Mukwano Group of Companies

The study findings revealed that electronic order processing has significantly improved supply chain management at Mukwano Group of Companies by enhancing order accuracy. This aligns with the broader trend of digitalization in supply chains, as noted by Wisner, Tan, and Leong (2021), who emphasize the role of technology in streamlining operations. The reduction in

manual errors through automation contributes to improved data integrity, a key aspect of effective supply chain management. Furthermore, the expedited approvals facilitated by the system resonate with the findings of Nandankar and Sachan (2020), who highlight the importance of efficient processes in e-procurement adoption for optimal performance. This improved accuracy and speed in order processing directly contributes to the overall efficiency of the supply chain.

The study also found that electronic order processing has reduced lead times and streamlined procurement operations at Mukwano. This is consistent with the observations of Hugos (2024) regarding the impact of technology on supply chain responsiveness. The improved coordination between departments, facilitated by the system, contributes to a smoother workflow and faster order fulfillment. This streamlining effect is further supported by the finding of improved visibility and traceability, which allows for better monitoring and control of the procurement process. This enhanced visibility, coupled with real-time updates on order status, strengthens accountability and reduces instances of fraud and unauthorized purchases, contributing to a more secure and efficient supply chain.

Moreover, the study revealed that electronic order processing has strengthened supplier relationships at Mukwano by ensuring timely order processing and delivery. This aligns with the concept of collaborative relationships in supply chain management, as discussed by Singh et al. (2019), where technology plays a crucial role in facilitating communication and information sharing. Timely order processing and delivery contribute to supplier satisfaction and trust, fostering stronger and more reliable partnerships. This improved communication and collaboration can lead to better negotiation terms, improved product quality, and potentially even joint problem-solving, all of which benefit the entire supply chain.

Finally, despite minor challenges like system downtimes and training needs, electronic order processing has proven instrumental in optimizing procurement efficiency and overall supply chain responsiveness at Mukwano. This finding emphasizes the importance of continuous improvement and investment in technology for sustained benefits. As observed by Utama (2020) in the context of e-government implementation, successful technology adoption requires ongoing support and adaptation. Addressing the challenges related to system downtimes and training

needs will further enhance the effectiveness of the electronic order processing system and maximize its positive impact on Mukwano's supply chain management. This reinforces the need for organizations to not only adopt new technologies but also to invest in the necessary infrastructure and training to ensure their successful implementation and long-term sustainability.

5.1.3 Effect of electronic materials management on supply chain management in Mukwano Group of Companies

The study findings revealed that electronic materials management has significantly enhanced supply chain management at Mukwano Group of Companies by improving inventory tracking. This improvement aligns with the broader focus on visibility and control within modern supply chains, as highlighted by Queiroz et al. (2020) in their discussion of blockchain and supply chain integration. Effective inventory tracking is crucial for minimizing stockouts and optimizing inventory levels, contributing to both cost savings and improved customer service. Furthermore, the real-time access to stock information, facilitated by the system, empowers decision-makers with accurate data for informed planning and resource allocation. This access to information is also emphasized by Nani and Ali (2020) as a determinant of effective e-procurement systems.

The study also found that electronic materials management has improved demand forecasting and material usage efficiency at Mukwano. This is consistent with the principles of lean manufacturing and efficient resource utilization, as discussed by Wisner et al. (2021). Accurate demand forecasting enables proactive procurement and prevents overstocking or stockouts, leading to optimized inventory holding costs. Improved material usage efficiency, facilitated by better tracking and control, minimizes waste and reduces overall production costs. This efficiency gain is further amplified by the system's ability to streamline restocking processes, ensuring timely replenishment of materials and minimizing disruptions to production.

Moreover, the study revealed that electronic materials management has strengthened inventory control at Mukwano through barcode and RFID technology. This aligns with the increasing adoption of advanced technologies in supply chain management, as noted by Mavidis and Folinas (2022) in their review of public e-procurement. Barcode and RFID technology automate data capture, reducing errors in record-keeping and improving the accuracy of inventory data.

These technologies also facilitate efficient stock audits, ensuring accountability and operational efficiency. The reduction in errors through automation supports the findings of Flechsig et al. (2022) concerning robotic process automation minimizing human error.

Finally, despite challenges such as system downtimes, the overall benefits of electronic materials management at Mukwano, including cost savings and optimized supply chain performance, outweigh the limitations. This underscores the importance of robust system maintenance and support to minimize disruptions and ensure the continued effectiveness of the system. As Ramkumar et al. (2019) suggest, user acceptance and continued use of e-procurement services are crucial for realizing the full potential of these technologies. Addressing the challenge of system downtimes, along with continuous system enhancements, will further solidify electronic materials management as a crucial tool for inventory accuracy and control at Mukwano, contributing to long-term supply chain success.

5.2 Summary of findings

The study findings revealed that electronic tendering has significantly improved supply chain management at Mukwano Group of Companies by enhancing efficiency, transparency, and cost-effectiveness in procurement processes. The majority of respondents agreed that electronic tendering reduces procurement lead times, enhances supplier selection transparency, minimizes errors, improves communication with suppliers, increases cost savings, and enables real-time tracking of tender progress. Key informants further emphasized that the system has streamlined procurement by automating bid submission, evaluation, and contract awarding, leading to faster and more accountable decision-making. Additionally, electronic tendering facilitates competitive bidding, enhances data accuracy, and reduces procurement risks, ultimately optimizing financial resources. Despite the need for continuous system upgrades and training, the overall findings suggest that electronic tendering has transformed procurement operations, making them more efficient, reliable, and secure.

Furthermore, the study findings revealed that electronic order processing has significantly improved supply chain management at Mukwano Group of Companies by enhancing order accuracy, reducing lead times, and streamlining procurement operations. The system has minimized manual errors, expedited approvals, and improved coordination between departments,

leading to greater efficiency in order fulfillment. Real-time updates on order status have enhanced visibility, traceability, and accountability, reducing fraud and unauthorized purchases. Automation has also strengthened supplier relationships by ensuring timely order processing and delivery. Despite minor challenges such as system downtimes and training needs, electronic order processing has proven instrumental in optimizing procurement efficiency and overall supply chain responsiveness.

Lastly, the findings revealed that electronic materials management has significantly enhanced supply chain management at Mukwano Group of Companies by improving inventory tracking, demand forecasting, material usage efficiency, and restocking processes. A majority of respondents affirmed that the system minimizes stockouts, reduces material wastage, enables real-time access to stock information, and enhances procurement planning. Key informants further emphasized that automation has reduced errors in record-keeping, strengthened inventory control through barcode and RFID technology, and facilitated efficient stock audits, ensuring accountability and operational efficiency. Despite challenges such as system downtimes, the overall benefits, including cost savings and optimized supply chain performance, outweigh the limitations, making electronic materials management a crucial tool for inventory accuracy and control.

5.3 Conclusion

In conclusion, electronic tendering has significantly enhanced supply chain management at Mukwano Group of Companies by improving efficiency, transparency, and cost-effectiveness in procurement processes. The system has reduced procurement lead times, minimized errors, and improved communication with suppliers, ensuring real-time tracking and better decision-making. Despite the need for continuous system upgrades and training, electronic tendering has proven to be a reliable and secure tool for optimizing procurement operations and financial resources.

Furthermore, electronic order processing has streamlined procurement by enhancing order accuracy, reducing lead times, and minimizing manual errors. Automation has improved coordination between departments, strengthened supplier relationships, and increased accountability through real-time updates on order status. Although challenges such as system

downtimes persist, electronic order processing has significantly contributed to procurement efficiency and overall supply chain responsiveness.

Finally, electronic materials management has greatly improved inventory control by minimizing stockouts, reducing material wastage, and enhancing procurement planning. The system has strengthened inventory tracking, demand forecasting, and record-keeping, ensuring operational efficiency and cost savings. While occasional technical issues arise, the overall benefits of electronic materials management in optimizing supply chain performance outweigh its limitations, making it an essential tool for inventory accuracy and control.

5.4 Recommendations

Based on the results of the study, the following recommendations are provided towards examining the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies.

The study recommends the need to continuously upgrade the electronic tendering system to ensure it remains relevant and efficient in streamlining procurement processes. Regular system updates will help address any technological gaps, improve user experience, and keep the platform aligned with evolving industry standards, ultimately enhancing procurement efficiency, transparency, and cost-effectiveness.

The study also recommends the need for comprehensive training programs for employees and suppliers involved in the electronic tendering, order processing, and materials management systems. Ongoing training will ensure that all users are well-versed in the functionalities and best practices of these systems, leading to minimized errors, increased system adoption, and more efficient procurement operations.

Furthermore, the study recommends the need for enhanced system reliability and support infrastructure to reduce instances of downtime and technical issues that could disrupt supply chain activities. Ensuring that the electronic systems are supported by robust technical support teams and contingency plans will improve system uptime and minimize operational disruptions, allowing for smoother procurement and order fulfillment processes.

More so, the study recommends the need for further investment in automation and data analytics to enhance procurement planning, inventory tracking, and demand forecasting. By leveraging advanced data analytics and automation technologies, Mukwano Group can further optimize its inventory management, minimize stockouts, and reduce material wastage, leading to greater supply chain efficiency and cost savings.

In addition, the study recommends the need for strengthening supplier relationships through better communication channels enabled by electronic order processing and tendering systems. Ensuring that suppliers are promptly informed about order statuses, tender results, and delivery requirements will build trust, improve collaboration, and ensure timely deliveries, further enhancing supply chain responsiveness and operational efficiency.

Finally, the study recommends the need to invest in integrated supply chain technologies that link electronic tendering, order processing, and materials management systems into a unified platform. This will ensure better data flow, improved coordination among departments, and faster decision-making, leading to an even more streamlined and responsive supply chain system.

5.5 Areas for further research

This study aimed at examining the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies. Therefore, the study recommends the following areas of further research;

- Further research should explore the long-term impact of e-procurement systems on supplier performance and relationship management, particularly focusing on how these systems influence supplier collaboration, trust, and service delivery.
- Additionally, further research could explore the integration of e-procurement with other enterprise systems such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) to assess their collective impact on supply chain efficiency.
- Further studies could also investigate the challenges and opportunities of implementing e-procurement in small and medium-sized enterprises (SMEs) compared to large corporations, particularly in developing countries, where technological infrastructure may vary.

- Finally, exploring the role of e-procurement in sustainable supply chain management, including its effect on reducing environmental impacts and promoting ethical sourcing, could provide valuable insights into the future of procurement practices.

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APPENDICES

Appendix 1: Questionnaire

For selected employees of Mukwano Group of Companies

Dear sir/madam

My name is Ankunda Gloria; I am a bachelor's student of Procurement and Logistics Management at Uganda Christian University. I am conducting a study on "the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies." You have been specifically selected to participate in this study and the information collected shall be purely for academic purpose and treated with the highest level of confidentiality. The success of this study shall greatly dependent on your response. Your cooperation shall highly be appreciated.

Section A. Bio Data

Tick where applicable

1. What is your gender?

a) Male ☐ b) Female ☐

2. What is your age group?

a) 21-30 years ☐ b) 31-40 years ☐

c) 41-50 years ☐ d) Above 50 years ☐

3. What is your highest level of education?

a) Diploma ☐ b) Bachelor's ☐

c) Master's ☐ e) Others specify:……

4. Which department do you belong to in Mukwano Group of Companies?

…….

5. How long have you been working with Mukwano Group of Companies?

a) Less than 1 year ☐ b) 1-5 years ☐

c) 6-10 years ☐ d) Above 10 years ☐

Note: In the following sections, rate your degree of agreement on each statement under each objective using a scale of 5(Strongly Agree), 4(Agree), 3(Not sure), 2(Disagree) and 1(Strongly Disagree).

Section B: Electronic Procurement Activities

	Questions	**Responses**				
s.no	**Electronic tendering**	**5**	**4**	**3**	**2**	**1**
1	Electronic tendering has reduced the time taken to complete procurement processes in our department.					
2	The electronic tendering system enhances transparency in supplier selection.					
3	Electronic tendering has minimized errors in the tendering process.					
4	The electronic tendering system facilitates better communication with potential suppliers.					
5	The use of electronic tendering has increased cost savings in our procurement activities.					
6	Electronic tendering enables effective tracking of tender progress in real-time.					
s.no	**Electronic order processing**	**5**	**4**	**3**	**2**	**1**
1	Electronic order processing has improved the accuracy of order fulfillment in our department.					
2	The system allows for faster approval and processing of orders.					
3	Electronic order processing reduces delays in order delivery.					
4	The platform provides real-time updates on order status					
5	Electronic order processing has decreased paperwork and manual					

	errors in our department.					
6	The system enhances coordination between departments involved in order management.					
s.no	**Electronic materials management**	**5**	**4**	**3**	**2**	**1**
1	The electronic materials management system has improved inventory tracking in real time.					
2	The system helps in accurately forecasting material requirements.					
3	Electronic materials management reduces wastage of materials.					
4	The system enables quick access to information on stock levels and locations.					
5	Electronic materials management has streamlined our restocking processes.					
6	The electronic materials management system helps in minimizing stockouts and overstock situations.					

7. In your view, how else does electronic tendering affect supply chain management in Mukwano Group of Companies?

……
……

8. In your opinion, how else does electronic order processing affect supply chain management in Mukwano Group of Companies?

……
……

9. In your view, how else does electronic materials management affect supply chain management in Mukwano Group of Companies?

……
……

Section C: Supply Chain Management of Mukwano Group of Companies

	Statements	Responses				
s.no	**Supply chain management**	**5**	**4**	**3**	**2**	**1**
1	E-procurement activities have improved the overall efficiency of our supply chain.					
2	The adoption of e-procurement has led to cost savings in supply chain management.					
3	E-procurement has enhanced the accuracy of information shared across supply chain processes.					
4	Our supply chain is more responsive to changes in demand due to e-procurement activities.					
5	E-procurement has strengthened collaboration with suppliers in our supply chain.					
6	E-procurement has improved the reliability of supply chain operations at Mukwano Group of Companies.					

7. How else can you describe the management of the supply chain in Mukwano Group of Companies other than the ones mentioned above?

……

……

8. What challenges have you faced in managing the supply chain processes within the organization and how have you dealt with these challenges?

……

……

Thank you very much for your cooperation

Appendix 2: Interview Guide

For Key Informants

Introduction

Dear sir/madam

My name is Ankunda Gloria; I am a bachelor's student of Procurement and Logistics Management at Uganda Christian University. I am conducting a study on "the impact of e-procurement activities on supply chain management of companies: a case of Mukwano Group of Companies." You have been specifically selected to participate in this study and the information collected shall be purely for academic purpose and treated with the highest level of confidentiality. The success of this study shall greatly dependent on your response. Your cooperation shall highly be appreciated.

Section A: Introductions

1. Tell me about yourself (*age and level of education*)
2. What position do you hold in Mukwano Group of Companies?
3. How long have you worked with Mukwano Group of Companies?

Section B: The effect of electronic tendering on supply chain management in Mukwano Group of Companies

4. In your experience, how has the adoption of electronic tendering impacted the efficiency of supplier selection and procurement processes in the company?
5. What challenges, if any, have you observed in the implementation of electronic tendering, and how do they affect supply chain operations?

Section C: The effect of electronic order processing on supply chain management in Mukwano Group of Companies

6. How has electronic order processing influenced order accuracy and lead times in Mukwano Group of Companies?
7. Can you describe any improvements or limitations in interdepartmental coordination that have resulted from electronic order processing?

Section D: The effect of electronic materials management on supply chain management in Mukwano Group of Companies

8. How has electronic materials management contributed to inventory accuracy and control within the company?
9. What impact has electronic materials management had on reducing material wastage or minimizing stockouts in the supply chain?

Thank you for your cooperation