

**EFFECT OF ELECTRONIC PROCUREMENT ON OPERATIONAL
PERFORMANCE OF PHARMACEUTICAL MANUFACTURING FIRMS
IN KENYA**

BY

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged

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I do hereby confirm that I have examined the master’s dissertation of;

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And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed

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DEDICATION

I dedicate this dissertation to my mother who laid down a solid foundation, coupled with her continuous support in my academic journey this far.

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LIST OF ABBREVIATIONS AND ACRONYMS

B2B	Business-to-Business
B2C	Business-to-Consumer
GDP	Gross Domestic Product
ICT	Information Communication Technology
IFMIS	Integrated Financial Management Information System
IT	Information technology
OECD	Organization for Economic Co-operation and Development
PPOA	Public Procurement Oversight Authority
R&D	Research and Development
RBV	Resource Based View
ROK	Republic of Kenya

OPERATIONAL DEFINITION OF TERMS

Electronic auction includes automated bids and electronic offers resulting into competitive prices for goods and time saving (Sheng, 2002).

Electronic payment is secure, real time and it require the use of electronic wallets with a high level of interoperability (Williams & Hardy, 2007).

Electronic procurement includes e-sourcing, e-tendering, e-auction and e-payment that collectively work together to streamline procurement processes in the firm (Muhia & Afande, 2015).

Electronic sourcing it is the use of internet (web-sites) to identify, prequalify and register suppliers, request for proposals and receive/share quotations online (Sheng, 2002).

Electronic tendering it include advertisement of tenders online, shortlisting of tenders online, evaluation of suppliers online and selection of potential and qualified suppliers through the internet (Chan & Lu, 2004).

Operational Performance helps to save on costs, enhance customer responsiveness and reduce lead times (Hendriks, 2012).

ABSTRACT

Procurement has been proved to be one of the most strategic units for various organizations. Applying it properly can help to cut down costs to improve the profitability of these firms. The study sought to establish the effect of e-procurement on the operational performance of pharmaceutical manufacturing firms in Kenya. The research was conducted using a descriptive cross-sectional survey approach. Due to the small number of pharmaceutical manufacturers in Kenya, a census was conducted since the population is relatively small. The research relied on primary data with the use of a questionnaire to collect data. The survey included both open-answer and non-answer-answer questions that elicit specific answers for qualitative and quantitative analysis. Quantitative data on e-procurement collected from the population was coded using the numerical scale used by respondents when answering questionnaire questions. This allowed us to transform the data into a quantitative format and apply a quantitative approach. In the analysis, descriptive metrics such as central tendency and dispersion were used. To assess the link between the independent factors and the dependent variable, the data was put to a multi-linear regression equation model. The study established that that electronic sourcing ($\beta=1.026$, $p<0.05$), electronic tendering ($\beta=.416$, $p<0.05$) and electronic payment ($\beta=.205$, $p<0.05$) were all significant as far as operational performance of the pharmaceutical firms was concerned. The study concludes that e-procurement significantly predicts operational performance. The study recommends that procurement managers working in the pharmaceutical manufacturing firms in Kenya should enhance the existing e-sourcing platforms to improve on operational performance. An improvement on e-tendering among pharmaceutical manufacturing firms in Kenya is also required in order to enhance operational performance. The procurement managers of the pharmaceutical manufacturing firms in Kenya should partner with electronic payment platforms like Pesapal to support e-payment.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

For many firms, procurement has proven to be one of the most strategically important departments. Effective application can reduce significant costs and increase these businesses' profitability. High performance requires effective supply chain expertise, which calls for end-to-end understanding of performance measures like cash-to-cash cycle time, total supply chain cost, or flawless order fulfillment (Madzimure, Mafini & Dhurup, 2020). To better monitor the entire performance of supply chains, most companies have continued to use electronic procurement to take advantage of the internet's competitive advantages. Managers must comprehend the influence of technology and become proficient in e-procurement techniques (Faheem & Siddiqui, 2019). E-procurement elevates supply management's profile and makes it more visible to upper management (Wu & Chien, 2016). Examples of e-procurement include enterprise resource planning, maintenance, repair, and operation, e-bidding, reverse auctions, information, and e-marketplaces.

The past two decades have therefore, seen most manufacturing firms prioritizing on improving procurement functioning (Mose, 2012). Pharmaceutical industries have not lagged in utilizing efficient procurement practices to reap the associated benefits and become more profitable. Electronic procurement has remained one of the most functioning in the recent years, and the pharmaceutical industries continue to embrace it. E-procurement targets contract compliance to reduce the costs. It leverages reduced transactional costs and unit pricing to achieve the desired costs. Despite putting all these efforts in place, these firms overlook several fundamental components, limiting profit maximization. They have continued to pay little attention to productivity, quality and the overall costs. These contribute significantly low gains than anticipated. Kiusya, (2018) notes that e-procurement is becoming a crucial component in

improving the management of procurement and supply chain practices. These are seen in reduced costs, and improved efficiencies and effectiveness of the entire supply chain practices. Still, it requires proper management to achieve these anticipated benefits.

One innovation that is essential for enhancing operational performance is e-procurement. Over the past ten years, the operations of pharmaceutical companies in Kenya have altered significantly. Both international and local competitions have made them see the need to work hard to meet the demands of the dynamic market demands and customer bases. They have endeavored to adopt and adjust in the dynamics of changing technologies and customer knowledge. These efforts have resulted in a rise in the operation costs. Finding a balance between customer satisfaction and operational costs has become challenging. Proper operational management of these firms is thus crucial. As shared by Waganda (2018), e-procurement is one of the most effective tools for improving the effectiveness of operations. This study aims to determine a connection between the performance of Kenyan pharmaceutical companies and the usage of electronic procurement.

1.1.1 Electronic Procurement Practices

E-procurement is the purchase of sales and supplies through the use of IT resources such as the internet, Electronic Data Interchange, and Enterprise Resource Planning. It may take place between business and consumers, business and business, and business to government. It may involve the sale or purchase of services, work, and supplies. According to Ngeera, (2016) e-procurement comes at the end of a transaction, because it is IT based. It is associated with reduced cost and improved time efficiencies. These advantages have made it earn significant popularity businesses today. E-procurement offers a range of solutions that encourage supply chain purchases and improve management by managing the purchase cycle and connecting buyers to the external

and internal environments of the supply chain. Which is (CIPS, 2014). Egbu (2003) defined e-procurement as the act of making purchases of commodities, services, and information online. Electronic procurement is the term for the use of ICT during the procurement phase of identification, contract negotiation, ordering, delivery, and inspection, as well as after-sales service. Brandon-Jones and Croom (2004).

Implementing electronic procurement makes it easier to evaluate the end-to-end trade cycle, expands the market through the electronic market, shortens procurement time, eliminates traditional procurement inefficiencies and costs, and makes it into the procurement process. Profitable and improved. The method was the cause. Electronic sourcing has improved the efficiency and effectiveness of sourcing, which has improved supply chain performance (Manrodt, Gibson & Stephen 2005). The implementation of electronic procurement systems is carried out to manage and carry out procurement activities. This electronic software and system integrates procurement capabilities and supply chain activities, and the created interface can be used as a performance measure to track the status of activities in real time (Manrodt et al., 2005). Process automation speeds up transactions by increasing liaison between procurement offices and suppliers, improves relationships, provides proof of transactions, and reduces paperwork and associated costs. There are also advantages such as Egbu, Vines & Tookey (2003). Depending on how your organization purchases, eprocurement can be systematic or spot sourcing. Due to the usefulness and customizability of e-procurement, many organizations have: Private, public and non-governmental organizations to implement electronic procurement systems. E-procurement practices include e-procurement, e-procurement, e-request, and e-payment.

Masheti, (2016) notes several categorizations of e-procurement including e-auction, brokerage, electronic integration, purchase process management, e-tendering, e-informing, purchase order

integration, and vendor management among others. It has integrated supply chain process into one, realizing effectiveness and efficiency. Connecting buyers to suppliers via a simple web software has seen many businesses cut down on cost significantly. It has assisted in removing the barriers of procurement practices especially in international business environment.

1.1.2 Operational Performance

Performance is how well a company accomplishes its stated goals and objectives within a predetermined time frame (Gopal & Thakkar, 2016). According to Blazey (2009), Blazey (2009) relates an organization's efficiency to defined measurements of policy or efficiency, effectiveness, and environmental responsibility (waste reduction, productivity, regulatory compliance, cycle atime). Defined as the performance of your organization. He further shows that operational performance is a common dependent variable used by managers and researchers to compare a particular organization to its competitors. Aspects including innovation, logistics, human resource development, advertising strategy, customer service, image or reputation, corporate social responsibility, contract management, supplier relationships, and communication can affect a company's management's success.

Weele (2006) asserts that the effectiveness and efficiency of the procurement process determines how well the purchasing process performs. It is typical for an organization to evaluate its performance based on its specified goals and the areas where it needs to improve before deciding to implement strategies to improve its performance. Gardenal (2013) identified an evaluation technique for e-procurement based on a set of metrics from five impact areas to assess an organization's success. E-procurement benefits a company most in areas such as transparency, dematerialization, efficiency, competitiveness, and effectiveness.

Schiele (2007) asserts that a company's operational performance in terms of procurement indicates how well its procurement objectives have been met. There are two primary components to this. Effectiveness and efficiency. For instance, different metrics are considered while determining procurement effectiveness costs associated with gathering information about products and services, finding high-quality products and services, being flexible with order turnaround times, and lead times for product and service delivery. Effective operational performance measurements in sourcing, according to Deva deva (2008), assist managers in making better sourcing choices necessary to increase performance and accountability. This enhances the evaluation of different sourcing options and the optimal resource allocation, providing you more operational freedom. Shalle et al. (2014) came to the conclusion that the operational performance of procurement can be evaluated by putting an emphasis on delivery time, flexibility, quality, and cost. How you manage your present supplier connections to assure the ongoing availability of the high-quality goods required throughout your business will determine how well you perform in terms of sourcing. By doing this, you may be sure that the materials you buy were truly acquired at a fair price and at the appropriate time. In order to save time and money and improve the quality of the company's goods and services, procurement operations track record aims to enable improvements in the sourcing process inside an organization.

The success of businesses across industries has been conceived as being significantly influenced by operational performance. The best way to characterize it is as the degree to which all business units inside an organization collaborate to achieve key business objectives (Kirui, 2019). It is the coordination of all organizational functions to ensure that they collaborate to achieve efficiency and effectiveness. Shifting towards technological innovation such as e-procurement will present significant benefits to the performance of an entity, making it more profitable and competitive. An

organizational management system can be used to successfully manage operational performance. Quality circles, balanced score cards, and best practices are some of the most regularly used methods for monitoring operational performance. These strategies entail a series of recurring activities that are used to build organizational goals. The activities are crucial in tracking a company's progress toward its goals and objectives (Mohanty, 2008). The operational performance measures in this study will be lead time, cost, and customer responsiveness.

1.1.3 Electronic Payment

Despite the gains in efficiency from supply-chain investments, these improvements fall short of completely replacing manual financial transactions. The use of automated payment systems has been growing in many organizations today. They are offered by various vendors such as Visa. Still, they have not seen much change in improving the efficiencies of the organizations using them. Payment has not been incorporated into the majority of organizations' supply chains, leading to inefficient financial operations. This is a strange oddity. Later, will prove that automated payment improve the whole procurement process in the supply chain. The majority of businesses continue to rely on non-automated payment options leading to increased costs to initiate, track, and reconcile. Given the magnitude of these money flows, it's remarkable that most businesses place such a low premium on payment. Payments made through the banks of each party should be viewed as a crucial link in the supply chain. Managing accounts payable (A/P) and accounts receivable (A/R) is challenging when every supplier employs paper-based payment systems. For instance, a UK tea distributor would purchase £2 million worth of tea each quarter from an Asian supplier. There could be six different invoices from the provider represented by this number. However, due to fluctuations in exchange rates, the tea company may aggregate all of these bills

into a single payment, which the supplier may find challenging to match up with the several invoices it has outstanding with the tea company. When it comes to balancing its own accounts receivable, the tea company faces similar difficulties. In most circumstances, businesses will attempt to connect remittances to invoices for their suppliers, but this will take time and resources. Integrating supply chain management with electronic invoice presentment and payment (EIPP) systems helps businesses save time and money. Businesses can use EIPP capabilities to review accurate invoice-level data and remittance information. This prevents the mistakes that are frequently made with manual procedures. Businesses can handle payment information using Web-based tools and electronic payment systems from Visa and other providers. Treasury departments now have access to line-item data on all of their billing and expenditures, including those for travel, recreation, purchases, and high-value transactions.

1.1.4 Pharmaceutical Industry in Kenya

The Pharmacy and Poisons Act 244 of Kenyan statutes, which was passed by an act of parliament, established the Pharmacy and Poisons Board (PPB), which oversees the pharmaceutical industry in Kenya. Drug processing, shipping, and trade are all governed in an effort to meet high standards for quality, safety, and efficacy (Pharmacy & Poisons Board, 2016). The pharmaceutical industry is composed of three main segments: manufacturing, distributing, and retailing, and it has been continuously developing, thanks to the government's efforts to promote, grow, and extend the industry through both domestic and international investment (Economic Survey, 2016). Nairobi County is home to 22 of the world's leading manufacturing firms (Ministry of Health, 2016). The industry has evolved, and players must employ a variety of marketing techniques in order to maximize profits and stay ahead of the competition.

Kenya's pharmaceutical industry is primarily owned by manufacturers, distributors and retailers. All these parties are making effective contributions to ensure that the country has access to effective medicines that do not affect people's lives. According to the Pharmacy & Poisonous Board (2013), Kenya is considered one of the largest pharmaceutical manufacturers in Africa, supplying more than 50% of the region's medicines. About 50 pharmaceutical manufacturers are registered in the Common Market for Eastern and Southern Africa (COMESA), 30 of which are thought to be situated in the Kenyan market (Pharmacy & Poisonous Board, 2013).

The players in the market consist of local manufacturers and international corporations as well as joint ventures which form part of the 30 companies in the country. Changes have been seen in the sector due to increased market liberalization and entry of new players in the industry which has been blamed for the poor performance of the sector and malpractices which has seen rise of illegal pharmaceutical drugs in the country. Measures put in place by the government such as improved medical supply has slightly improved the sector, however, more work still remain to be done through strategy implementation (Ageron et al., 2013).

From \$ 229 million in 2008 to \$ 359 million in 2013, the Kenyan pharmaceutical market is anticipated to increase. This translates into a 9.34% compound annual growth rate (CAGR). Improved health care availability, higher out-of-pocket expenses (both in terms of quantity and value), and more government participation in health concerns are the key forces behind market expansion (Business Monitor International, 2009). The pharmaceutical sector in Kenya is made up of a variety of stakeholders. Local manufacturers, distributors, wholesalers and retailers as sources of medicines. Public hospitals, non-governmental organizations (NGOs) involved in healthcare, commercial hospitals, mission hospitals, and the general public make up the major markets for pharmaceuticals. The Pharmacy and Poisons Commission is the oversight agency created by

Kenyan law's Chapter 244 regulating pharmacies and poisons (PPB). Regulators are in charge of overseeing pharmacy procedures, as well as the production and distribution of drugs and dangerous substances. In order to respond to inaccurate information reported by the media and rectify it more frequently, PPB has recently had to spend more on paid advertising in print media. To support the sensible use of medications, the PPB goes a step further and seeks to ensure that drug information is objective, accurate, up-to-date, and readily available to prescribers and consumers.

Established a unit (Board, 2016). This shows that the demand for pharmaceutical information is growing rapidly and that the Kenyan pharmaceutical industry needs to respond appropriately to the demand for information. In March 2009, there were many reports in the media that cough syrup was not safe for children. These media reports went further, arguing that cough medicines could even lead to the death of children. These media reports were the result of announcing that Agakhan University Hospital had decided to withdraw cough syrup from the hospital's prescription. The chair of the pharmacy and poison committee issued a statement in response to media reports that cough syrup is causing panic among the general public. He states: "The information presented in recent media reports does not reflect the true position of cough and cold medicine in Kenya and around the world. Therefore, parents and guardians do not have to worry or panic because syrup is not toxic or dangerous when taken as recommended "(Board, 2016). The pharmaceutical industry has also made a positive contribution to Kenya Corporate Social Responsibility Activities, Price Cuts, Introducing new cheap medicines in equally accepted markets Media coverage (Mbogo, 2011).

1.2 Research Problem

Even though advancement in technology and globalization has contributed to increasing popularity of e-procurement, many firm continue to lag. They continue to use old manual procurement techniques which is linked to numerous inefficiencies. According to studies done by Malela (2010), most firms in the private sector in Kenya have not realized the value of e-procurement. They continue to use manual processes, which are costly, time consuming, and inefficient. These leads to inadequate storage and retrieval of data. It has contributed to poor performance in supply chain, especially among the manufacturing pharmaceutical firms. Pharmaceuticals manufactured in certain lots, including Gentamed injection lot numbers 170611 and 170603, Caregenta80 injection lot number 171160, and Dawagenta injection lot number 170754, are expected to expire in 2018, according to pharmacy and poison committee statistics. Was recalled when 2020. These drugs were manufactured in Kenya in 2017 and are used to treat pneumonia (Pharmacy & Poisons Board, 2018).

The studies that are now available include Jayawardhena and Jayaratne's (2019) investigation of Sri Lanka's garment industry's e-procurement and supply chain performance. The results demonstrated that e-procurement had a favorable effect on the operational effectiveness of the garment sectors. A substantial correlation between supply chain performance and e-procurement practices was found in the study by Faheem and Siddiqui (2019). Harelimana (2018) concentrated on public sector organizations in Rwanda to establish a direct connection between e-procurement and performance. The study carried out in South Africa by Madzimure, Mafini and Dhurup (2020) looked at e-procurement and supply chain performance focusing on smaller entities where a significant link was noted.

Barngetuny and Kimutai (2015) used a case of Elgeyo-Marakwet County to link e-procurement and supply chain management performance documenting a significant link. Waganda (2018) covered the United Nations Agencies based in Nairobi to link e-procurement and performance. To combine e-procurement and supply chain effectiveness, Aseka (2019) focused on the food manufacturing businesses in Nairobi. Kerubo (2017) evaluated e-procurement and supply chain using a case study approach similar to the Kisii County Government. Oteki (2019), while covering the sugar processing businesses in Kenya, concentrated on e-procurement methods and supply chain performance.

The reviewed studies raise contextual, conceptual and methodological gaps, and some were done in other countries like Sri Lanka and South Africa and not in Kenya. Other studies covered different concepts like organizational performance and supply chain performance and not operational performance. There are other studies that adopted case study methodologies unlike the present study. The current study set out to determine the relationship between operational performance and electronic procurement in Kenyan pharmaceutical manufacturing enterprises in order to close these gaps in knowledge.

1.3 Research Objectives

The study had general and specific objectives as under:

1.3.1 General Objective

The general objective of the study was to establish the effect of electronic procurement and operational performance in pharmaceutical manufacturing firms in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives

- i. To establish the effect of e-sourcing on operational performance in pharmaceutical manufacturing firms in Kenya
- ii. To analyze the effect of e-tendering on operational performance in pharmaceutical manufacturing firms in Kenya
- iii. To determine the effect of e-auction on operational performance in pharmaceutical manufacturing firms in Kenya
- iv. To find out the effect of e-payment on operational performance in pharmaceutical manufacturing firms in Kenya

1.4 Research Questions

The following research questions were used to guide the study:

- i. What is the effect of e-sourcing on operational performance in pharmaceutical manufacturing firms in Kenya?
- ii. How does e-tendering affect operational performance in pharmaceutical manufacturing firms in Kenya?
- iii. To what extent does e-auction affect operational performance in pharmaceutical manufacturing firms in Kenya?
- iv. What is the effect of e-payment on operational performance in pharmaceutical manufacturing firms in Kenya?

1.5 Significance of the Study

The findings of the study would be important to the following parties:

This study is relevant to regulators such as pharmacies and the Poisons Commission (PPB), to regulate the pharmaceutical sector by developing effective policies and regulations that promote

the performance of these companies. We recommend the possible method. This will provide a sustainable competitive advantage for companies involved in the manufacture of pharmaceuticals.

The study would establish how best the management team of manufacturing pharmaceutical firms in can leverage on e-procurement and enhance operational performance. The study would recommend the best e-procurement platforms that would help these companies enhance their operations. Based on the results of this study, the management of these companies makes relevant informed decisions about eProcurement and how it leads to supply chain performance.

The findings of this study may be important to future researchers in the field of supply chain and procurement by acting as an empirical source of literature for their studies. In addition, the study will contribute to future discourse on operational performance by identifying existing gaps that future scholars can concentrate on. This will help promote the growth of literature and knowledge on e-procurement and operational performance in Kenya.

1.6 Scope of the Study

E-procurement and operational performance were the study's main topics. The study concentrated more on the relationship between operational performance and e-sourcing, e-tendering, e-auction, and e-payment. The study was carried out specifically with regard to Kenya's pharmaceutical manufacturing companies. 30 businesses in all were included in the survey. The investigation used data from first-hand sources. The survey was conducted in each company's head office, which for the majority of pharmaceutical companies was in Nairobi. The investigation was carried out in July 2021.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The aim of this chapter is to review literature on the theories that are relevant to the current inquiry. The past studies are reviewed to bring out the gap which the current is set out to address. The conceptual framework is also indicated with a discussion of the variables together with the indicators.

2.2. Theoretical Literature Review

Three theories guided this study. These are the resource-based view theory, transaction cost theory and the network theory.

2.2.1 The Theory of Resource-Based Review

The Resource Based View idea can indeed be directly traced to authors such as Penrose (1959), Barney (1991), and Rapert and Suter (1993). (1996). Scholars claimed that the organization has the highest possibility of accomplishing goals. According to the theory, the best results are obtained when existing resources are used rather than external resources. The idea also emphasizes that a resource must be diversified in nature and not transportable in order to successfully change from a relatively brief competitiveness to a long-term competitive edge. It makes a speciality of an organization's cap potential to provide merchandise that aren't replicable and can not be replaced. This function lets in a organization to preserve its aggressive benefit all through time, making sure lengthy-time period viability. IT (statistics era) has lengthy been in price of deliver chain control and procurement.

The addition of RBV is advised by Kozlenkova, Samaha, and Palmatier (2014) to assess the long-term viability of IT resources. This is because RBV focuses on providing unique, uncommon, valuable, and non-substitutable items through data generation. The principle also requires stationary and diverse assets. Long time period comparative benefit sustainability rises numerous issues concerning assets. These consist of insufficient skills for awesome product creation, social complexities ambiguities, and inadequate pleasant competencies and understanding amongst man or woman employees.

Other groups may also locate it hard to duplicate the assets generated from statistics era due to the fact they lack the important abilities to learn, understanding inside the organization, and time factor. IT industry's want to provide key words. The principle is vital to have a look at because it makes a speciality of a way to growth and hold aggressive benefit in firms with the aid of using leveraging IT.

2.2.2 The Theory of Transaction Cost

Advanced by Coase in 1937, transaction cost theory argues that any transaction conducted within the market is linked with costs. At any time whenever there is the transfer of products between stages transaction costs must be incurred. It is only when the transaction costs of adopting technologies are less than manual systems when the firm can be able to adopt electronic procurement platforms. With regard to this theory, Nepelski (2006) shared that the adoption of technologies is likely to lower the costs incurred when suppliers are sought, selected and monitored. Economic transactions that lead to transaction costs arise due to two entities, institutions and markets.

There are many studies focusing on transaction costs (for example, some authors have investigated the relationship between transaction costs and the reliability of supplier-customer relationships- West Exit, 1994; Gulati, 1995, optimistic behavior and transactions. There is extensive research on the correlation between Cost-Hill, 1990). However, the number of studies focused on calculating transaction costs for public procurement is limited, and such information is fairly scarce in the Czech and Slovak literature. In the Czech literature, only one author, Jan Pavel, systematically examines the transaction costs of public procurement. Transaction costs were the subject of habituation (2007) and focused research projects (2013). Together with Vitek (2016), he estimated the transaction costs of the public sector and the direct transaction costs of private companies. Their results are less optimistic, with these two (or more) transactions cost categories accounting for about 1.5% of GDP.

This is consistent with the anticipated savings (the difference between the estimated price and the contract price). An organization must pay transaction expenses as part of the standard procurement process, for example, when the company tries to get contracts. According to the principle, businesses exist to minimize their transaction costs. To get the best value for any supplies purchased on the entity's behalf, procurement departments are set up. By implementing technology, such as electronic procurement, a business can reduce transaction costs in the procurement process more effectively than any other method. In order to maximize operational performance, this theory will be employed to support the independent variable e-procurement and demonstrate its value in lowering transaction costs.

2.2.3 Network Theory

The theory was created by Wasserman and Faust in 1994, and its central idea is on how to foster cooperation and trust in order to raise the degree of efficiency. Supply chain is viewed as network since it comprises of different actors including the buyers and suppliers and customers. All these parties within the supply chain need to cooperate and form relationship while working together with each other for realization of optimal operational performance. The network comprises of different actors that although independent, they work together for common purpose.

For example, if A is married to B and B is a close friend of C, then A and C could be at least acquaintances. According to Granovetter, the underlying cause of bond formation incorporates this kind of transitivity. People often identify as homosexual, for instance. In other words, they feel particularly connected to those who are like them (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin & Cook, 2001). If A and B are comparable, and if B and C are comparable, then homosexuality is weak and transitive because A and C are probably also comparable. This also induces weak transitive relations to the tie structure, as long as the tie is caused by similarity.

The theory provides information on the relationship that an entity has with other firms and how this link shape the outcomes and behavior (Thorelli, 1986). The management of inter-organizational ties is critical to success, and businesses should select suppliers who are vital to the network. The continuation or dissolution of partnerships is influenced by differences in national cultures, attitudes toward cooperation, and readiness to trust outsiders (Park & Ungson, 1997). Intra-firm and inter-firm networks are an important aspect of the overall economic structure in nations like Japan and South Korea (Gerlach, 1992). As a result, supply chains can be represented as a network with a network of points that represent independent product lines as firms with the

ability to make sovereign decisions and a collection of linkages that join these firms for the goal of producing goods and services (Hearnshaw & Wilson, 2006). The dependent variable operational performance will be anchored using this theory.

2.2.4 Systems Theory

Regarding the first of the theory's ten guiding principles, there are two things that businesses should take into account when it comes to supply chains. The supply chain is long according to that link, as evidenced by the fact that a third, fourth, or higher logistics provider is involved, according to this premise (Copacino, 1997: p. 43; Foster, 1999: p.35; Parker, 1999: p.17)., Supply chains are less likely to adapt to the potential for changes needed to survive, as discussed by various scholars (as discussed by various scholars). Forrester, 1961; Senge, 1990; Fowler, 1999), the "physics" of systems restricts their potential for emergence and their potential for success. The supply chain functions for other organizations, according to the second system theory principle. (Chase 1998: p.70; Lawrence 1999: p.52; Stundza 1999: p.69; Stundza 1999). To streamline processes, new technologies like vendor-managed inventories are being introduced. By acting (Holmstrom, 1998: p. 3). More managerial resources are required for a highly active supply chain. Make sure they get advantages over chains with little activity. The third principle asserts that rather than an organization's monolithic deliverables, the supply chain can be divided into multiple smaller subsystems.

This idea was also used by Yourdon (1989) to construct structured system approaches. Instead of being viewed as distinct static components of a standard supply chain model, an organization's strategy/structure, information technology, and human factors are actually within the supply chain (Caddy and Helou, 1999). It can be viewed as a dynamic subsystem that engages in interaction.

system. Information systems are artificial structures, but they actually expand, according to the Fourth Principle of Systems Theory (Yourdon 1989). Regarding the supply chain, a rise in the volume of products, services, information, or knowledge exchanged could occur.

In addition, organizations must understand that supply chains and information systems are man-made structures rather than living processes. They are not static because of this. They interact with the shifting external environment, which makes them undoubtedly very dynamic and prone to evolution and change over time. The supply chain is taken into account in regard to the aforementioned four general systems theory principles that were used in the field of information systems by Yourdon (1989). These examples demonstrate how a deeper comprehension of supply chain management and its administration is possible. The four guiding principles of this theory apply to information systems from a supply chain perspective, making it pertinent to this subject. However, supply chain e-business performance is one of the surveyed indicators. Therefore, there will be researchers insights during the analysis of the data.

2.3. Empirical Literature Review

An empirical analysis of the variables the study used is provided in this section. By utilizing IT, e-Procurement contributes to value creation. According to Bailey (2008), there are seven ways to categorize e-procurement: employing IT software to create and approve purchase orders, place purchases, and receive goods and services is known as web-based ERP.

2.5.1 Electronic Sourcing and Operational Performance

Using a case study method, Manthou, Bialas, and Stefanou (2016) investigated the associated barriers and benefits of e-sourcing and e-purchasing in the health industry. The research was

carried out in Greece. Despite their having an impact, it was discovered that e-Sourcing and e-Purchasing are still in their infancy in the Greek health care industry. According to Kenya's Public Procurement and Disposal Act (PPDA) Act (2005), procurement departments are responsible for acquiring any form of works, services, or supplies by buying, renting, leasing, hiring purchasing, licensing, tenancy, franchising, or any other commercial mechanism. The second department is Maintenance, Repair, and Operations, which is responsible for formulating and approving and placing purchase orders and receiving non-product related MRO materials. E-sourcing is the third sort of e-procurement, which comprises using IT to find new suppliers for particular purchasing requirements. E-reverse auctioning involves using internet technology to buy items from a number of existing or unnamed vendors, whereas e-tendering entails using IT to submit information requests and prices to suppliers and then get their responses. E-informing, the sixth category, comprises gathering and distributing purchasing information to both organizations and people online.

In Rwanda, Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. The study focused on the telecommunication sector with specific focus on MTN Rwanda. More specifically, the study probed to understand the main e-sourcing technologies that had been adopted, areas of application of e-sourcing and the associated benefits. In total, 265 staff were targeted where 53 were sampled being 20%. Chi-square helped in bringing out the effect linked with e-sourcing on supply chain performance. It was shown that e-sourcing had been adopted in the technological industry in Rwanda and this was meant to manage the available supply chain operations. These technologies include the enterprise resource planning tool and the spend analysis.

Mwangi (2020) provided the connection between e-sourcing and procurement performance using the Independent Electoral and Boundaries Commission case study from Kenya. The study sought a total of 82 respondents, of which 41 were sampled, and utilized a descriptive approach. The findings revealed a strong correlation between e-sourcing and successful procurement. This indicates that implementing e-sourcing will improve the entity's performance in terms of procurement.

A study on strategic e-sourcing and its relationship to supply chain performance was conducted by Kimutai and Ismael (2016) utilizing the Kenya Electricity Generating Company Ltd. as a case study. Cost reduction, strategic supplier relationships, and supply chain risk are among the study's variables. The study used a cross-sectional survey approach, and it was demonstrated that implementing strategic e-sourcing is a crucial step and direction towards improving the firm's supply chain performance.

Ochari and Kwasira (2016) attempted to highlight the connection between e-sourcing and the effectiveness of the procurement function while concentrating on the Nakuru County government. 168 persons were targeted for the descriptive design, and 118 of them were chosen at random to receive samples. It was demonstrated that even though the county government approved the idea of e-sourcing, its complete implementation has not taken place, preventing it from realizing all of its benefits.

2.5.2 Electronic Tendering and Operational Performance

Raventós and Zolezzi (2015) did a study on e-tendering focusing on pharmaceuticals in Chile. The study covered a period of 2001-2006 and panel regression was used to carry out an analysis of 6888 tenders. The study hypothesized that e-tendering engage the market mechanisms effectively

relative to the traditional methods due to reduction in corruption and limited supplier collusion. It was shown from the findings that e-tendering improves performance with the supply chain of the firm. Osir (2016) focused on e-tendering and procurement performance. The variables used in the study included e-awarding, e-ordering and e-invoicing. The focus of the study was on Kenyan State corporations. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance. E-market sites, according to Bailey (2008), are the penultimate category of E-procurement. Purchasing groups, thanks to the link between the supplier's supply chain and the buyer's financial system, access priority supplier goods and services, add shopping carts, create requests, get approvals, and receive purchase orders. , Can process electronic invoices. This study includes ePayments because ePayments are an integral part of the procurement process.

Chegugun and Kibet (2018) examined electronic tendering and its relationship to organizational performance with a focus on public health facilities in the county of Uasin Gishu. The investigation comprised 5 hospitals in all, with 367 serving as the study sample. It was noticed that hospitals now bid more aggressively on tenders thanks to e-tendering. In their 2017 study, Kuloba, Kibet, and Ayuma focused on the Moi Teaching and Referral Hospital in Eldoret and examined tendering practices and their relationship to company performance. A case study methodology was used, and 384 individuals' data were collected. The investigation was anchored by institutional and socioeconomic ideas. It has been demonstrated that tendering positively impacts a company's performance.

In 2016, Oteki, Namusonge, Sakwa, and Ngeno carried out research on the e-tendering and supply chain performance of the companies handling sugar processing in Kenya. The survey comprised 367 respondents and covered 12 different companies in total. In this study, a variety of research

methodologies were used. It has been demonstrated that an entity's supply chain performance is significantly correlated with its e-tendering methods. Using Homa Bay County as a case study, Otieno, Aliata, and Midida (2021) examined e-tendering and its relationship to supply chain performance. From the 400 participants who had been targeted, 196 respondents were selected using a correlational approach. E-tendering success and supply chain effectiveness have been demonstrated to be directly and significantly correlated.

Using Nairobi County as an example, Gathima and Njoroge (2018) discussed bidding and organizational performance. The research was guided by the theories of transaction costs and innovation dissemination. It was done using both descriptive and descriptive study designs. 750 respondents from the financial, payment, and information technology industries made up the target group. 75 respondents from the three departments were chosen through a stratified random selection technique for the study. Questionnaires were distributed to a pre-selected group in order to collect the data. The findings of the correlation study demonstrated that Nairobi City County Government's e-tendering practices had a significant and favorable relationship with performance.

2.5.3 Electronic Auction and Operational Performance

Hanák, Marović and Jajac (2018) were interested in bringing out the link between e-reverse auction and competition in the Czech construction industries. The study sought to see how electronic reverse auctions affected the competitive climate in national infrastructure contracts, as well as the incidences of extremely low bids. The use of auctions minimizes the volume of bidders while raising the likelihood of unusually low bids, according to the findings of a quantitative study on Czech building tenders.

E-auctions were the focus of Hartley, Lane, and Hong's (2004) study of their importance in supply chain management. Reverse electronic auctions are quickly replacing competitive bidding for supplier selection, according to the study's review of the literature. Reverse e-auctions make use of the Internet to let providers compete in real time for a buyer's business. In a reverse e-auction, suppliers submit several electronic bids during a predetermined time frame, typically 30 minutes or less. The cost of the good or service being bought frequently drops during the bidding process, sometimes significantly. A vast pool of possible suppliers, quicker order cycles, lower transaction costs, and competitive buy prices are just a few advantages auctions provide to the purchasing organization. Some buyers are worried that price increases will mask other important performance factors. This article describes the difference between a purchasing organization that has a reverse auction and a purchasing organization that does not use the auction to make procurement decisions. A survey of Vice Presidents and Purchasing Managers was used to collect data for the survey. According to Chi-squared's analysis, there is no difference in recruitment rates between adopters and non-adopters of reverse auctions.

Pavel and Siáková-Beblavá (2013) investigated whether electronic auctions improved the effectiveness of public procurement. The study looks at the factors that affect public procurement effectiveness while using e-auctions for competitive contracting in 15 Slovak cities. Between 2007 and 2009, contracts for information technology and construction were made. There were a total of 186 observations made for the investigation. The theoretical overview of the factors influencing procurement efficiency, including the potential impacts of e-procurement and e-auction, is presented at the beginning of the paper. The results show an indirect correlation between the number of submitted bids and the winning price. The price of the estimated price decreases with each additional bid. The use of e-auctions is associated with a rise in the quantity of bids submitted,

suggesting a decline in the predicted price's average winning price. The use of e-auctions has an indirect effect on the winning price, the report claims. This makes it more transparent than "regular" tenders. It is probably going to undermine bidders' confidence and increase the number of bidders.

(2010) Haruvy and Leszczyc looked into how long an online auction lasts. According to one viewpoint, longer auctions would draw more bidders and bids, leading to higher prices. A shorter auction's duration, on the other hand, can encourage more competitive dynamics or appeal to impatient bidders. We conduct pair-wise comparisons of concurrent auctions that are identical in all respects but duration in order to evaluate these opposing hypotheses. Both eBay and a regional auction website host the auctions. According to the study, longer duration increases the number of bidders and bids in eBay auctions, leading to an 11% increase in final pricing. On the local auction website, where there are considerably fewer auctions and a more stable group of players, the effect is the opposite, and shorter auctions result in prices that are around 20% higher. Both effects are substantial and strong. In eBay auctions, it has been noticed that a larger number of bidders and bids submitted throughout the auction go hand in hand with a higher price in the longer duration auction. According to the study, the quantity of bids placed or the number of bidders participating in an auction at the local site were unaffected by the duration of the auction. On the other hand, the quantity of jump bids has a negative and significant relationship with duration. These leap bids then influence the ultimate prices.

2.5.4 Electronic Payment and Operational Performance

In Rwanda, Harelimana (2018) investigated how the performance of financial institutions was impacted by electronic payment systems. The easiest loan application processes, followed by lax

collateral requirements, affordable financing costs, and low interest rates, were found to have the greatest influence on access to electronic payment. This shows that while utilizing an electronic payment system, respondents considered all aspects of electronic payment to be relevant. Njenga and Ismail (2016) focused on a few supermarket chains in Nairobi County as they examined the effects of electronic point-of-sale technology on supply chain performance in Kenya's retail industry. The study set out to determine how various elements of the electronic point of sale impact supply chain efficiency. Among the listed objective considerations were quick scan systems, cloud-based communication systems, and mobile point of sale. Purposive sampling was used to choose the sample for this study. It has been demonstrated that mobile point-of-sale systems, cloud-based communication systems, and rapid scan systems all have statistically significant effects on supply chain performance.

In 2020, Torki, Rezaei, and Razmi looked on how e-payment technologies affected the financial sector performance of Islamic countries. Iran, Indonesia, Jordan, Kuwait, Malaysia, Egypt, Morocco, Oman, Saudi Arabia, Senegal, Turkey, and the United Arab Emirates were among the nations mentioned. To accomplish this, the study analyzed annual panel data from 2011 to 2017. The results show that all electronic payment indicators, including ATMs, bank cards, point-of-sale devices, and mobile and internet banking, have a positive and considerable impact on the financial sector's performance. While inflation and interest rates have a negative and significant impact on financial sector performance, economic growth and population expansion also have a significant positive impact.

A vast pool of possible suppliers, quicker order cycles, lower transaction costs, and competitive buy prices are just a few advantages auctions provide to the purchasing organization. Some buyers are worried that price increases will mask other important performance factors. This article

describes the difference between a purchasing organization that has a reverse auction and a purchasing organization that does not use the auction to make procurement decisions. A survey of Vice Presidents and Purchasing Managers was used to collect data for the survey. According to Chisquared's analysis, there is no difference in recruitment rates between adopters and non-adopters of reverse auctions.

Electronic retail payment services have proven to be the most effective and efficient services, making it easier for both management and employees to work positively for the entire banking industry. In essence, the introduction of such bulk electronic payment services has greatly improved the prosperity of commercial banks in Kenya. In fact, customers can now perform most transactions during non-business hours, such as withdrawals, and still meet their needs. The Central Bank of Kenya has introduced an electronic retail payment system policy that intensively supports key players in the banking industry by making this type of payment service more effective.

Munyao (2020) used Sarova Hotels as a case study to investigate the impact of electronic payment systems on the revenue development of Kenya's hotel business. The descriptive study design was used to integrate the many parts used in this study. Participants in the survey were 65 people who worked at the Sarova Hotel. Sarova's Resources Office provided a sampling frame. In this study, we used a stratified sampling strategy. A total of 65 people were interviewed for this study. As a result, e-payment technology improves convenience, correlates between e-payment challenges and an organization's profit performance, and partners are reliable and effective, so there are a variety of ways to make payments easier. Collaboration with payment agents or partners has been shown to be essential. Payment systems are used around the world and this partnership will help the hotel

grow. According to the results, Sarova Hotels needs to offer consumers a variety of payment methods such as PayPal, Skrill, iPay, PesaPal and Jambo Pay.

2.6 Conceptual Framework

The conceptual framework is a diagram that is drawn to represent the variables and their indicators and how they relate with each other (Mugenda & Mugenda, 2003). Figure 2.1 is the conceptual framework of the study.

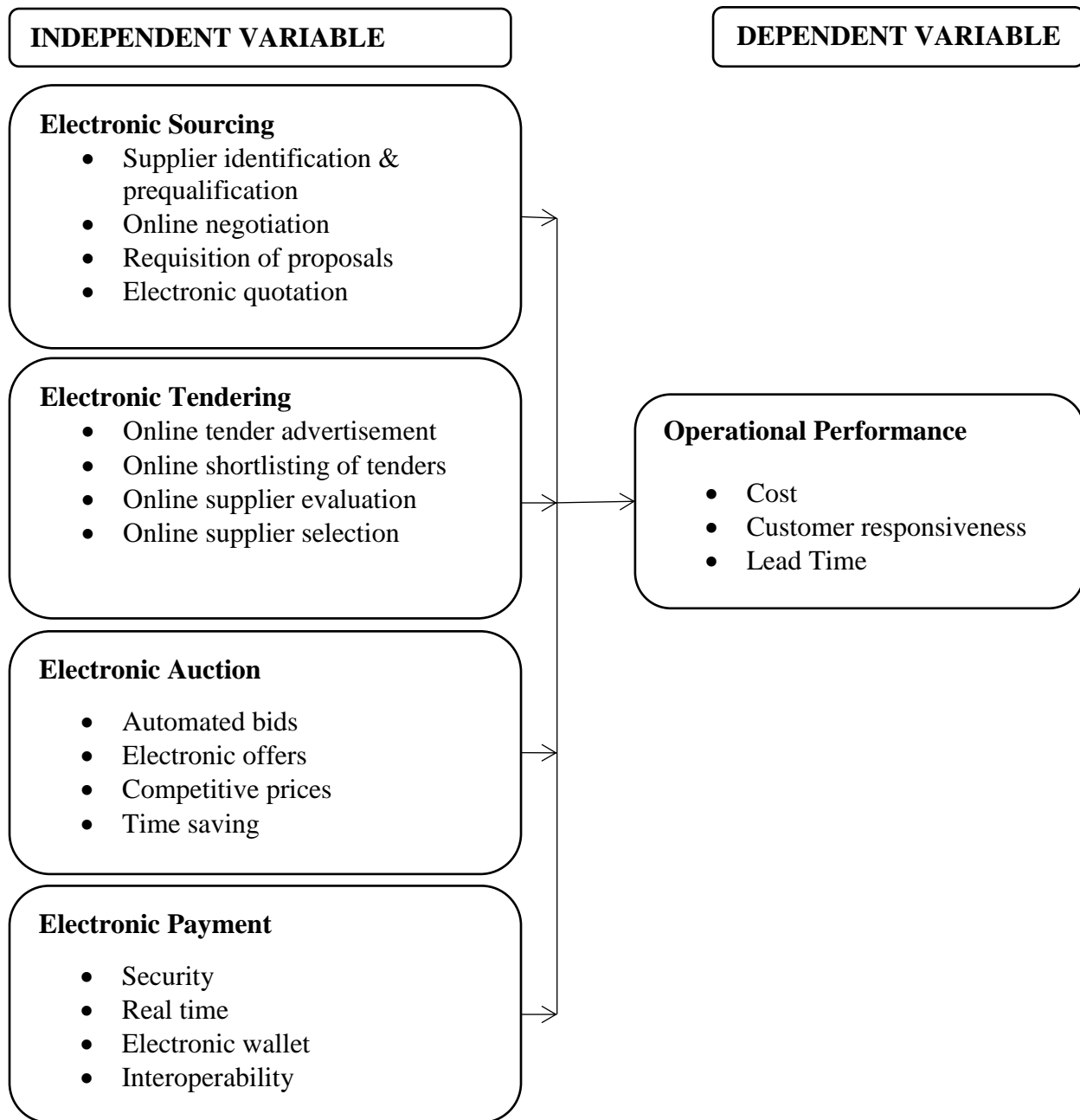


Figure 2.1: Conceptual Framework

2.7 Summary of the Literature Review

The chapter has reviewed literature on resource-based view theory, transaction cost theory and the network theory as theories that will provide anchorage. The past empirical studies are also reviewed on the objective variables. Manthou, Bialas and Stefanou (2016) carried out an inquiry

into the associated barriers and benefits of e-sourcing and e-purchasing with the healthcare sector adopting a case study approach. Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. Mwangi (2020) used a case of the Kenya's Independent Electoral and Boundaries Commission will establish the connection between e-sourcing and successful procurement. Chegugun and Kibet (2018) examined electronic tendering and its relationship to organizational performance with a focus on public health facilities in the county of Uasin Gishu. In 2016, Oteki, Namusonge, Sakwa, and Ngeno carried out research on the e-tendering and supply chain performance of the companies handling sugar processing in Kenya. Using Nairobi County as their example, Gathima and Njoroge (2018) compared e-tendering and organizational performance. Hanák, Marović and Jajac (2018) were interested in bringing out the link between e-reverse auction and competition in the construction sector in Czech. Hartley, Lane and Hong (2004) focused on e-auction and their relevance in supply chain management. Pavel and Sičáková-Beblavá (2013) conducted a study to establish whether e-auctions really improved the efficiency of public procurement. The impact of electronic payment systems on the functioning of the financial sector in a few selected Islamic countries was examined by Torki, Rezaei, and Razmi in 2020. A study on the impact of electronic payment systems on the financial performance of microfinance banks was conducted by Sakanko and David in 2019. Okello (2016) concentrated on the impact of electronic retail payment services on Kenya's commercial banks' financial performance. The precise objectives variables and their operationalization are discussed together with the conceptual framework.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The steps, procedures, and approaches that were used to conduct the research are outlined in this chapter. There are discussions about the research design, target population, sample methodologies, data collection methods and processes, data processing and analysis, significance test, and data validity and reliability.

3.2 Research Design

A descriptive cross-sectional survey was used to perform the study. A survey, according to (Smith, 2015), is technique of acquiring data from a large population. Surveys have three fundamental characteristics. The first feature is that it has structured predefined questions targeting a fraction of the entire population. Second, surveys centers on producing quantitative description of various population aspects. These are often concerned with the links between the predefined aspects of the target population. Third, the survey centered on presenting descriptive statistics of some population variables (Flick, 2015).

3.3 The Target Population

The target audience is often referred to as the universe. All members of a real group of individuals, occasions, or things to which the researcher wishes to apply the findings together are referred to by this word (Smith, 2015). Thirty Kenyan pharmaceutical manufacturing businesses were the subject of the study. There were 120 top managers from the companies who made up the study's population. Two managers of procurement and two managers of finance from each of the 30 organizations participated in the survey. As a result, the observational unit consisted of 120

respondents, while the analytical unit comprised 30 firms. Since the procurement managers are in charge of e-procurement in their company, and the finance managers had crucial information to share regarding operational performance, they will be chosen.

3.4 Sample Frame

A sample frame is a set of persons who can be chosen from the accessible population given the study's selection process and how they are accessed (Neuman, 2016). A device or piece of material from which a sample is obtained is called a sample frame. It is a list of all those who can be sampled from a population, which may include people, homes, or organizations. The list of manufacturing pharmaceutical enterprises in Kenya available at the Pharmacy and Poisson Board served as the study's sampling frame. The sampling frame for this study constituted top managers from 30 pharmaceutical companies in Kenya.

3.5 Sample Technique and Sample Size

Sampling is the process of choosing units from the study's target population so that the elements chosen are representative of the population as a whole (Flick, 2015). Because it is often impossible to interview every person of the target group, sampling is used in research. When faced with time, money, and logistical constraints, Creswell and Creswell (2017) claim that sampling allows a researcher to obtain a representative group to gain knowledge about an entire community. This study used census and thus all the 60 respondents from the manufacturing pharmaceutical firms will be included. Mugenda and Mugenda (2004) argue that a census is ideal for population elements below 200. The use of census allowed the researcher to obtain data from all the firms.

3.6 Data Collection and Procedure

The research used original data. Because they are simple to construct and operate and offer a clear and uncomplicated method of analyzing attitudes, values, beliefs, and motives, surveys were utilized to gather data (Robson, 2002). Open-ended and closed-ended survey questions were employed to elicit detailed responses for qualitative and quantitative analysis. It made use of a Likert scale, with five being a very favorable response and one a negative one. Each of the three parts contained three questions. The adoption of various e-procurement methods was determined by section one, which was related to aim one.

The second section addresses goal two by linking the use of e-procurement systems to pharmaceutical manufacturing enterprises' operational success. The questionnaire was delivered by "emails" to the pharmaceutical company's supply chain manager or the equivalency, if required, in accordance with the covid-19 protocols. Follow-up was done to make sure surveys were completed on time and that those who had trouble completing the questions were helped.

3.7 Pilot Test

A small sample size is utilized in a pilot study to evaluate the accuracy and reliability of the research instrument (Smith, 2015). It is carried out to identify design and equipment flaws and to offer proxies for data that will be used to choose a probability sample. One might choose to include 1% to 10% of the sample size in the pilot study (Kothari & Garg, 2014). In this regard, a pilot study was carried out in Nairobi with six respondents who worked for major, non-manufacturing pharmaceutical distributor firms. In order to prevent bias, the respondents from the pilot survey were not included in the analysis.

3.7.1 Research Instruments Validity

Validity, according to Yin (2017), is concerned with the question of whether or not one is measuring what one believes one is measuring. As a result, validity refers to the measure's meaning, the precision with which it can be measured, and the range of inferences that may be drawn from knowing the score. With the help of the supervisor and other experts, the study was evaluated for content and construct validity. The questionnaire was shared with the supervisor who reviewed the contents in light of the specified constructs in the conceptual framework to determine if there was an alignment.

3.7.2 Research Instruments Reliability

The degree to which an instrument keeps producing consistent results or data is known as reliability (Mohamad et al., 2015). It guarantees that a researcher may rely on data acquired from multiple sources with confidence. Cronbach Alpha Coefficients was used in the study to determine reliability. In this case, the pilot study's fully completed questionnaire was coded, and Cronbach Alpha coefficients were calculated, with 0.7 and above being the cutoff (Fletcher, 2017).

3.7.3 Diagnostic Tests

The following diagnostic tests were conducted before regression analysis as summarized in Table 3.1.

Table 3.1: Diagnostic Tests

Diagnostic Test	Description	Test Specification	Rule of Thumb
Normality test	It will be used to establish whether the data is normally distributed	Histogram	Observe the pattern of the distribution including the peakedness. Skewness and Kurtosis values were also generated

Multicollinearity test	It will be used to establish whether any of the independent variables of the study are highly correlated with each other	Variance of Inflation Factor (VIF)	Values of VIF within range of 1-10 signify absence of multicollinearity
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3.8 Data Analysis and Presentation

In order to transform the acquired data into information that is useful for addressing the study questions, analysis of the data was done. To define the various factors under e-procurement and operational performance, the study employed frequencies and percentages. Both regression analysis and correlation were used to draw precise inferences. The relationship between operational performance and e-procurement was predicted using the regression equation shown below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where;

Y= Supply chain performance

β_0 = Y intercept

β_1 to β_3 = régression coefficients

X_1 = Electronic sourcing

X_2 = Electronic tendering

X_3 =Electronic auction

X_4 = Electronic payment

ϵ = Error term

Tables and figures were used to present the findings of this study.

3.9 Ethical Considerations

The researcher provided secrecy of the data acquired to secure involvement of the respondent in the data collection. The information gathered by the researcher was only for the purpose of the study. It was treated with secrecy, and assurances will be made in regard to this issue, as well as permission from the parties concerned before the data collection process begins. A consent document from the University for Data Collection was also applied by the researcher.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.1 Introduction

The chapter details the findings of analysis as informed by the objectives. The analysis was done using SPSS and presented as detailed in the subsequent sections.

4.2 Response Rate

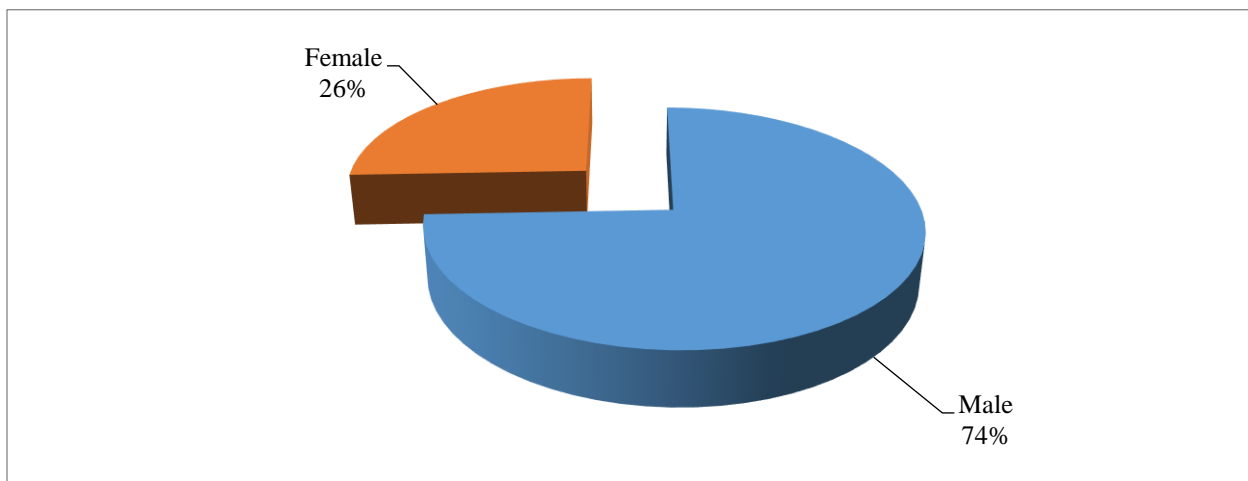
From the 60 respondents that were targeted and administered with the questionnaire, 43 of them fully filled the questionnaire and returned them. This represented a response rate of 71.7%. This was in line with Babbie (2010).

4.3 General Information

The general information of the respondents were determined and presented in the subsequent sections.

4.3.1 Gender of Respondents

Figure 4.1 gives the findings of gender of the respondents.



From Figure 4.1, while 74% of the respondents were male, 26% were female. This means that both gender were involved in the study hence diversity in the views they shared.

4.3.2 Level of Education

Table 4.1 gives the findings on level of education of the respondents.

Table 4.1: Level of Education

	Frequency	Percent
Diploma	16	37.2
First Degree	18	41.9
Masters	9	20.9
Total	43	100.0

Table 4.1 shows that while 41.9% of the respondents had first degrees, 37.2% had diplomas and 20.9% had master's degrees.

4.3.3 Years of Experience

The years of experience of the respondents was determined and summarized as shown in Table 4.2.

Table 4.2: Years of Experience

	Frequency	Percent
Less than 5 years	3	7.0
5-10 years	22	51.2
10-15 years	15	34.9
Over 15 years	3	7.0
Total	43	100.0

Table 4.2 shows that while 51.2% had worked for 5-10 years, 7.0% had worked for less than 5 years and over 15 years respectively. This implies that respondents had worked in their organization for a long period of time thus had accumulated relevant information that was sought.

4.3.4 Years of Operation

Table 4.3 is a summary of the years the studied firms had been operating.

Table 4.3: Years of Operation

	Frequency	Percent
10-15 years	12	27.9
Over 15 years	31	72.1
Total	43	100.0

Table 4.3 indicates that while 72.1% of the firms had operated for over 15 years, 27.9% had operated for 10-15 years. It means that the firms covered in the study had operated for a significant period of time thus suitable to be used case studies.

4.3.5 Adoption of Technologies in Procurement

The findings on whether the studied firms had adopted technology in procurement were determined and summarized in Table 4.4.

Table 4. 4: Adoption of Technologies in Procurement

	Frequency	Percent
Yes	36	83.7
No	4	9.3
Not sure	3	7.0
Total	43	100.0

Table 4.4 indicates that in deed, 83.7% of the studied firms had adopted technology in their procurements processes.

4.4 Descriptive Statistics

This section details the descriptive statistics covering means and standard deviations on the Likert based items.

4.4.1 Electronic Sourcing

Table 4.5 gives the findings on e-sourcing.

Table 4.5: Electronic Sourcing

	Mean	Std. Dev
New suppliers are identified through the internet in this firm	3.76	.718
New suppliers are prequalified through online platforms in this firm	3.67	.808
Negotiations with new suppliers is done through online in this firm	3.65	.841
New suppliers are requested to share through proposals through online platforms in this firm	4.09	.717
Suppliers sent their quotations through online platforms to this firm	3.88	.851
Average	3.81	0.787

Table 4.5 indicate that respondents agreed on the fact that new suppliers were requested to share their proposals through online platforms in this firm (M=4.09), suppliers sent their quotations through online platforms (M=3.88), new suppliers were identified through the internet (M=3.76), new suppliers were prequalified through online platforms (M=3.67) and that negotiations with new suppliers were done through online (M=3.65). On overall, the value of average was given as 3.81, an indication that e-sourcing was practiced in the studied firms. E-sourcing is the process where the next suppliers are identified with the aid of the internet. Through identification of new suppliers, the purchasers are likely to increase their competitiveness. The advantages accruing from e-sourcing include the fact that it streamlines workflow, enhancing the level of transparency in the relationship between buyers and sellers as well as enhancing flexibility in the supply chains.

E-sourcing results into informed negotiations between suppliers and buyers. Kimutai and Ismael (2016) shared some of the benefits accruing with adoption of e-sourcing systems to include reduction in the costs of purchasing, reduction in cycle time and supplier relations.

4.4.2 Electronic Tendering

Table 4.6 is the finding on e-tendering

Table 4.6: Electronic Tendering

	Mean	Std. Dev
Tenders are advertised through the website of this firm	3.90	.683
It saves on cost to advertise tenders through the website of this firm	3.88	.585
Shortlisting of qualified tenders is carried out online in this firm	3.69	1.102
Suppliers are evaluated through online platforms	3.76	.840
Qualified suppliers are selected through online platforms in this firm	3.83	.652
Average	3.81	.772

From Table 4.6, respondents agreed that tenders were advertised through the website (M=3.90), it saved on cost to advertise tenders through the website (M=3.88), qualified suppliers were selected through online platforms (M=3.83), suppliers were evaluated through online platforms (M=3.76) and that Shortlisting of qualified tenders WAS carried out online (M=3.69). On the overall, the value of average is given as 3.81, an indication that e-tendering was highly practiced in the studied firms. E-tendering is a useful tool for lowering bid expenses and removing bureaucratic roadblocks (Omwenga, 2016). At the same time, it allows businesses to better clarify information. E-tendering brings about considerable time saving, since large amount of work is covered at once. E tendering reduces human errors when it comes to preparation of the tender documents that can be so serious to the company profits. E tendering provides a single source of information (Sydorenko, 2017).

4.4.3 Electronic Auction

Table 4.7 gives the findings on e-auction.

Table 4.7: Electronic Auction

	Mean	Std. Dev
E-auction enable suppliers to send automated bids in the firm	3.65	.841
The firm sent offers to suppliers electronically	3.79	.887
The firm sets clearly specified offers to its suppliers during e-auction period	4.02	.706
E-sourcing helps the firm to obtain competitive price for the supplies	3.81	.879
Bids are closed within a short period of time during e-auction in this firm	3.69	.599
Average	3.79	0.782

The findings on Table 4.7 show that the firm sets clearly specified offers to its suppliers during e-auction period (M=4.02), e-sourcing helped the firm to obtain competitive price for the supplies (M=3.81), the firm sent offers to suppliers electronically (M=3.79), bids were closed within a short period of time during e-auction in this firm (M=3.69) and that E-auction enabled suppliers to send automated bids (M=3.65). On overall, the average mean was 3.79, indicating that e-auction was practiced. Electronic auctions are a subclass of online shopping, which is quickly expanding. Ecommerce includes electronic data interchange (EDI), customized on-line products. These may include Microsoft Network, the Internet, and electronic advertisements (Berthon, Pitt & Watson, 1996). Establishing a presence to provide company and product relevant data, expanding customer awareness and giving product/service samples, collecting database information for marketing strategies, handling customer complaints, questions, and suggestions, and selling products and services to retail customers and businesses are all examples of how web sites are used (Pavel & Kubk, 2001).

4.4.4 Electronic Payment

Table 4.8 gives the findings of e-payment.

Table 4.8: Electronic Payment

Statements	Mean	Std. Dev
It is secure for the firm to pay for procured goods electronically	3.81	.932
It is secure for suppliers of this firm to make their payment electronically	3.74	.953
Paying money electronically is real time	4.02	.597
Electronic wallets facilitate electronic payment in this firm	3.62	.817
Suppliers can use different methods to pay for electronically in this firm	3.97	.739
Average	3.83	0.808

Table 4.8 shows that paying money electronically was real time (M=4.02), suppliers could use different methods to pay for electronically (M=3.97), it was secure for the firm to pay for procured goods electronically (M=3.81), it was secure for suppliers to make their payment electronically (M=3.74) and that electronic wallets facilitated electronic payment (M=3.62). On overall, the value of mean is given as 3.83, implying that respondents agreed that e-payment was there in their organization. Automated payment programs have continued to see increasing use in much organization today. They are offered by various vendors such as Visa. Still, they have not seen much change in improving the efficiencies of the organizations using them. Payment has not been incorporated into the majority of organizations' supply chains, leading to inefficient financial operations. This is a strange oddity. Later, will prove that automated payment improve the whole procurement process in the supply chain. The majority of businesses continue to rely on non-automated payment options leading to increased costs to initiate, track, and reconcile. Given the magnitude of these money flows, it's remarkable that most businesses place such a low premium on payment. Payments made through each party's bank should be regarded an essential component of the supply chain. It's tough to keep track of accounts payable (A/P) and accounts receivable (A/R) when every company in the supply chain uses paper-based payment systems.

4.4.5 Operational Performance

Table 4.9 summarizes results on operational performance.

Table 4.9: Operational Performance

Statements	Mean	Std. Dev
E-procurement has reduced the costs incurred in this firm	3.67	.606
The firm quickly respond to the needs of the customers	3.79	.674
It takes little time to replenish inventory items in this firm	3.51	.909
It takes little time to service customer orders in this firm	4.06	.551
Average	3.76	.685

Table 4.9 gives the value of average as 3.76, an indication that respondents agreed on different 5 statements provided under operational performance of their firm. According to Weele (2006), the purchasing process' performance is determined by how effective and efficient the procurement process is. Before deciding to implement processes to improve an organization's performance, it is common for it to assess its performance based on its defined goals and the areas where it needs to improve.

4.5 Diagnostic Tests

The section details the diagnostic tests that were performed.

4.5.1 Multicollinearity Test

VIF values were computed to test for multicollinearity as shown in Tabled 4.10.

Table 4.10: Multicollinearity Test

	Collinearity Statistics	
	Tolerance	VIF
Electronic Sourcing	.376	2.656
Electronic Tendering	.368	2.719
Electronic Auction	.684	1.462
Electronic Payment	.527	1.897

The finding in Table 4.10 gives the VIF values for the variables that happen to fall within a range of 1-10. This is an indication of absence of multicollinearity in the data.

4.5.2 Normality Test

Table 4.11 gives the normality results

Table 4.11: Normality Test

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Electronic Sourcing	43	-.742	.361	.640	.709
Electronic Tendering	43	-.036	.361	.697	.709
Electronic Auction	43	.394	.361	.508	.709
Electronic Payment	43	-.252	.361	.529	.709
Operational Performance	43	.904	.361	1.905	.709

From Table 4.11, all the values of Skewness and Kurtosis happen to fall within the range of +/-3.

This is an indication that the data used in the study was normally distributed.

4.6 Inferential Statistics

The section details inferential statistics covering correlation and regression analysis.

4.6.1 Correlation Matrix

Table 4.12 gives the findings of correlation analysis

Table 4.12: Correlation Matrix

		Operational Performance	Electronic Sourcing	Electronic Tendering	Electronic Auction	Electronic Payment
Operational Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	43				
Electronic Sourcing	Pearson Correlation	.662	1			
	Sig. (2-tailed)	.000				
	N	43	43			
Electronic Tendering	Pearson Correlation	.313	.745**	1		
	Sig. (2-tailed)	.041	.000			
	N	43	43	43		
Electronic Auction	Pearson Correlation	.510	.554	.451	1	
	Sig. (2-tailed)	.000	.000	.002		
	N	43	43	43	43	
Electronic Payment	Pearson Correlation	.486	.597	.668	.407	1
	Sig. (2-tailed)	.001	.000	.000	.007	
	N	43	43	43	43	43

Table 4.12 shows that e-sourcing ($r=.622$) and e-auction ($r=.510$) have a strong and positive relationship with operational performance. These findings are supported by , Manthou, Bialas, and Stefanou (2016) who investigated the associated barriers and benefits of e-sourcing and e-purchasing in the health industry. The research was carried out in Greece. Despite their having an impact, it was discovered that e-Sourcing and e-Purchasing are still in their infancy in the Greeks health care industry. In Rwanda, Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. The study focused on the telecommunication sector with specific focus on MTN Rwanda. More specifically, the study probed to understand the main e-sourcing technologies that had been adopted, areas of application

of e-sourcing and the associated benefits. In total, 265 staff were targeted where 53 were sampled being 20%. Chi-square was useful in highlighting the impact of e-sourcing on supply chain effectiveness.

It was demonstrated that e-sourcing had been used in Rwanda's technology sector with the goal of managing the available supply chain operations. The corporate resource planning tool and spend analysis are two examples of these technologies. Mwangi (2020) provided the connection between e-sourcing and procurement performance using the Independent Electoral and Boundaries Commission case study from Kenya. The study sought a total of 82 respondents, of which 41 were sampled, and utilized a descriptive approach. The findings revealed a strong correlation between e-sourcing and successful procurement. This indicates that implementing e-sourcing will improve the entity's performance in terms of procurement. While using a case of the Kenya Electricity Generating Company Ltd, Kimutai and Ismael (2016) did a study on strategic e-sourcing and its link with supply chain performance. The variables covered by the study include cost reduction, strategic supplier relationship and supply chain risk. The study adopted cross sectional survey design and it was shown that adoption of strategic e-sourcing is an important step and direction towards enhancing supply chain performance of the firm.

While focusing on Nakuru County government, Ochari and Kwasira (2016) sought to bring out the link between e-sourcing and performance of the procurement function. The adopted design was descriptive and 168 people were targeted out of which 118 were sampled through simple random sampling method. It was shown that although the county government has adopted the concept of e-sourcing, its full implementation has not been realized thus its full benefits have been accrued. Hanák, Marović and Jajac (2018) were interested in bringing out the link between e-reverse auction and competition in the Czech construction industries. The study sought to see how

electronic reverse auctions affected the competitive climate in national infrastructure contracts, as well as the incidences of extremely low bids. The use of auctions minimizes the volume of bidders while raising the likelihood of unusually low bids, according to the findings of a quantitative study on Czech building tenders. Hartley, Lane and Hong (2004) focused on e-auction and their relevance in supply chain management.

According to the study's examination of the literature, reverse e-auctions are quickly replacing competitive bidding for supplier selection. Reverse e-auctions use the Internet to allow suppliers to compete for a buyer's business in real time. Suppliers submit several electronic bids over a set time period, usually 30 minutes or fewer, in a reverse e-auction. During the bidding process, the price of the item or service being purchased usually reduces, sometimes substantially. Lower transaction costs, faster order cycle times, a large pool of possible suppliers, and competitive purchasing prices are just a few of the advantages that e-auctions provide to buying organizations. Some purchasers are concerned that placing a premium on pricing would overshadow other critical performance factors. This article describes the difference between a purchasing organization that has a reverse auction and a purchasing organization that does not use the auction to make procurement decisions. A survey of Vice Presidents and Purchasing Managers was used to collect data for the survey. According to Chi-squared's analysis, there is no difference in recruitment rates between adopters and non-adopters of reverse auctions. Pavel and Siáková-Beblavá (2013) conducted research to see if electronic auctions enhanced public procurement efficiency.

The research examines the elements that influence public procurement efficiency in competitive contracting via e-auctions in 15 Slovak cities. Contracts for construction and information technology were issued between 2007 and 2009. The study included a total of 186 observations. The article begins with a theoretical review of the elements that influence procurement efficiency,

including the potential effects of e-procurement and e-auction. The outcome demonstrates an indirect proportion of the relationship between the number of bids filed and the winning price. With each successive bid, the price of the predicted price falls. The usage of e-auctions is linked to an increase in the number of bids filed, implying a fall in the average winning price of the projected price. The implementation of e-auctions has an indirect impact on the winning price, according to the paper. It is more transparent than "normal" tenders for this reason. It is likely to damage bidders' trust and lead to an increase in the number of bidders. Haruvy and Leszczyc (2010) investigated the impact of the length of an online auction. Longer auctions, according to one perspective, would attract more bidders and bids, resulting in higher prices. Shorter auctions, on the other hand, can appeal to impatient bidders, or, conversely, shorter duration might lead to more competitive dynamics. To test these conflicting ideas, we run pair-wise comparisons of simultaneous auctions that are identical in every way but duration. The auctions are held on two platforms: eBay and a local auction website.

According to the study, longer duration increases the number of bidders and bids in eBay auctions, which raises the final price by 11%. On the local auction website, where there are considerably fewer auctions and a more stable group of players, the effect is the opposite, and shorter auctions result in prices that are around 20% higher. Both effects are substantial and strong. It has been noticed in eBay auctions that a higher price in the longer duration auction is accompanied by a larger number of buyers and bids placed in the auction. According to the study, the quantity of bids placed or the number of bidders participating in an auction at the local site were unaffected by the duration of the auction. On the other hand, the quantity of jump bids has a negative and significant relationship with duration. These leap bids in turn influence the pricing at the end.

On the other hand, e-payment ($r=.486$) and e-tendering ($r=.313$) have a moderate and positive relationship. It then follows that e-procurement is positively related with operational performance. The findings are supported by Raventós and Zolezzi (2015) who did a study on e-tendering focusing on pharmaceuticals in Chile. The study covered a period of 2001-2006 and panel regression was used to carry out an analysis of 6888 tenders. The study hypothesized that e-tendering engages the market mechanisms effectively relative to the traditional methods due to reduction in corruption and limited supplier collusion.

It was shown from the findings that e-tendering improves performance with the supply chain of the firm. Osir (2016) focused on e-tendering and procurement performance. The variables used in the study included e-awarding, e-ordering and e-invoicing. The focus of the study was on Kenyan State corporations. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance. Chegugun and Kibet (2018) looked at electronic tendering and its associated link with organizational performance focusing on public health centers in Uasin Gishu County. A total of 5 hospitals were covered by the inquiry with 367 being the study sample. It was noted that through e-tendering, competitiveness in tender bidding has improved among the hospitals.

Kuloba, Kibet and Ayuma (2017) looked at tendering procedures and their link with performance of the firm focusing on Moi Teaching and Referral Hospital in Eldoret. A case study approach was adopted where data was obtained from 384 participants. Institutional and socio-economic theories provided anchorage to the inquiry. It was shown that tendering has a positive link performance of the firm. Oteki, Namusonge, Sakwa and Ngeno (2016) conducted an inquiry on e-tendering and supply chain performance of the firms involved in processing of sugar in Kenya.

In total, 12 firms were covered by the inquiry where 367 respondents were sampled out and included. Mixed methods of research were embraced in this inquiry.

It was shown that e-tendering practices are significantly related with supply chain performance of an entity. Otieno, Aliata and Midida (2021) looked at e-tendering and its link with supply chain performance using Homa Bay County as the case. The adopted design was correlational where 196 respondents were sampled from the 400 participants who had been targeted. It was shown that the link between e-tendering and supply chain performance is direct and significant.

Gathima and Njoroge (2018) related e-tendering and organizational performance using Nairobi County as the case. Innovation diffusion theory and transaction cost theory led the research.

It used both a descriptive and an explanatory research design. 750 responders from the finance, payment, and information technology departments made up the target group. A stratified random selection procedure was used to pick 75 respondents from the three departments for the study. The information was gathered by the distribution of questionnaires to a pre-selected group. The results of the correlation study revealed that e-tendering methods in Nairobi City County Government had a positive and substantial link with performance.

Harelimana (2018) studied the impact of electronic payment systems on financial institutions' performance in Rwanda. Simple loan application procedures were shown to be the most important factor impacting access to electronic payment, followed by minimal collateral requirements, cheap financing expenses, and low interest rates. This demonstrates that respondents judged all factors of electronic payment to be important when using an electronic payment system.

Njenga and Ismail (2016) investigated the impact of electronic point-of-sale technology on supply chain performance in Kenya's retail industry, focusing on a few supermarket chains in Nairobi

County. The goal of the study was to figure out how different components of the electronic point of sale affect supply chain performance. Rapid scan systems, cloud-based communication systems, and mobile point of sale were among the specified objective factors. The sample for this study was chosen using a purposive sampling strategy. Rapid scan systems, cloud-based communication systems, and mobile point-of-sale systems were proven to have statistically significant effects on supply chain performance.

Torki, Rezaei, and Razmi (2020) investigated the impact of e-payment systems on the performance number of Islamic nations financial sector. The countries, included Iran, Indonesia, Jordan, Kuwait, Malaysia, Egypt, Morocco, Oman, Saudi Arabia, Senegal, Turkey, and the UAE. The study used annual panel data from 2011 to 2017 to achieve this goal. The findings reveal that all electronic payment indicators, such as mobile banking, internet banking, bank cards, point-of-sale machines, and ATMs, have a favorable and significant impact on the financial sector's performance. Economic growth and population also have a large beneficial impact on financial sector performance, whereas inflation and interest rates have a negative and considerable impact.

Sakanko and David (2019) investigated the impact of electronic payment systems on microfinance institutions' financial performance in Niger State. The influence of Electronic-Payment Systems on the financial performance of Microfinance Banks and Institutions in Niger State, Nigeria is investigated using a cross-sectional survey research design and descriptive and ordinary least square regressions. The findings of the investigation reveal the availability of e-payment systems in the bank, which have a high level of acceptance due to their ease of use and convenience. Furthermore, the financial success of the microfinance bank is significantly influenced by ATMs, Internet payment options, e-payment cards, and mobile banking platforms. In order to increase user numbers, it was essentially suggested that the security of e-payment platforms be examined

and enhanced. It was also suggested that platform usage fees be decreased and that potential users be made aware of the issue. Okello (2016) investigated how Kenyan commercial banks' financial performance was impacted by electronic retail payment systems. The results showed that by significantly raising productivity and efficiency, the adoption and use of electronic retail payment services has improved the performance of the banking industry.

Electronic retail payment services have brought about a positive effect on the overall operations within the banking industry through making work easier for the management as well as the employees since it has been found to be the most effective and efficient service. Essentially, the adoption of such electronic retail payment services has greatly improved the prosperity of the Kenyan commercial banks. Indeed, the clients can now carry out most of the transactions outside the working hours, for instance, they can make withdrawals and still attend to their needs; the Central Bank of Kenya introduced the electronic retail payment systems guideline, which has intensely assisted the key players within the banking industry by making this type of payment services more effective. Munyaio (2020) used Sarova Hotels as a case study to examine the impact of electronic payment systems on revenue performance in Kenya's hotel business. The descriptive research design was employed to integrate the numerous parts utilised in this study. The study's participants were 65 people who worked at Sarova Hotels. The human resource office of Sarova provided a sampling frame. In this investigation, a stratified sampling strategy was used. A total of 65 people were polled for this study.

The results showed that e-payment technology increases convenience, that there is a connection between electronic payment issues and organizational revenue performance, that working with different payment agents or partners to facilitate payments for the hotel is crucial because these partners have effective and dependable payment systems that are used all over the world, and that

this partnership will aid in the hotel's expansion. The results suggest that Sarova Hotels should provide customers a selection of payment options, such as PayPal, Skrill, iPay, PesaPal, and Jambo Pay.

4.6.2 Regression Results

Table 4.13 is the model summary

Table 4. 13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775 ^a	.601	.559	.92744

According to Table 4.13's R square value of .601, e-procurement accounts for 60.1% of the change in operational performance of the pharmaceutical companies. The results are in line with those of Jayawardhena and Jayaratne (2019), who examined the performance of Sri Lanka's garment industry's supply chain and e-procurement system. The results demonstrated that e-procurement had a favorable effect on the operational effectiveness of the garment sectors. A substantial correlation between supply chain performance and e-procurement practices was found in the study by Faheem and Siddiqui (2019). In Rwanda, Harelimana (2018) focused on public sector entities to link e-procurement and performance indicating a direct link. The study carried out in South Africa by Madzimure, Mafini and Dhurup (2020) looked at e-procurement and supply chain performance focusing on smaller entities where a significant link was noted. Barngetuny and Kimutai (2015) used a case of Elgeyo-Marakwet County to link e-procurement and supply chain management performance documenting a significant link. Waganda (2018) studied the Nairobi-based UN agencies to establish a link between e-procurement and effectiveness. To combine e-procurement and supply chain effectiveness, Aseka (2019) focused on the food manufacturing businesses in Nairobi. Kerubo (2017) evaluated e-procurement and supply chain using a case study approach similar to the Kisii County Government. Oteki (2019), while covering the sugar

processing businesses in Kenya, concentrated on e-procurement methods and supply chain performance. The ANOVA results are displayed in Table 4.14.

Table 4.14: ANOVA Findings

	Sum of Squares	df	Mean Square	F	Sig.
Regression	49.221	4	12.305	14.306	.000 ^b
Residual	32.686	38	.860		
Total	81.907	42			

Table 4.14 gives F calculated value as 14.306 and $p < 0.05$. This means that on overall, the model used in the study was significant. The p-value from Table 4.14 being less than 0.05 implies that e-procurement has significant effect on operational performance. These findings are consistent with Jayawardhena and Jayaratne (2019) who looked at apparel industry e-procurement and supply chain performance in Sri Lanka. The findings showed that e-procurement has a positive impact on the organizational performance of apparel industries. The study by Faheem and Siddiqui (2019) focused on e-procurement practices and their link with supply chain performance where a significant link was noted. Harelimana (2018) concentrated on public sector organizations in Rwanda to establish a direct connection between e-procurement and performance. The research conducted in South Africa by Madzimure, Mafini, and Dhurup (2020) focused on smaller organizations where a substantial correlation was found between e-procurement and supply chain performance. Using the Elgeyo-Marakwet County case study, Barngetuny and Kimutai (2015) found a strong correlation between supply chain management success and e-procurement. Waganda (2018) studied the Nairobi-based United Nations agencies to connect e-procurement and performance. To combine e-procurement and supply chain effectiveness, Aseka (2019) focused on the food manufacturing businesses in Nairobi. Kerubo (2017) evaluated e-procurement and supply chain using a case study approach similar to the Kisii County Government. Oteki (2019), while covering the sugar processing businesses in Kenya, concentrated on e-procurement methods

and supply chain performance. Table 4.15 lists the results of the beta coefficients and their significance.

Table 4.15: Coefficients and Significance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.272	2.713		1.574	.124
Electronic Sourcing	1.026	.216	.792	4.743	.000
Electronic Tendering	.416	.121	.581	3.437	.001
Electronic Auction	.198	.120	.204	1.645	.108
Electronic Payment	.205	.091	.318	2.252	.030

The predicted model from Table 4.15 becomes:

$$Y = 4.272 + 1.026X_1 + .416X_2 + .205X_4 + \varepsilon$$

Where;

Y = Operational performance

X₁ = Electronic sourcing

X₂ = Electronic tendering

X₄ = Electronic payment

Table 4.15 shows that electronic sourcing ($\beta=1.026$, $p<0.05$) has significant effect on operational performance. These findings are supported by Manthou, Bialas, and Stefanou (2016) investigated the associated barriers and benefits of e-sourcing and e-purchasing in the health industry. The research was carried out in Greece. Despite their having an impact, it was discovered that e-Sourcing and e-Purchasing are still in their infancy in the Greeks health care industry. In Rwanda, Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. It was shown that e-sourcing had been adopted in the technological

industry in Rwanda and this was meant to manage the available supply chain operations. These technologies include the enterprise resource planning tool and the spend analysis.

Mwangi (2020) used a case of the Independent Electoral and Boundaries Commission in Kenya to provide the link between e-sourcing and procurement performance. The results showed that e-sourcing and procurement performance are significantly linked with each other. This means that adoption of e-sourcing will enhance the procurement performance of the entity. While using a case of the Kenya Electricity Generating Company Ltd, Kimutai and Ismael (2016) did a study on strategic e-sourcing and its link with supply chain performance. It was shown that adoption of strategic e-sourcing is an important step and direction towards enhancing supply chain performance of the firm. While focusing on Nakuru County government, Ochari and Kwasira (2016) sought to bring out the link between e-sourcing and performance of the procurement function. It was shown that although the county government has adopted the concept of e-sourcing, its full implementation has not been realized thus its full benefits have been accrued.

The study showed that electronic tendering ($\beta=.416$, $p<0.05$) has significant effect on operational performance. This is in line with Raventós and Zolezzi (2015) who did a study on e-tendering focusing on pharmaceuticals in Chile. The study covered a period of 2001-2006 and panel regression was used to carry out an analysis of 6888 tenders. It was shown from the findings that e-tendering improves performance with the supply chain of the firm.

Osir (2016) focused on e-tendering and procurement performance. The variables used in the study included e-awarding, e-ordering and e-invoicing. The focus of the study was on Kenyan State corporations. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance. Chegugun and Kibet (2018) looked at electronic

tendering and its associated link with organizational performance focusing on public health centers in Uasin Gishu County. It was noted that through e-tendering, competitiveness in tender bidding has improved among the hospitals. Kuloba, Kibet and Ayuma (2017) looked at tendering procedures and their link with performance of the firm focusing on Moi Teaching and Referral Hospital in Eldoret. It was shown that tendering has a positive link performance of the firm. Oteki, Namusonge, Sakwa and Ngeno (2016) conducted an inquiry on e-tendering and supply chain performance of the firms involved in processing of sugar in Kenya. It was shown that e-tendering practices are significantly related with supply chain performance of an entity. Using Homa Bay County as a case study, Otieno, Aliata, and Midida (2021) examined e-tendering and its relationship to supply chain performance. It has been established that there is a clear and significant connection between supply chain efficiency and e-tendering. Gathima and Njoroge (2018) used Nairobi County as a case study to associate e-tendering with organizational performance. The findings of the correlation study demonstrated that Nairobi City County Government's e-tendering practices had a significant and favorable relationship with performance.

The study established that electronic payment ($\beta=.205$, $p<0.05$) was significant as far as operational performance of the pharmaceutical firms was concerned. The finding is supported by Harelimana (2018) who studied the impact of electronic payment systems on financial institutions' performance in Rwanda. Simple loan application procedures were shown to be the most important factor impacting access to electronic payment, followed by minimal collateral requirements, cheap financing expenses, and low interest rates. This demonstrates that respondents judged all factors of electronic payment to be important when using an electronic payment system. Njenga and Ismail (2016) investigated the impact of electronic point-of-sale technology on supply chain performance in Kenya's retail industry, focusing on a few supermarket chains in Nairobi

County. Rapid scan systems, cloud-based communication systems, and mobile point of sale were among the specified objective factors. Rapid scan systems, cloud-based communication systems, and mobile point-of-sale systems were proven to have statistically significant effects on supply chain performance.

In 2020, Toriki, Rezaei, and Razmi looked on how e-payment technologies affected the financial sector performance of Islamic countries. The results show that all electronic payment indicators, including ATMs, bank cards, point-of-sale devices, and mobile and internet banking, have a positive and considerable impact on the financial sector's performance. While inflation and interest rates have a negative and sizable impact on financial sector performance, economic growth and population expansion also have a significant positive impact. In Niger State, Sakanko and David (2019) looked into how electronic payment systems affected the financial performance of microfinance institutions.

The findings of the investigation reveal the availability of e-payment systems in the bank, which have a high level of acceptance due to their ease of use and convenience. Furthermore, ATMs, Internet payment choices, e-payment cards, and mobile banking platforms have a substantial positive impact on the microfinance bank's financial success. In essence, it was proposed that the security of e-payment platforms be improved and reviewed in order to attract more users, as well as the lowering of fees connected with platform use and the sensitization of potential users. Okello (2016) examined the impact of electronic retail payment systems on commercial banks' financial performance in Kenya. The findings revealed that the adoption/use of electronic retail payment services has enhanced the banking industry's performance by considerably increasing productivity and efficiency. Electronic retail payment services have brought about a positive effect on the

overall operations within the banking industry through making work easier for the management as well as the employees since it has been found to be the most effective and efficient service.

Essentially, the adoption of such electronic retail payment services has greatly improved the prosperity of the Kenyan commercial banks. Indeed, the clients can now carry out most of the transactions outside the working hours, for instance, they can make withdrawals and still attend to their needs; the Central Bank of Kenya introduced the electronic retail payment systems guideline, which has intensely assisted the key players within the banking industry by making this type of payment services more effective. Munyao (2020) used Sarova Hotels as a case study to examine the impact of electronic payment systems on revenue performance in Kenya's hotel business.

The descriptive research design was employed to integrate the numerous parts utilised in this study. The study's participants were 65 people who worked at Sarova Hotels. The human resource office of Sarova provided a sampling frame. In this investigation, a stratified sampling strategy was used. A total of 65 people were polled for this study. The findings revealed that e-payment technology improves convenience, that there is a link between electronic payment challenges and organizational revenue performance, that partnering with various payment agents or partners to facilitate payments for the hotel is essential because the partners have reliable and effective payment systems that are used all over the world, and that this partnership will help the hotel grow. According to the findings, Sarova Hotels should provide consumers with a variety of payment methods, including PayPal, Skrill, iPay, PesaPal, and Jambo Pay, among others.

On the contrary, electronic auctioning ($p > 0.05$) was not significant. Raventós and Zolezzi (2015) did a study on e-tendering focusing on pharmaceuticals in Chile. The study covered a period of 2001-2006 and panel regression was used to carry out an analysis of 6888 tenders. The study

hypothesized that e-tendering engage the market mechanisms effectively relative to the traditional methods due to reduction in corruption and limited supplier collusion. It was shown from the findings that e-tendering improves performance with the supply chain of the firm. Osir (2016) focused on e-tendering and procurement performance. The variables used in the study included e-awarding, e-ordering and e-invoicing. The focus of the study was on Kenyan State corporations. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance.

Chegugun and Kibet (2018) looked at electronic tendering and its associated link with organizational performance focusing on public health centers in Uasin Gishu County. A total of 5 hospitals were covered by the inquiry with 367 being the study sample. It was noted that through e-tendering, competitiveness in tender bidding has improved among the hospitals. Kuloba, Kibet and Ayuma (2017) looked at tendering procedures and their link with performance of the firm focusing on Moi Teaching and Referral Hospital in Eldoret. A case study approach was adopted where data was obtained from 384 participants. Institutional and socio-economic theories provided anchorage to the inquiry. It was shown that tendering has a positive link performance of the firm.

Oteki, Namusonge, Sakwa and Ngeno (2016) conducted an inquiry on e-tendering and supply chain performance of the firms involved in processing of sugar in Kenya. In total, 12 firms were covered by the inquiry where 367 respondents were sampled out and included. Mixed methods of research were embraced in this inquiry. It was shown that e-tendering practices are significantly related with supply chain performance of an entity. Otieno, Aliata and Midida (2021) looked at e-tendering and its link with supply chain performance using Homa Bay County as the case. The adopted design was correlational where 196 respondents were sampled from the 400 participants

who had been targeted. It was shown that the link between e-tendering and supply chain performance is direct and significant. Gathima and Njoroge (2018) related e-tendering and organizational performance using Nairobi County as the case. Innovation diffusion theory and transaction cost theory led the research. It used both a descriptive and an explanatory research design. 750 responders from the finance, payment, and information technology departments made up the target group. A stratified random selection procedure was used to pick 75 respondents from the three departments for the study. The information was gathered by the distribution of questionnaires to a pre-selected group. The results of the correlation study revealed that e-tendering methods in Nairobi City County Government had a positive and substantial link with performance.

The implications of the findings in Table 4.15 are that e-procurement has significant effect on operational performance. This observation is supported by Jayawardhena and Jayaratne (2019) who looked at apparel industry e-procurement and supply chain performance in Sri Lanka. The findings showed that e-procurement has a positive impact on the organizational performance of apparel industries. The study by Faheem and Siddiqui (2019) focused on e-procurement practices and their link with supply chain performance where a significant link was noted. In Rwanda, Harelimana (2018) focused on public sector entities to link e-procurement and performance indicating a direct link. The study carried out in South Africa by Madzimure, Mafini and Dhurup (2020) looked at e-procurement and supply chain performance focusing on smaller entities where a significant link was noted. Barngetuny and Kimutai (2015) used a case of Elgeyo-Marakwet County to link e-procurement and supply chain management performance documenting a significant link. Waganda (2018) covered the United Nations Agencies based in Nairobi to link e-procurement and performance. Aseka (2019) covered the food manufacturing entities in Nairobi

to link e-procurement and supply chain performance. Kerubo (2017) conducted an assessment of e-procurement and supply chain adopting a case study methodology of Kisii County Government. Oteki (2019) focused on e-procurement practices and supply chain performance although covering the sugar processing entities in Kenya.

4.7 Discussion of the Findings

Correlation results show that e-sourcing ($r=.622$) and e-auction ($r=.510$) have a strong and positive relationship with operational performance. These findings are supported by , Manthou, Bialas, and Stefanou (2016) who investigated the associated barriers and benefits of e-sourcing and e-purchasing in the health industry. The research was carried out in Greece. Despite their having an impact, it was discovered that e-Sourcing and e-Purchasing are still in their infancy in the Greeks health care industry.

In Rwanda, Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. The study focused on the telecommunication sector with specific focus on MTN Rwanda. More specifically, the study probed to understand the main e-sourcing technologies that had been adopted, areas of application of e-sourcing and the associated benefits. In total, 265 staff were targeted where 53 were sampled being 20%. Chi-square helped in bringing out the effect linked with e-sourcing on supply chain performance. It was shown that e-sourcing had been adopted in the technological industry in Rwanda and this was meant to manage the available supply chain operations. These technologies include the enterprise resource planning tool and the spend analysis. Mwangi (2020) used a case of the Independent Electoral and Boundaries Commission in Kenya to provide the link between e-sourcing and procurement performance. The adopted design was descriptive and a total of 82 respondents were targeted by

the study out of which 41 were sampled. The results showed that e-sourcing and procurement performance are significantly linked with each other.

This means that adoption of e-sourcing will enhance the procurement performance of the entity. While using a case of the Kenya Electricity Generating Company Ltd, Kimutai and Ismael (2016) did a study on strategic e-sourcing and its link with supply chain performance. The variables covered by the study include cost reduction, strategic supplier relationship and supply chain risk. The study adopted cross sectional survey design and it was shown that adoption of strategic e-sourcing is an important step and direction towards enhancing supply chain performance of the firm. While focusing on Nakuru County government, Ochari and Kwasira (2016) sought to bring out the link between e-sourcing and performance of the procurement function. The adopted design was descriptive and 168 people were targeted out of which 118 were sampled through simple random sampling method. It was shown that although the county government has adopted the concept of e-sourcing, its full implementation has not been realized thus its full benefits have been accrued. Hanák, Marović and Jajac (2018) were interested in bringing out the link between e-reverse auction and competition in the Czech construction industries. The study sought to see how electronic reverse auctions affected the competitive climate in national infrastructure contracts, as well as the incidences of extremely low bids.

The use of auctions minimizes the volume of bidders while raising the likelihood of unusually low bids, according to the findings of a quantitative study on Czech building tenders. Hartley, Lane and Hong (2004) focused on e-auction and their relevance in supply chain management. According to the study's examination of the literature, reverse e-auctions are quickly replacing competitive bidding for supplier selection. Reverse e-auctions use the Internet to allow suppliers to compete

for a buyer's business in real time. Suppliers submit several electronic bids over a set time period, usually 30 minutes or fewer, in a reverse e-auction.

During the bidding process, the price of the item or service being purchased usually reduces, sometimes substantially. Lower transaction costs, faster order cycle times, a large pool of possible suppliers, and competitive purchasing prices are just a few of the advantages that e-auctions provide to buying organizations. Some purchasers are concerned that placing a premium on pricing would overshadow other critical performance factors. This article examines the differences between buying organizations that have implemented reverse e-auctions and those that have not used e-auctions for sourcing decisions. A survey of vice presidents and directors of buying was used to collect data for the study. According to a Chi-squared analysis, there are no differences in the amount of adoption between reverse e-auction adopters and non-adopters. Pavel and Siáková-Beblová (2013) conducted research to see if electronic auctions enhanced public procurement efficiency.

The research examines the elements that influence public procurement efficiency in competitive contracting via e-auctions in 15 Slovak cities. Contracts for construction and information technology were issued between 2007 and 2009. The study included a total of 186 observations. The article begins with a theoretical review of the elements that influence procurement efficiency, including the potential effects of e-procurement and e-auction.

The outcome demonstrates an indirect proportion of the relationship between the number of bids filed and the winning price. With each successive bid, the price of the predicted price falls. The usage of e-auctions is linked to an increase in the number of bids filed, implying a fall in the average winning price of the projected price. The implementation of e-auctions has an indirect

impact on the winning price, according to the paper. It is more transparent than "normal" tenders for this reason. It is likely to damage bidders' trust and lead to an increase in the number of bidders. Haruvy and Leszczyc (2010) investigated the impact of the length of an online auction. Longer auctions, according to one perspective, would attract more bidders and bids, resulting in higher prices. Shorter auctions, on the other hand, can appeal to impatient bidders, or, conversely, shorter duration might lead to more competitive dynamics.

To test these conflicting ideas, we run pair-wise comparisons of simultaneous auctions that are identical in every way but duration. The auctions are held on two platforms: eBay and a local auction website. Longer duration improves the number of bidders and bids in eBay auctions, resulting in an 11 percent increase in final pricing, according to the study. On the local auction website, where there are considerably fewer auctions and a more stable group of players, the effect is the opposite, and shorter auctions result in prices that are around 20% higher. Both effects are substantial and strong. In eBay auctions, it has been noticed that a larger number of bidders and bids submitted throughout the auction go hand in hand with a higher price in the longer duration auction. According to the study, the quantity of bids placed or the number of bidders participating in an auction at the local site were unaffected by the duration of the auction. On the other hand, the quantity of jump bids has a negative and significant relationship with duration. These leap bids then influence the ultimate prices.

On the other hand, e-payment ($r=.486$) and e-tendering ($r=.313$) have a moderate and positive relationship. It then follows that e-procurement is positively related with operational performance. The findings are supported by Raventós and Zolezzi (2015) who did a study on e-tendering focusing on pharmaceuticals in Chile. The study covered a period of 2001-2006 and panel regression was used to carry out an analysis of 6888 tenders. The study hypothesized that e-

tendering engage the market mechanisms effectively relative to the traditional methods due to reduction in corruption and limited supplier collusion. It was shown from the findings that e-tendering improves performance with the supply chain of the firm. Osir (2016) focused on e-tendering and procurement performance.

The variables used in the study included e-awarding, e-ordering and e-invoicing. The focus of the study was on Kenyan State corporations. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance. Chegugun and Kibet (2018) looked at electronic tendering and its associated link with organizational performance focusing on public health centers in Uasin Gishu County. A total of 5 hospitals were covered by the inquiry with 367 being the study sample. It was noted that through e-tendering, competitiveness in tender bidding has improved among the hospitals. Kuloba, Kibet and Ayuma (2017) looked at tendering procedures and their link with performance of the firm focusing on Moi Teaching and Referral Hospital in Eldoret.

A case study approach was adopted where data was obtained from 384 participants. Institutional and socio-economic theories provided anchorage to the inquiry. It was shown that tendering has a positive link performance of the firm. Oteki, Namusonge, Sakwa and Ngeno (2016) conducted an inquiry on e-tendering and supply chain performance of the firms involved in processing of sugar in Kenya. In total, 12 firms were covered by the inquiry where 367 respondents were sampled out and included. Mixed methods of research were embraced in this inquiry. It was shown that e-tendering practices are significantly related with supply chain performance of an entity. Otieno, Aliata and Midida (2021) looked at e-tendering and its link with supply chain performance using Homa Bay County as the case. The adopted design was correlational where 196 respondents were sampled from the 400 participants who had been targeted. It was shown that the link between e-

tendering and supply chain performance is direct and significant. Gathima and Njoroge (2018) related e-tendering and organizational performance using Nairobi County as the case. Innovation diffusion theory and transaction cost theory led the research. It used both a descriptive and an explanatory research design. 750 responders from the finance, payment, and information technology departments made up the target group. A stratified random selection procedure was used to pick 75 respondents from the three departments for the study. The information was gathered by the distribution of questionnaires to a pre-selected group. The results of the correlation study revealed that e-tendering methods in Nairobi City County Government had a positive and substantial link with performance.

Harelimana (2018) studied the impact of electronic payment systems on financial institutions' performance in Rwanda. Simple loan application procedures were shown to be the most important factor impacting access to electronic payment, followed by minimal collateral requirements, cheap financing expenses, and low interest rates. This demonstrates that respondents judged all factors of electronic payment to be important when using an electronic payment system. Njenga and Ismail (2016) investigated the impact of electronic point-of-sale technology on supply chain performance in Kenya's retail industry, focusing on a few supermarket chains in Nairobi County.

The goal of the study was to figure out how different components of the electronic point of sale affect supply chain performance. Rapid scan systems, cloud-based communication systems, and mobile point of sale were among the specified objective factors. The sample for this study was chosen using a purposive sampling strategy. Rapid scan systems, cloud-based communication systems, and mobile point-of-sale systems were proven to have statistically significant effects on

supply chain performance. Torki, Rezaei, and Razmi (2020) investigated the impact of e-payment systems on the performance number of Islamic nations financial sector.

The countries, included Iran, Indonesia, Jordan, Kuwait, Malaysia, Egypt, Morocco, Oman, Saudi Arabia, Senegal, Turkey, and the UAE. The study used annual panel data from 2011 to 2017 to achieve this goal. The findings reveal that all electronic payment indicators, such as mobile banking, internet banking, bank cards, point-of-sale machines, and ATMs, have a favorable and significant impact on the financial sector's performance. Economic growth and population also have a large beneficial impact on financial sector performance, whereas inflation and interest rates have a negative and considerable impact. Sakanko and David (2019) investigated the impact of electronic payment systems on microfinance institutions' financial performance in Niger State.

The influence of Electronic-Payment Systems on the financial performance of Microfinance Banks and Institutions in Niger State, Nigeria is investigated using a cross-sectional survey research design and descriptive and ordinary least square regressions. The findings of the investigation reveal the availability of e-payment systems in the bank, which have a high level of acceptance due to their ease of use and convenience. Furthermore, ATMs, Internet payment choices, e-payment cards, and mobile banking platforms have a substantial positive impact on the microfinance bank's financial success.

In essence, it was proposed that the security of e-payment platforms be improved and reviewed in order to attract more users, as well as the lowering of fees connected with platform use and the sensitization of potential users. Okello (2016) examined the impact of electronic retail payment systems on commercial banks' financial performance in Kenya. The findings revealed that the

adoption/use of electronic retail payment services has enhanced the banking industry's performance by considerably increasing productivity and efficiency.

Electronic retail payment services have brought about a positive effect on the overall operations within the banking industry through making work easier for the management as well as the employees since it has been found to be the most effective and efficient service. Essentially, the adoption of such electronic retail payment services has greatly improved the prosperity of the Kenyan commercial banks. Indeed, the clients can now carry out most of the transactions outside the working hours, for instance, they can make withdrawals and still attend to their needs; the Central Bank of Kenya introduced the electronic retail payment systems guideline, which has intensely assisted the key players within the banking industry by making this type of payment services more effective.

Munyao (2020) used Sarova Hotels as a case study to examine the impact of electronic payment systems on revenue performance in Kenya's hotel business. The descriptive research design was employed to integrate the numerous parts utilised in this study. The study's participants were 65 people who worked at Sarova Hotels. The human resource office of Sarova provided a sampling frame. In this investigation, a stratified sampling strategy was used. A total of 65 people were polled for this study. The findings revealed that e-payment technology improves convenience, that there is a link between electronic payment challenges and organizational revenue performance, that partnering with various payment agents or partners to facilitate payments for the hotel is essential because the partners have reliable and effective payment systems that are used all over the world, and that this partnership will help the hotel grow. According to the findings, Sarova Hotels should provide consumers with a variety of payment methods, including PayPal, Skrill, iPay, PesaPal, and Jambo Pay, among others.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter is set out to detail the findings of the analyzed data with conclusion and recommendations. The areas for further research are also pointed out.

5.2 Summary of the Findings

5.2.1 Electronic Sourcing and Operational Performance

Respondents agreed on the fact that new suppliers were requested to share their proposals through online platforms in this firm (M=4.09), suppliers sent their quotations through online platforms (M=3.88), new suppliers were identified through the internet (M=3.76), new suppliers were prequalified through online platforms (M=3.67) and that negotiations with new suppliers were done through online (M=3.65). On overall, the value of average was given as 3.81, an indication that e-sourcing was practiced in the studied firms. Correlation results were that e-sourcing has a strong and positive relationship with operational performance. From regression analysis, electronic sourcing ($\beta=1.026$, $p<0.05$) was significant as far as operational performance of the pharmaceutical firms was concerned. These findings are supported by Using a case study method, Manthou, Bialas, and Stefanou (2016) investigated the associated barriers and benefits of e-sourcing and e-purchasing in the health industry. The research was carried out in Greece. Despite their having an impact, it was discovered that e-Sourcing and e-Purchasing are still in their infancy in the Greeks health care industry. Tuyisabe and Mulyungi (2018) conducted a study on adoption of e-sourcing and its link with efficiency in the supply chain. It was shown that e-sourcing had been adopted in the technological industry in Rwanda and this was meant to manage the available supply chain operations. These technologies include the enterprise resource planning tool and the

spend analysis. Mwangi (2020) used a case of the Independent Electoral and Boundaries Commission in Kenya to provide the link between e-sourcing and procurement performance. The results showed that e-sourcing and procurement performance are significantly linked with each other. This means that adoption of e-sourcing will enhance the procurement performance of the entity. While using a case of the Kenya Electricity Generating Company Ltd, Kimutai and Ismael (2016) did a study on strategic e-sourcing and its link with supply chain performance. It was shown that adoption of strategic e-sourcing is an important step and direction towards enhancing supply chain performance of the firm. While focusing on Nakuru County government, Ochari and Kwasira (2016) sought to bring out the link between e-sourcing and performance of the procurement function. It was shown that although the county government has adopted the concept of e-sourcing, its full implementation has not been realized thus its full benefits have been accrued.

5.2.2 Electronic Tendering and Operational Performance

Respondents agreed that tenders were advertised through the website ($M=3.90$), it saved on cost to advertise tenders through the website ($M=3.88$), qualified suppliers were selected through online platforms ($M=3.83$), suppliers were evaluated through online platforms ($M=3.76$) and that Shortlisting of qualified tenders WAs carried out online ($M=3.69$). On the overall, the value of average is given as 3.81, an indication that e-tendering was highly practiced in the studied firms. Correlation analysis showed e-tendering ($r=.313$) has a moderate and positive relationship. Regression analysis showed that electronic tendering ($\beta=.416$, $p<0.05$) was significant as far as operational performance of the pharmaceutical firms was concerned. The findings are supported by Raventós and Zolezzi (2015) who did a study on e-tendering focusing on pharmaceuticals in Chile. It was shown from the findings that e-tendering improves performance with the supply chain

of the firm. Osir (2016) focused on e-tendering and procurement performance. The study noted that e-tendering has been adopted by State Corporations so as to improve on their procurement performance. Chegugun and Kibet (2018) looked at electronic tendering and its associated link with organizational performance focusing on public health centers in Uasin Gishu County.. It was noted that through e-tendering, competitiveness in tender bidding has improved among the hospitals. Kuloba, Kibet and Ayuma (2017) looked at tendering procedures and their link with performance of the firm focusing on Moi Teaching and Referral Hospital in Eldoret. It was shown that tendering has a positive link performance of the firm. Oteki, Namusonge, Sakwa and Ngeno (2016) conducted an inquiry on e-tendering and supply chain performance of the firms involved in processing of sugar in Kenya. . It was shown that e-tendering practices are significantly related with supply chain performance of an entity. Otieno, Aliata and Midida (2021) looked at e-tendering and its link with supply chain performance using Homa Bay County as the case. It was shown that the link between e-tendering and supply chain performance is direct and significant. Gathima and Njoroge (2018) related e-tendering and organizational performance using Nairobi County as the case. The results of the correlation study revealed that e-tendering methods in Nairobi City County Government had a positive and substantial link with performance.

5.2.3 Electronic Payment and Operational Performance

The study established that paying money electronically was real time (M=4.02), suppliers could use different methods to pay for electronically (M=3.97), it was secure for the firm to pay for procured goods electronically (M=3.81), it was secure for suppliers to make their payment electronically (M=3.74) and that electronic wallets facilitated electronic payment (M=3.62). On overall, the value of mean is given as 3.83, implying that respondents agreed that e-payment was there in their organization. From correlation analysis, e-payment ($r=0.486$) has a moderate and

positive relationship. It then follow that e-procurement is positively related with operational performance. Regression showed that electronic payment ($\beta=.205$, $p<0.05$) was significant as far as operational performance of the pharmaceutical firms was concerned. These findings are consistent with Harelimana (2018) who studied the impact of electronic payment systems on financial institutions' performance in Rwanda. Simple loan application procedures were shown to be the most important factor impacting access to electronic payment, followed by minimal collateral requirements, cheap financing expenses, and low interest rates. This demonstrates that respondents judged all factors of electronic payment to be important when using an electronic payment system. Njenga and Ismail (2016) investigated the impact of electronic point-of-sale technology on supply chain performance in Kenya's retail industry, focusing on a few supermarket chains in Nairobi County. Rapid scan systems, cloud-based communication systems, and mobile point-of-sale systems were proven to have statistically significant effects on supply chain performance. Torki, Rezaei, and Razmi (2020) investigated the impact of e-payment systems on the performance number of Islamic nations financial sector. The findings reveal that all electronic payment indicators, such as mobile banking, internet banking, bank cards, point-of-sale machines, and ATMs, have a favorable and significant impact on the financial sector's performance. Sakanko and David (2019) investigated the impact of electronic payment systems on microfinance institutions' financial performance in Niger State. The findings of the investigation reveal the availability of e-payment systems in the bank, which have a high level of acceptance due to their ease of use and convenience. Furthermore, ATMs, Internet payment choices, e-payment cards, and mobile banking platforms have a substantial positive impact on the microfinance bank's financial success. Okello (2016) examined the impact of electronic retail payment systems on commercial banks' financial performance in Kenya. The findings revealed that the adoption/use of electronic

retail payment services has enhanced the banking industry's performance by considerably increasing productivity and efficiency. Munyao (2020) used Sarova Hotels as a case study to examine the impact of electronic payment systems on revenue performance in Kenya's hotel business. The findings revealed that e-payment technology improves convenience, that there is a link between electronic payment challenges and organizational revenue performance, that partnering with various payment agents or partners to facilitate payments for the hotel is essential because the partners have reliable and effective payment systems that are used all over the world, and that this partnership will help the hotel grow.

5.3 Conclusion

E-sourcing has a strong and positive relationship with operational performance. From regression analysis, electronic sourcing was significant as far as operational performance of the pharmaceutical firms was concerned. Respondents agreed e-sourcing was practiced in the studied firms.

E-tendering has a moderate and positive relationship with operational performance. Electronic tendering was significant as far as operational performance of the pharmaceutical firms was concerned. Respondents agreed that e-tendering was highly practiced in the studied firms.

E-payment has a moderate and positive relationship. Electronic payment was significant as far as operational performance of the pharmaceutical firms was concerned. Respondents agreed that e-payment was there in their organization.

5.4 Recommendations of the Study

The procurement managers working in the pharmaceutical manufacturing firms in Kenya should enhance the existing e-sourcing platforms to improve on operational performance.

An improvement on e-tendering among pharmaceutical manufacturing firms in Kenya is also required in order to enhance operational performance.

The procurement managers of the pharmaceutical manufacturing firms in Kenya should partner with electronic payment platforms like Pesapal to support e-payment.

5.5 Suggestions for Further Research

Future studies should be conducted focusing on other firms aside from pharmaceutical manufacturing firms. The focus of future studies should be on other variables like competitive advantage or supply chain performance aside from operational performance. This will give room for comparison of the findings.

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APPENDICES

Appendix I: Questionnaire

SECTION A: General Information

1. Kindly indicate your gender?

Male

Female

2. What is your highest level of education?

Certificate

Diploma

First Degree

Masters

Other.....

3. How many years have you worked with this firm?

Less than 5 years

5-10 years

10-15 years

Over 15 years

4. Kindly indicate the number of years your firm has been in operation

Less than 5 years

5-10 years

10-15 years

Over 15 years

5. Has your firm adopted technologies in its procurement department?

Yes

No

Not sure

SECTION B: ELECTRONIC PROCUREMENT

Electronic Sourcing (Provide responses by ticking appropriate answers)

6. To what extent do you agree with the following statements on e-sourcing, where: 1= Strongly Disagree (SD) 2=Disagree (D) 3= Neutral (N) 4= Agree (A) 5= Strongly Agree (SA)

	1	2	3	4	5
New suppliers are identified through the internet in this firm					
New suppliers are prequalified through online platforms in this firm					
Negotiations with new suppliers is done through online in this firm					
New suppliers are requested to share through proposals through online platforms in this firm					
Suppliers sent their quotations through online platforms to this firm					

Electronic Tendering (Provide responses by ticking appropriate answers)

7. To what extent do you agree with the following statements on e-tendering Where: 1= Strongly Disagree (SD) 2=Disagree (D) 3= Neutral (N) 4= Agree (A) 5= Strongly Agree (SA)

	1	2	3	4	5
Tenders are advertised through the website of this firm					
It saves on cost to advertise tenders through the website of this firm					
Shortlisting of qualified tenders is carried out online in this firm					
Suppliers are evaluated through online platforms					
Qualified suppliers are selected through online platforms in this firm					

Electronic Auction (Provide responses by ticking appropriate answers)

8. To what extent do you agree with the following statements on e-auction where: 1= Strongly Disagree (SD) 2=Disagree (D) 3= Neutral (N) 4= Agree (A) 5= Strongly Agree (SA)

	1	2	3	4	5
E-auction enable suppliers to send automated bids in the firm					
The firm sent offers to suppliers electronically					
The firm sets clearly specified offers to its suppliers during e-auction period					
E-sourcing helps the firm to obtain competitive price for the supplies					

Bids are closed within a short period of time during e-auction in this firm					
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Electronic Payment (Provide responses by ticking appropriate answers)

9. To what extent do you agree with the following statements on e-payment where: 1= Strongly Disagree (SD) 2=Disagree (D) 3= Neutral (N) 4= Agree (A) 5= Strongly Agree (SA)

Statements	1	2	3	4	5
It is secure for the firm to pay for procured goods electronically					
It is secure for suppliers of this firm to make their payment electronically					
Paying money electronically is real time					
Electronic wallets facilitate electronic payment in this firm					
Suppliers can use different methods to pay for electronically in this firm					

Operational Performance (Provide responses by ticking appropriate answers)

10. To what extent do you agree with the following statements on operational performance of your firm, where: 1= Strongly Disagree (SD) 2=Disagree (D) 3= Neutral (N) 4= Agree (A) 5= Strongly Agree (SA)

Statements	1	2	3	4	5
E-procurement has reduced the costs incurred in this firm					
The firm quickly respond to the needs of the customers					
It takes little time to replenish inventory items in this firm					
It takes little time to service customer orders in this firm					

Thank you

Appendix II: List of Manufacturing Pharmaceutical Firms in Kenya

S/No.	Name	Location
1	Alpha Medical Manufacturers	Nairobi
2	Bayer East Africa Limited	Nairobi
3	Beta Healthcare International	Nairobi
4	Biodeal Laboratories Ltd	Nairobi
5	Biopharma Limited	Nairobi
6	Cosmos Limited	Nairobi
7	Dawa Pharmaceuticals Limited	Nairobi
8	Elys Chemical Industries Ltd	Nairobi
9	Gesto Pharmaceuticals limited	Nairobi
10	Glaxo SmithKline	Nairobi
11	Ivee Aqua EPZ Limited	Athi River
12	Laboratory & Allied limited	Nairobi
13	Manhar Brothers (Kenya) Ltd	Nairobi
14	Medivet Products limited	Nairobi
15	Novelty Manufacturers Ltd	Nairobi
16	Osschemie (K) Ltd	Nairobi
17	Regal Pharmaceutical Ltd	Nairobi
18	Skylight Pharmaceutical Ltd	Nairobi
19	Universal Pharmaceutical Limited	Kiambu
20	Aventis Pasteur SA East Africa	Nairobi
21	Manhar Brothers (Kenya) Ltd-	Nairobi
22	Pharmaceutical Products Ltd	Nairobi
23	Philips Pharmaceuticals Ltd	Nairobi
24	Pharmaceutical Manufacturing Company Ltd	Nairobi
25	Didy Pharmaceutical	Nairobi
26	Diversey Lever	Nairobi
27	Eli-Lilly (Suisse) SA	Nairobi
28	High Chem East Africa	Nairobi
29	Mac's Pharmaceutical Ltd	Nairobi
30	Medical Centre	Nairobi

Source: Pharmacy & Poisson Board (2021)