



## **E-PROCUREMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE AT KENYA MEDICAL SUPPLIES AUTHORITY**

**<sup>1</sup>Nakhumicha S. Wafula, <sup>2</sup>Dr. Samson Nyang'au Paul, <sup>3</sup>Dr. Ndeto Charles**

<sup>1</sup> Master of Science Degree in Procurement and Logistics of Jomo Kenyatta University of  
Agriculture and Technology

<sup>2,3</sup> Lecturers, Jomo Kenyatta University of Agriculture and Technology

### **ABSTRACT**

The main focus of the study was to examine the effect of electronic procurement practices on supply chain performance at Kenya Medical Supplies Authority. Specifically, the study sought to establish the effect of electronic purchase on supply chain performance at Kenya Medical Supplies Authority and to assess the effect of electronic payment on supply chain performance at Kenya Medical Supplies Authority. This study was guided by: Technology Acceptance Model and Diffusion of Innovations Theory. This study used descriptive research design to collect both qualitative and quantitative data. The target population consisted of 175 management-level employees at the Kenya Medical Supplies Authority (KEMSA). The unit of observation was specifically 175 management employees across various departments who are directly involved in or oversee procurement and supply chain activities. Due to the small size of target population, census sampling technique was adopted. Therefore, the sample size for the study was 175 respondents. This study used primary data collected using a structured questionnaire. Quantitative data collected was analyzed using descriptive statistics techniques such as frequencies, percentages, means and standard deviations. To test the relationship between study variable, inferential statistics were used. It included pearson R correlation and multiple regression models. Presentation of the results were done in tables and figures. Regression analysis showed that among the predictors, electronic purchasing had the strongest effect ( $\beta = 0.262$ ), followed by electronic payment ( $\beta = 0.217$ ). These results indicate that improvements in each e-procurement component directly enhance supply chain efficiency, reduce cycle times, and improve supplier engagement. The study concludes that electronic procurement significantly contributes to improving KEMSA's supply chain performance by streamlining procurement processes, enhancing transparency, and increasing operational efficiency. Electronic purchasing emerged as the most influential factor, highlighting its role in ensuring accuracy, timely procurement, and better resource utilization. The study recommends that KEMSA prioritize further investment in electronic purchasing systems and integrate real-time inventory management to enhance accuracy and responsiveness. Strengthening electronic payment platforms is also recommended to improve financial accountability and maintain strong supplier relationships.

**Key Words:** Electronic Procurement Practices, Electronic Purchase, Supply Chain Performance, Electronic Payment, Kenya Medical Supplies Authority

## **Background of the Study**

The rapid advancement of digital technologies has brought transformative changes to supply chain management across various sectors, including the healthcare industry (Kumar, 2020). Health organizations are increasingly adopting e-procurement practices to enhance supply chain performance. These electronic systems have the potential to improve efficiency, transparency, and cost-effectiveness in procurement processes. E-procurement, defined as the electronic acquisition of goods and services, has emerged as a key driver in optimizing supply chain operations, addressing many challenges associated with traditional procurement methods (Demberere, Waithaka, & Matunga, 2023).

In national health supply chains, where timely procurement and distribution of medical supplies are critical to public health outcomes, the adoption of e-procurement practices is becoming a strategic imperative. For instance, in Kenya, the Kenya Medical Supplies Authority (KEMSA) has begun adopting e-procurement systems to address issues like stockouts, overstocking, and inefficient resource allocation, which have long plagued the health sector (Mwangi & Nduta, 2020). E-procurement practices, including e-purchasing, and e-invoicing, are designed to streamline these processes, thereby enhancing the overall performance of the supply chain (Muthoni & Kariuki, 2021).

Studies indicate that implementing e-procurement can significantly improve supply chain performance by streamlining procurement processes, reducing operational costs, and enhancing coordination among stakeholders (Nyaga & Karanja, 2021; Otieno, 2020). However, despite these apparent benefits, empirical evidence on the impact of e-procurement on supply chain performance, particularly within national health organizations in developing countries, remains limited (Wanyama, 2019). This gap in the literature highlights the need for more in-depth studies to explore the relationship between e-procurement practices and supply chain performance in such contexts.

The shift toward e-procurement in health supply chains is largely driven by the necessity to overcome the inherent challenges of traditional procurement systems, such as delays, inefficiencies in supplier management, and issues related to transparency and accountability (Ochieng & Mungai, 2022). E-procurement systems have the potential to address these challenges effectively and are increasingly seen as crucial in improving the overall efficiency and performance of health supply chains (Karani & Murithi, 2021).

The success of e-procurement in improving supply chain performance, however, is dependent on several factors. These include the level of system integration, the competence of users, and the quality of supplier relationships (Karani & Murithi, 2021). Thus, this study aimed to investigate the influence of e-procurement practices on supply chain performance, with a particular focus on national health supply chain organizations like KEMSA in Kenya.

## **Statement of the Problem**

Kenya's healthcare sector faces critical challenges in supply chain management, particularly in the procurement and distribution of essential medical supplies. Inefficiencies in procurement processes have led to frequent stockouts, overstocking, and delayed deliveries, severely compromising the quality of healthcare services. According to the Kenya Medical Supplies Authority (KEMSA), approximately 30% of public health facilities in Kenya regularly experience stockouts of essential medicines, directly affecting patient care and contributing to preventable deaths, especially in rural areas (KEMSA Annual Report, 2021). Furthermore, despite efforts to modernize procurement, only 35% of public health facilities have implemented some form of e-procurement, with many not fully utilizing these systems (Ministry of Health, 2021). This limited adoption continues to perpetuate reliance on inefficient

manual processes, leading to ongoing issues such as stockouts, wastage, and heightened vulnerability to corruption.

The predominantly manual procurement processes in Kenya's healthcare sector, characterized by paper-based systems, are prone to delays, errors, and corruption. The inefficiencies of these systems were starkly illustrated during the KEMSA COVID-19 scandal in 2020, which involved the misappropriation of approximately KES 7.8 billion (about USD 72 million) intended for the procurement of Personal Protective Equipment (PPE) and other medical supplies (Office of the Auditor-General, 2021). The scandal, marked by significant delays in the distribution of critical supplies and the procurement of substandard products, further exacerbated the country's health crisis. This incident reflects broader systemic issues within healthcare procurement processes, where the absence of transparency and prolonged procurement cycles create opportunities for corruption and mismanagement. Reports by Transparency International (2021) reveal that around 25% of public health funds in Kenya are lost due to such inefficiencies, with procurement cycles often taking up to 60 days—double the recommended timeframe—contributing to frequent stockouts and wastage in healthcare facilities (Ministry of Health, 2021).

Several studies have examined procurement practices and their influence on supply chain performance in Kenya's healthcare sector. For instance, Muthoni and Kariuki (2021) found that implementing e-procurement systems in Nairobi's public hospitals led to a 25% reduction in procurement cycle times and a 20% increase in procurement accuracy. Njagi and Mugambi (2020) also highlighted significant improvements in transparency and accountability through e-procurement in public hospitals in Central Kenya. However, these studies primarily focus on specific institutions or regions and do not fully address the broader influence on entities like KEMSA, or how e-procurement can mitigate the systemic issues of corruption and inefficiency. Moreover, the scalability of these practices across the national healthcare system remains underexplored. To address these gaps, the current study sought to provide a comprehensive analysis of the effect of electronic procurement practices on supply chain performance at KEMSA, aiming to enhance the efficiency, transparency, and overall effectiveness of procurement in Kenya's healthcare sector.

### **Objectives of the Study**

The main focus of the study was to examine the effect of electronic procurement practices on supply chain performance at Kenya Medical Supplies Authority.

This study was guided by the following specific objectives;

- i. To establish the effect of electronic purchase on supply chain performance at Kenya Medical Supplies Authority.
- ii. To assess the effect of electronic payment on supply chain performance at Kenya Medical Supplies Authority.

## **LITERATURE REVIEW**

### **Theoretical Framework**

#### **Technology Acceptance Model**

The Technology Acceptance Model (TAM) is a theoretical framework that sought to explain and predict how users come to accept and use technology. Developed by Davis (1989), TAM specifically addresses the factors that influence individuals' decisions to adopt new technologies, particularly information systems. The model posits that two primary factors—perceived ease of use and perceived usefulness—determine a user's intention to use a

technology, which in turn affects actual usage behavior. Perceived ease of use refers to the degree to which a person believes that using a particular technology would be free from effort. If users feel that a technology is easy to learn and operate, they are more likely to adopt it. This aspect emphasizes the importance of user-friendly design and intuitive interfaces in promoting technology acceptance (Shareef, Dwivedi & Kumar, 2019). On the other hand, perceived usefulness reflects the extent to which a person believes that using a specific technology would enhance their job performance or provide benefits in a broader context. When users recognize the potential advantages of a technology, such as increased efficiency or improved outcomes, they are more likely to form a positive intention to use it. TAM has been widely applied across various fields, including education, healthcare, and business, making it a versatile tool for understanding technology adoption. Researchers often utilize the model to evaluate new systems, software, or applications, gathering insights into user attitudes and potential barriers to acceptance. This can inform the design and implementation of technologies to better meet user needs and enhance the likelihood of successful adoption. For instance, in educational settings, understanding students' perceptions of a learning management system can help institutions improve its features and usability (Marcilianus, 2023).

The Technology Acceptance Model (TAM) operates on several foundational assumptions that shape its application and effectiveness. One primary assumption is that users are rational decision-makers who evaluate technology based on its perceived ease of use and perceived usefulness. This rational approach implies that individuals will logically assess the benefits and challenges associated with adopting a technology before making their decisions (Kitunzi, 2020). Additionally, TAM assumes that these perceptions are largely influenced by the design and functionality of the technology itself, suggesting that improvements in user interface and performance will directly enhance user acceptance. The model also posits that the relationship between intention and actual usage behavior is strong, indicating that a positive intention will reliably lead to technology adoption (Munubi, Kinanga & Ondiba, 2020)

Despite its widespread use, TAM has faced several critiques that highlight its limitations. One significant critique is its narrow focus on only two constructs—perceived ease of use and perceived usefulness—overlooking other critical factors that influence technology acceptance. For instance, social influences, organizational culture, and individual user differences, such as prior experiences and motivations, can all significantly impact acceptance but are not captured in the original model. Critics argue that this oversimplification may limit the model's predictive power in complex environments where multiple variables are at play (Ndeti & Mutuku, 2021). Moreover, TAM has been criticized for assuming a linear relationship between the key constructs and user behavior. In reality, the process of technology acceptance is often nonlinear and dynamic, influenced by feedback loops, changing perceptions, and external factors. This limitation suggests that TAM may not fully account for how users adapt to or integrate new technologies over time. Additionally, some studies have shown that the model's predictive validity can vary across different contexts and user populations, raising questions about its generalizability (Shareef, Dwivedi & Kumar, 2019). Another critique relates to the model's reliance on self-reported measures of perceived ease of use and usefulness. These subjective assessments can be influenced by personal biases, leading to potential discrepancies between intention and actual behavior. This reliance on self-reporting may obscure the complexities of user interactions with technology, including situational factors that impact acceptance. As a response to these critiques, researchers have developed extensions and modifications to TAM, integrating additional constructs and adapting the model to reflect the multifaceted nature of technology acceptance more accurately (Kinanga & Ondiba, 2020). This theory was relevant in establishing the effect of electronic purchase on supply chain performance at Kenya Medical Supplies Authority.

## **Diffusion of Innovations Theory**

Innovation Diffusion Theory (IDT) is a framework that sought to explain how new ideas, technologies, or practices spread within a social system over time. Developed by Everett Rogers (1962) in his seminal work, "Diffusion of Innovations," the theory outlines several key elements that influence the adoption process. At its core, IDT emphasizes the role of communication channels, social systems, and the perceived attributes of the innovation itself in determining how quickly and widely an innovation is adopted (Alistair, *et al*, 2024). One of the central components of IDT is the classification of adopters into distinct categories based on their willingness to embrace new innovations. These categories include innovators, early adopters, early majority, late majority, and laggards. Innovators are those who are the first to adopt, often driven by a desire for novelty or a tolerance for risk. Early adopters follow closely and are typically more socially connected and influential, playing a crucial role in persuading others to adopt. The early and late majority represent the bulk of adopters who require more reassurance before making a commitment, while laggards are resistant to change and may adopt only when it becomes absolutely necessary (Ngereza & Iravo, 2023).

The theory also identifies several attributes of innovations that impact their diffusion: relative advantage, compatibility, complexity, trialability, and observability. Innovations perceived as having a clear advantage over existing alternatives tend to diffuse more rapidly. Compatibility with existing values and practices, ease of understanding and use, the ability to be tested on a limited basis, and visibility to others also significantly influence adoption rates. These attributes help potential adopters assess the innovation's potential benefits and align them with their own needs and experiences (Lynnchristine, 2020). Another critical aspect of IDT is the role of social systems and communication channels in facilitating or hindering the diffusion process. Social networks, peer influence, and opinion leaders can significantly impact how quickly an innovation spreads. Mass media, personal networks, and community organizations play important roles in disseminating information about the innovation, shaping perceptions, and creating a supportive environment for adoption. Understanding these dynamics allows innovators and change agents to develop strategies that enhance the likelihood of successful diffusion (Ngereza & Iravo, 2023).

Innovation Diffusion Theory (IDT) operates on several key assumptions that shape its framework and applications. One primary assumption is that the adoption process is a linear progression, moving from awareness to decision, implementation, and confirmation. This perspective implies that individuals systematically evaluate an innovation based on its attributes and their own circumstances before deciding to adopt it (Lubanga *et al*, 2021). Additionally, IDT assumes that social networks and communication channels function optimally to disseminate information, allowing innovations to spread efficiently. This view highlights the importance of early adopters and opinion leaders in influencing the broader population. However, these assumptions may not account for the complexities of real-world decision-making, where adoption can be more chaotic and influenced by numerous external factors (Muhia & Afande, 2020).

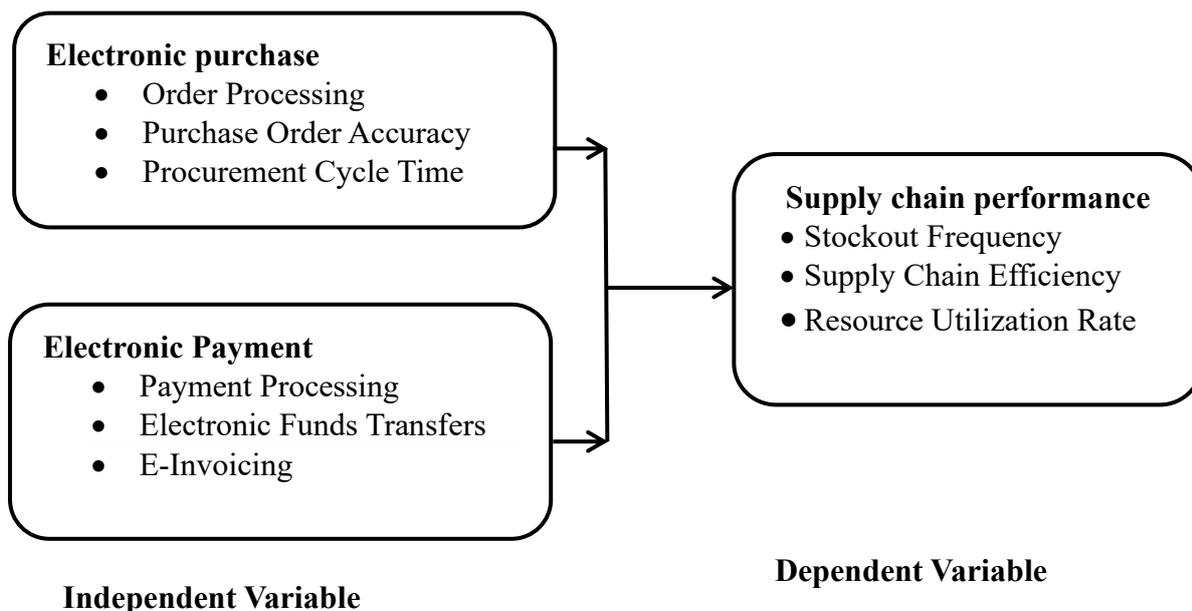
Critiques of IDT often center around its perceived oversimplification of the adoption process. Critics argue that the linear model does not capture the non-linear and iterative nature of how individuals and organizations engage with innovations. For instance, users may cycle back to earlier stages, reconsidering their decisions based on new information or changing contexts. Furthermore, the categorization of adopters can be limiting, as it overlooks the diverse motivations and behaviors of individuals within these groups. Not all innovators or early adopters share the same characteristics or influences, which can lead to an incomplete understanding of the adoption process (Ngereza & Iravo, 2023). Another significant critique of IDT is its focus on individual decision-making rather than considering broader systemic and cultural factors that influence adoption. For example, the theory may underemphasize the role

of institutional barriers, economic conditions, or cultural values that can either facilitate or hinder the diffusion of innovations. Critics argue that by concentrating primarily on individual choices and perceived attributes of innovations, IDT risks neglecting the social, political, and economic contexts that shape adoption dynamics (Muhia & Afande, 2020).

Moreover, the theory has been criticized for its tendency to idealize the role of communication channels. While effective communication is crucial for diffusion, the assumption that information flows smoothly and reaches all potential adopters is often unrealistic. Barriers such as misinformation, mistrust, or lack of access to communication networks can impede the diffusion process. This critique highlights the need for a more nuanced understanding of how communication dynamics operate in different environments, particularly in marginalized communities where information may not be as readily accessible (Alistair, *et al*, 2024). This theory was relevant in assessing the effect of electronic payment on supply chain performance at Kenya Medical Supplies Authority.

### Conceptual Framework

A conceptual framework is a structured system of concepts, assumptions, expectations, beliefs, and theories that supports and guides research. It serves as a blueprint or map, showing the relationships between different variables and concepts relevant to the study. The framework helps researchers clarify the problem being studied, provide a basis for interpreting findings, and outline how the variables interact or influence one another. Figure 2.1 presents the conceptual framework that will guide this study;



**Figure 2. 1: Conceptual Framework**

#### Electronic Purchase

Electronic purchasing, or e-purchasing, refers to the process of acquiring goods and services through online platforms and systems (Shareef, Dwivedi & Kumar, 2019). This method enables organizations to streamline their procurement activities by automating the purchasing cycle, from requisition to payment. E-purchasing systems often integrate with inventory management and enterprise resource planning (ERP) systems, allowing for real-time tracking of orders, budgets, and supplier performance (Marcilianus, 2023). By utilizing electronic catalogues and online marketplaces, buyers can easily compare products, access detailed information, and make informed purchasing decisions. Order processing refers to the sequence of steps that a business follows to fulfill a customer order, from the initial order placement to the final delivery

of goods or services (Munubi, Kinanga & Ondiba, 2020). This process includes order entry, inventory checks, picking and packing items, shipping, and invoicing. Efficient order processing is crucial for ensuring customer satisfaction, as delays or errors can lead to dissatisfaction and lost sales. By leveraging technology, such as automated order management systems, businesses can streamline their order processing workflows, reduce manual errors, and enhance communication between departments (Kitunzi, 2020). This efficiency not only improves turnaround times but also helps maintain accurate inventory levels and fosters stronger customer relationships.

Purchase order accuracy refers to the precision with which purchase orders are created, managed, and fulfilled (Ndeti & Mutuku, 2021). Accurate purchase orders are essential for minimizing errors, ensuring that the correct items are ordered and delivered in the right quantities and at the right prices. Inaccuracies can lead to discrepancies in inventory, financial records, and supplier relationships (Shareef, Dwivedi & Kumar, 2019). Implementing robust procurement systems, including e-purchasing platforms and automated validation checks, can enhance purchase order accuracy. By ensuring that purchase orders are error-free, organizations can improve operational efficiency, reduce costs associated with returns or reorders, and foster trust and reliability in supplier partnerships (Kinanga & Ondiba, 2020).

Procurement cycle time is the total duration required to complete the procurement process, from identifying a need for goods or services to the final acquisition (Ndeti & Mutuku, 2021). This metric is vital for assessing the efficiency of procurement operations, as shorter cycle times can lead to faster project execution and improved responsiveness to market demands. Factors influencing procurement cycle time include the complexity of the sourcing process, the efficiency of communication between stakeholders, and the effectiveness of technology used (Shareef, Dwivedi and Kumar, 2019). By adopting electronic sourcing and procurement solutions, organizations can significantly reduce cycle times through automation, streamlined workflows, and enhanced collaboration. This efficiency not only leads to cost savings but also strengthens the organization's competitive position in the market (Ndeti & Mutuku, 2021).

### **Electronic Payment**

Electronic payment, often referred to as e-payment, is a digital method of transferring money for goods and services through electronic systems rather than using traditional cash or checks (Alistair, *et al*, 2024). This encompasses a variety of payment methods, including credit and debit cards, online bank transfers, digital wallets, and mobile payment applications. E-payment systems enhance convenience and efficiency, allowing consumers and businesses to complete transactions quickly and securely from anywhere with internet access (Ngereza & Iravo, 2023). Payment processing refers to the series of actions and technologies that facilitate the transfer of funds between buyers and sellers during a transaction (Lynnchristine, 2020). This process involves several steps, including authorization, settlement, and funding, and it can take place through various methods, such as credit cards, bank transfers, or digital wallets. Efficient payment processing is crucial for businesses as it directly impacts cash flow, customer satisfaction, and overall operational efficiency (Ngereza & Iravo, 2023). By leveraging electronic payment systems, organizations can streamline their payment processes, reduce manual errors, and accelerate transaction times, ultimately enhancing the customer experience and improving financial management (Lubanga *et al*, 2021).

Electronic funds transfers (EFT) are a method of transferring money electronically between bank accounts, eliminating the need for physical checks or cash (Muhia & Afande, 2020). EFTs encompass various transaction types, including direct deposits, wire transfers, and automated clearing house (ACH) payments. This technology allows for quick and secure transfers, making

it an essential tool for businesses and individuals alike. EFTs enhance efficiency by reducing processing times and minimizing the risks associated with handling physical cash (Ngereza & Iravo, 2023). Furthermore, they often come with built-in security features, ensuring that transactions are safeguarded against fraud and errors, ultimately fostering trust and reliability in financial dealings.

E-invoicing, or electronic invoicing, is the process of sending and receiving invoices in a digital format rather than traditional paper-based methods (Ngereza & Iravo, 2023). This technology streamlines the invoicing process, allowing businesses to automate invoice generation, submission, and payment tracking. E-invoicing enhances efficiency by reducing processing times, minimizing errors, and improving visibility into payment statuses (Alistair *et al*, 2024). Additionally, it supports better compliance with tax regulations and accounting standards (Muhia & Afande, 2020). By adopting e-invoicing solutions, organizations can optimize their accounts payable and receivable processes, improve cash flow management, and strengthen relationships with suppliers through timely and accurate invoicing

## **Empirical Review**

### **Electronic Purchase and Supply chain performance**

Shareef, Dwivedi and Kumar (2019) researched on the electronic purchase in an electronic commerce environment: A trade-off between controlling measures and operational performance. A survey was conducted to capture their opinion based on the previous experiment. The study identified that in e-commerce, operational performance and trust have potential impact on pursuing consumers' purchase intention. This research indicated that trust is the governing issue in promoting e-commerce purchase. However, the exploratory research concluded that to ensure trustworthiness, managers of e-commerce should give most priority to security-related issues of the site and transaction; still consumers are not that much concerned about privacy. If security is ensured, consumers' psychological perception of anxiety about uncertainty will automatically be reduced.

Marcilianus (2023) assessed the effect of electronic purchasing on the procurement performance in public organisation: a case of Tanesco headquarters Dar es Salaam. A descriptive research design was used. The population of the study comprised of 90 TANESCO employees of the finance and procurement staff where 73 of them were purposely sampled. The study employed questionnaire as a data collection tool and the analysis of the collected data was done through descriptive and multiple linear regression analysis. The study found that e-purchasing have a significant improvement in the speed and efficiency of the procurement process, reduced administrative burden, and enhanced transparency. The study concludes that electronic purchasing has a significantly positive effect on procurement performance at TANESCO HQ Dar es Salaam.

Munubi, Kinanga and Ondiba (2020) investigated on the effects of electronic purchasing on organizational performance: a case study of major supermarkets in Nairobi County. The research applied descriptive methods. The target population of the study was the 619 employees working in the departments of procurement, marketing, finance and administration of the four major supermarkets in Nairobi County. The study found that e- purchasing saves time, enables the supermarkets to get information about the goods suppliers, facilitates accessing pricelists and catalogues from suppliers, it enables the supermarkets to interact with their customers and suppliers online and enables the supermarkets to find out what their customers want. The study also concludes that the use of e- payment plays an important role in the enhancing the performance of the supermarkets, it was revealed that the by using e-payment the procedures involved are reduced making the entire process very efficient and hence improved performance.

Kitunzi (2020) conducted a case study on the influence of electronic purchasing on organizational performance: the case of Kenya association of manufacturers firms in Nairobi County, Kenya. The study adopted a descriptive approach to establish the influence of e-procurement on organizational performance of manufacturing firms. A sample size of 102 respondents was selected from a list of 499 manufacturing firms in Nairobi, Kenya. The findings indicate that there is a significant positive relationship between electronic purchasing with the organizational performance of manufacturing firms in Nairobi County Kenya. The study concluded that manufacturing firms in Nairobi need to incorporate all the electronic purchasing into the system to enable them to improve the overall performance of their firms.

Ndeti and Mutuku (2021) researched on electronic purchasing and performance of non-governmental organizations in Kenya; Empirical evidence from pathfinder international, Kenya. The study adopted descriptive research design. The target population for the study was 135 participants. Census survey was employed whereby the entire population of 135 procurement staff were required to participate. The study revealed that there was a strong significant correlation between electronic purchasing and performance. The study concluded that electronic purchasing and performance of organizations was indeed related and it was recommended that all procurement systems be made mandatory and that the procurement teams be well trained on all systems used to ensure efficiency is achieved through use of e-procurement.

### **Electronic Payment and Supply chain performance**

Alistair *et al* (2024) conducted an investigation on tools without skills: exploring the moderating effect of absorptive capacity on the relationship between e-payment tools and category. Survey data collected from 297 procurement executives of large companies in ten countries is analysed using confirmatory factor analysis and hierarchical moderated regression. The results demonstrate few significant direct effects of e-payment tools on category performance. All performance measures studied are enhanced when dimensions of absorptive capacity and their interactions with the e-purchasing tools are added. Specifically, buyer competence, manager competence and communications climate have performance-enhancing effects. The study concluded that many technologies can easily be purchased in the market, so a stand-alone e-payment system may, at best, deliver a temporary advantage.

Lynchristine (2020) studied on the impact of electronic payment on performance of Tanzania posts corporation (TPC). The study adopted a case study research design to attain its objectives. The sample size for the study was 62 respondents. Purposive sampling technique was used whereby questionnaire, interviews, observation and documentary review were used to collect data. In this study, it was found that there was a statistically insignificant increase in performance before adoption of electronic payment and after adoption of electronic payment, whereby profitability of items posted in mails and logistic business, financial and Authority business and courier business was assessed, also Return on Asset and Marginal ratio were used as indicators. The study concluded that customers needed TPC services in the era of electronic payment in spite of development of other forms of communication.

Ngereza and Iravo (2023) examined on the challenges influencing implementation of electronic payment systems: A case study of Kenya Airways Company The researcher adopted a descriptive research design. The study was based on Kenya Airways Company, a leading national carrier whose core business is transportation of passengers and luggage in Kenya and across the borders. It was evident from the findings that Kenya airways EPS process was not effective. It was also found that the firm had no staff training policy on the process with majority of the staff involved in procurement just relying on seminar training to run the procurement unit. The findings from the research gave conclusion that focused on the need to establish training programmes as well as maintaining high organizational culture.

Lubanga *et al* (2021) investigated on the factors influencing adoption of e-payment system in Kenyan public transport: A case of matatu plying Nairobi-Kitengela route. The study was an exploratory study. The total population of the study was the stakeholders in the public transport sector in Kenya, whereas the target population was the operators of companies and Savings and Cooperative Societies (SACCOs) operating public transport business on the Nairobi-Kitengela route. A sample size of 195 respondents was chosen for this study. The study found out that introduction of e-payment system is in line with matatu industry policy. The study concluded that e-payment system in the matatu industry would increase efficiency.

Muhia and Afande (2020) researched on adoption of e-payment and procurement performance in state corporations in Kenya (A Case of Kenya Revenue Authority). The researcher adapted a descriptive research design. Through random stratified sampling method the researcher selected 45 respondents out of total of the 90 population of the staff from relevant Findings of the study indicate that electronic payment positively influenced procurement performance in Kenya Revenue Authority as it leads to instant responses and real-time information. The study concluded that electronic payment positively influenced procurement performance in Kenya Revenue Authority.

## **RESEARCH METHODOLOGY**

This study used descriptive research design to collect both qualitative and quantitative data. Descriptive research design is concerned with systematic collection and analysis of data in order to describe the current state of affairs. It involves measurement, classification, analysis, comparison and interpretation of data (Kombo & Tromp, 2019). The target population consisted of 175 management-level employees at the Kenya Medical Supplies Authority (KEMSA). The unit of observation was specifically 175 management employees across various departments who are directly involved in or oversee procurement and supply chain activities. Due to the small size of target population, census sampling technique was adopted. Therefore, the sample size for the study was 175 respondents. Data was collected by use of structured questionnaires. Quantitative data collected was analysed by the use of descriptive statistics which include percentages, means, standard deviations and frequencies. This study also conducted inferential statistics through correlation analysis and regression analysis.

## **RESEARCH FINDINGS AND DISCUSSION**

The study initially targeted 175 respondents. However, after excluding 18 respondents who participated in the pilot study, the final target population for the main study was 157 respondents. Out of the 157 distributed questionnaires, 150 were duly completed and returned, representing a revised response rate of 95.5%. According to Mugenda and Mugenda (2019), a response rate of 50% is considered adequate, 60% is good, and a response rate of 70% and above is excellent. Therefore, the response rate achieved in this study is considered excellent, providing reliable data for analysis. The high response rate is attributed to the effective follow-up by the researcher and the interest of respondents in the topic.

### **Descriptive Statistics**

This section presents descriptive analysis for each objective based on responses to the questionnaire statements. The purpose is to assess the level of agreement among respondents on each e-procurement practice and its perceived effect on supply chain performance at KEMSA. The responses were rated on a 5-point Likert scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5). The means were interpreted using the following scale: 1.00 – 1.49 = Strongly Disagree, 1.50 – 2.49 = Disagree, 2.50 – 3.49 = Neutral, 3.50 – 4.49 = Agree, and 4.50 – 5.00 = Strongly Agree, reflecting respondents' perceptions of the various e-procurement practices and their impact on supply chain performance.

## Electronic Purchase and Supply Chain Performance

The first objective of the study was to determine the effect of electronic purchasing on supply chain performance at KEMSA. Respondents rated six statements assessing how the electronic purchasing system influences workflow efficiency, accuracy, and procurement speed. Table 1 presents the summary of findings.

**Table 1: Descriptive Statistics for Electronic Purchase**

Statement	Mean	Standard Deviation (SD)
The electronic purchasing system streamlines the order processing workflow.	4.340	.661
I believe that the automation of procurement tasks accelerates the purchasing process.	4.313	.684
Electronic purchasing significantly shortens the overall procurement cycle time.	4.280	.721
The electronic purchasing system ensures a high level of accuracy in purchase orders.	4.260	.747
I find the electronic platform easy to use for placing orders.	4.220	.765
I rarely encounter errors in purchase orders generated through the electronic platform.	4.193	.778
<b>Aggregate Mean and Standard Deviation</b>	<b>4.268</b>	<b>.726</b>

The statement that the electronic purchasing system streamlines the order processing workflow received the highest rating (Mean = 4.340, SD = .661), indicating that respondents strongly agree the system enhances efficiency and reduces complexities in order processing. The belief that automation accelerates the purchasing process (Mean = 4.313, SD = .684) also scored highly, suggesting that system-driven operations speed up procurement activities by minimizing human intervention.

Respondents further agreed that electronic purchasing shortens the overall procurement cycle time (Mean = 4.280, SD = .721), highlighting how automation eliminates delays associated with manual processes. The system's role in ensuring accuracy in purchase orders (Mean = 4.260, SD = .747) was also positively perceived, reducing risks of costly errors in healthcare supply procurement. Additionally, the platform was rated as easy to use for placing orders (Mean = 4.220, SD = .765), though slightly lower, implying general satisfaction with user-friendliness. The view that errors in purchase orders are rare (Mean = 4.193, SD = .778) also reflects confidence in the system's reliability.

The aggregate mean score of 4.268 (SD = .726) confirms strong agreement that electronic purchasing significantly enhances supply chain performance at KEMSA by improving accuracy, efficiency, and process speed. This finding is consistent with Marcilianus (2023), who found that e-purchasing improved procurement speed, reduced administrative burdens, and enhanced transparency at TANESCO headquarters. Similarly, Munubi, Kinanga, and Ondiba (2020) reported that electronic purchasing in Nairobi's supermarkets saved time, reduced errors, and enabled real-time interaction with suppliers and customers. Both studies support the current findings by affirming that electronic purchasing improves operational performance, accuracy, and responsiveness—key drivers for a healthcare supply chain's effectiveness at KEMSA.

## Electronic Payment and Supply Chain Performance

The second objective of the study was to assess the effect of electronic payment on supply chain performance at KEMSA. Respondents rated six statements that evaluated the platform's

efficiency, security, and user experience in processing payments and handling e-invoices. Table 2 presents summary of findings obtained.

**Table 2: Descriptive Statistics for Electronic Payment**

Statement	Mean	Standard Deviation (SD)
The electronic payment system streamlines the payment processing workflow.	4.340	.691
The electronic system allows for seamless transfer of funds between accounts.	4.287	.704
I feel confident that my financial data is secure during electronic funds transfers.	4.267	.732
I find the electronic payment platform easy to navigate and use.	4.247	.743
The e-invoicing system simplifies the invoicing process for my organization.	4.220	.751
I find it easy to review and approve e-invoices using the electronic platform.	4.200	.779
<b>Aggregate Score</b>	<b>4.260</b>	<b>.734</b>

The highest-rated statement was that the electronic payment system streamlines the payment processing workflow (Mean = 4.340, SD = .691), showing that respondents strongly agree the system enhances payment efficiency by reducing manual handling and associated delays. Additionally, respondents agreed that the system enables seamless transfer of funds between accounts (Mean = 4.287, SD = .704), confirming that electronic payments support real-time transactions essential in a fast-paced supply chain environment.

Confidence in the security of financial data during electronic fund transfers (Mean = 4.267, SD = .732) was also evident, suggesting that users trust the system's safeguards—a critical factor in digital payments. Moreover, ease of navigating and using the electronic payment platform (Mean = 4.247, SD = .743) was well rated, reflecting a generally user-friendly interface. The system's role in simplifying invoicing processes (Mean = 4.220, SD = .751) and ease of reviewing and approving e-invoices (Mean = 4.200, SD = .779) were positively acknowledged, though these scored slightly lower—indicating that while e-invoicing is beneficial, continuous improvement could enhance its efficiency.

The aggregate mean score of 4.260 (SD = .734) demonstrates solid agreement that electronic payment systems improve supply chain performance at KEMSA by streamlining workflows, enhancing data security, and simplifying invoicing. These findings align with Muhia and Afande (2020), who reported that electronic payment systems at Kenya Revenue Authority enhanced procurement performance by providing instant responses and real-time information. Similarly, Lubanga et al. (2021) found that e-payment systems in Kenya's matatu industry improved efficiency, mirroring KEMSA's experience. Both studies support the conclusion that adopting electronic payment systems enhances operational speed, accuracy, and financial controls, which are crucial for healthcare supply chain performance.

### Supply Chain Performance

The final part of the descriptive analysis focused on assessing the current supply chain performance at KEMSA. Respondents rated six statements addressing communication, stock management, responsiveness, coordination, and resource utilization within the supply chain. Table 3 presents summary of findings obtained.

**Table 3: Descriptive Statistics for Supply Chain Performance**

Statement	Mean	Standard Deviation (SD)
Stockouts negatively impact our overall customer satisfaction.	4.373	.664
The communication between suppliers and our team helps prevent stockouts.	4.333	.682
I find that coordination among supply chain partners enhances overall efficiency.	4.313	.701
I believe that high resource utilization rates positively impact our supply chain performance.	4.287	.716
Our organization effectively utilizes resources throughout the supply chain.	4.247	.739
The current supply chain management system supports rapid response to changes in demand.	4.220	.753
<b>Aggregate Mean and Standard Deviation</b>	<b>4.296</b>	<b>.709</b>

The highest-rated concern was that stockouts negatively impact overall customer satisfaction (Mean = 4.373, SD = .664), reflecting respondents' awareness of how stock unavailability directly undermines service delivery, especially critical in healthcare supply chains. Equally important was the view that communication between suppliers and the internal team helps prevent stockouts (Mean = 4.333, SD = .682), indicating that maintaining strong supplier relationships is key to ensuring consistent product availability.

Additionally, respondents acknowledged that coordination among supply chain partners enhances overall efficiency (Mean = 4.313, SD = .701), highlighting the need for collaborative efforts in healthcare supply chains to optimize operations. The belief that high resource utilization positively impacts supply chain performance (Mean = 4.287, SD = .716) further emphasizes the importance of maximizing capacity and minimizing waste. The organization's effective utilization of resources (Mean = 4.247, SD = .739) and the supply chain's ability to respond rapidly to demand changes (Mean = 4.220, SD = .753) were also rated positively, though these areas indicate opportunities for strengthening real-time adaptability.

The aggregate mean score of 4.296 (SD = .709) indicates strong agreement that KEMSA's supply chain performance is influenced by effective communication, coordination, and resource utilization. These findings align with Marcilianus (2023), who emphasized that effective e-purchasing systems enhance resource use and responsiveness in public sector procurement. Similarly, Munubi, Kinanga, and Ondiba (2020) noted that good supplier interaction, enabled through electronic platforms, improves operational efficiency and reduces stockout risks. Both studies reinforce the idea that strong supplier communication, efficient resource use, and responsive systems are critical in maintaining consistent supply chain performance, especially in healthcare sectors like KEMSA where stockouts directly impact lives.

### Correlation Analysis

Correlation analysis was conducted to determine the strength and direction of the relationships between e-procurement practices—Electronic Purchase, and Electronic Payment—and Supply Chain Performance at KEMSA. The Pearson correlation coefficient ( $r$ ) was used, where values closer to +1 indicate a strong positive relationship, values near -1 suggest a strong negative relationship, and values around 0 show no correlation.

**Table 4: Correlation Analysis Results**

		Supply Chain Performance	E-Purchase	E-Payment
Supply Chain Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	150		
E- Purchase	Pearson Correlation	.758**	1	
	Sig. (2-tailed)	.001		
	N	150	150	
E- Payment	Pearson Correlation	.733**	.266	1
	Sig. (2-tailed)	.021	.278	
	N	150	150	150

The correlation between Electronic Purchase and Supply Chain Performance is  $r = 0.758$  ( $p = 0.000$ ), indicating the strongest positive relationship among the variables. This suggests that automating purchasing processes at KEMSA significantly enhances supply chain performance by improving order accuracy, reducing cycle times, and ensuring timely procurement of essential medical supplies. This finding aligns with Marcilianus (2023), who observed that electronic purchasing enhances procurement speed and transparency in public organizations. Munubi et al. (2020) also emphasized that e-purchasing reduces administrative burdens and supports better supplier interaction, which is critical in healthcare environments like KEMSA.

Similarly, Electronic Payment shows a strong positive correlation with supply chain performance ( $r = 0.733$ ,  $p = 0.000$ ), indicating that digital payments and e-invoicing systems improve transaction speed, financial control, and supplier trust at KEMSA. This is consistent with Muhia and Afande (2020), who noted that e-payment systems enhance real-time information sharing and procurement performance in public institutions. Additionally, Lubanga et al. (2021) found that e-payment adoption improves efficiency and reduces operational delays in Kenya's public transport sector, a finding applicable to healthcare procurement.

### Multiple Regression Analysis

Multiple regression analysis was conducted to determine the extent to which Electronic Purchase, and Electronic Payment collectively and individually influence Supply Chain Performance at KEMSA. The regression coefficients provide insights into the individual impact of each e-procurement practice on supply chain performance.

**Table 5: Regression Coefficients of Study Variables**

Variable	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig. (p-value)
Constant	0.533	0.178	-	2.994	0.003
Electronic Purchase	0.251	0.061	0.262	4.115	0.000
Electronic Payment	0.216	0.056	0.217	3.857	0.000

Electronic Purchase ( $B = 0.251$ ,  $p = 0.000$ ). Electronic Purchase emerged as the strongest predictor. This means that a one-unit increase in electronic purchasing improves supply chain performance by 0.251 units. This impact reflects how automating procurement tasks such as order generation and processing reduces administrative errors, enhances procurement accuracy, and shortens lead times. The finding is supported by Kitunzi (2020), who concluded that integrating electronic purchasing improves operational efficiency in Kenya's manufacturing firms.

Electronic Payment ( $B = 0.216$ ,  $p = 0.000$ ). Electronic Payment also had a strong positive effect, showing that an increase in electronic payment efficiency by one unit results in a 0.216-

unit increase in supply chain performance. This demonstrates that seamless digital payments improve supplier relationships, reduce delays, and ensure timely disbursement of funds. This aligns with Ngereza and Iravo (2023), who emphasized the need for fully integrated e-payment systems to realize operational gains in large organizations like KEMSA.

Based on the regression results, the fitted equation predicting Supply Chain Performance (SCP) at KEMSA is:

$$SCP = 0.533 + 0.251 (\text{Electronic Purchase}) + 0.216 (\text{Electronic Payment})$$

## **Conclusions**

Electronic purchasing emerged as the most influential factor in enhancing supply chain performance. The system reduces errors, speeds up order processing, and improves accuracy in procurement operations. Its strong predictive power confirms that automating purchasing activities is essential for better inventory control, resource utilization, and timely delivery of healthcare supplies.

The study concludes that electronic payment systems improve financial efficiency, accuracy, and supplier confidence. By automating transactions and streamlining e-invoicing, KEMSA has strengthened its cash flow management and reduced payment delays. This directly supports supplier relationships and contributes to overall supply chain reliability.

## **Recommendations**

### **Recommendation on Electronic Purchasing**

Given the significant influence of electronic purchasing on supply chain performance, KEMSA should prioritize further automation of its purchasing processes. This includes integrating real-time inventory management systems with the purchasing platform to minimize stockouts and overstocking risks. Staff should be regularly trained on the system to ensure accuracy and efficiency in order placements. KEMSA should also consider integrating predictive analytics tools to support demand forecasting, allowing proactive purchasing decisions that ensure continuous availability of essential medical supplies, especially during public health emergencies.

### **Recommendation on Electronic Payment**

KEMSA should strengthen its electronic payment systems to further improve financial efficiency and build supplier trust. Timely supplier payments should be prioritized to avoid supply disruptions, especially in the healthcare sector where delays can directly impact patient care. The organization should review and upgrade its e-invoicing systems to ensure accuracy, simplify invoice approvals, and enhance financial transparency. Additionally, regular audits and system checks should be performed to guarantee data security and protect against fraudulent activities. Building supplier confidence through reliable payment systems will strengthen partnerships and improve procurement outcomes.

### **Suggestions for Further Research**

Future studies could investigate other factors influencing supply chain performance, such as staff capacity, regulatory compliance, supplier relationship management, and technological infrastructure challenges unique to the healthcare sector. Additionally, research could focus on the impact of emerging technologies like artificial intelligence (AI), blockchain, and machine learning in enhancing procurement efficiency and supply chain resilience, particularly in public health institutions managing essential medical supplies.

## REFERENCES

- Achieng, J., & Ondiek, G. (2020). E-Procurement Practices and Supply Chain Performance in East African Health Organizations. *African Journal of Supply Chain Management*, 12(2), 55-67.
- Adeyemi, S., & Ojo, A. (2019). E-Procurement Implementation in Nigeria: Progress, Challenges, and Prospects. *Journal of African Business*, 20(2), 145-160.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Brandon-Jones, E., & Carey, S. (2019). The Role of E-Procurement in Enhancing Supply Chain Performance in Healthcare: A Global Perspective. *Journal of Supply Chain Management*, 15(3), 23-41.
- Byiringiro, K. D & Madichie, M. (2022). E-procurement practices and performance of public institutions in Rwanda: a case of Kicukiro District. *The Strategic Journal of Business & Change Management*, 9(4), 7
- Chebets, J & Kihara, A. (2022). Influence of e-procurement on procurement performance in manufacturing firms in Nairobi County. *International Journal of Social Sciences Management and Entrepreneurship*, 6(1), 104-114.
- Gatore, V. (2022). Effect of e-bidding on procurement performance in Rwanda: a case of Kirehe District Public Entities. *European Modern Studies Journal*, 6(6), 176-184.
- Government of Kenya. (2008). Vision 2030: A Globally Competitive and Prosperous Kenya. Government of Kenya.
- Grant, R. (2019). *Contemporary Strategy Analysis, (4 Ed)*. Blackwell Publishers
- Hawa, A, Sitti, H, Abul, H & Suhaiza, I. (2021). Transparency level of the electronic procurement system in Malaysia. *Journal of Financial Reporting and Accounting*, 21(3), 592-608.
- James, L. L & Osoro, A. (2023). E-procurement practices and procurement performance in Turkana County, Kenya. *The Strategic Journal of Business & Change Management*, 10(2), 882–900.
- Kamau, P. & Wanjiru, J. (2022). Optimizing E-Procurement for Improved Health Outcomes in Kenya. *Journal of Healthcare Management*, 22(1), 75-89.
- Kangogo, J & Gakure, R. (2020). Factors affecting electronic procurement implementation in automobile industry of Kenya. *International Journal of Management Sciences*, 1(6), 193-203.
- Karani, J. & Murithi, K. (2021). Supplier Relationship Management and E-Procurement in Public Health Supply Chains. *Journal of Supply Chain Management*, 16(4), 89-104.
- KEMSA. (2021). *Kenya Medical Supplies Authority Annual Report*. Government of Kenya.
- Khan, N., Shukla, S., & Gupta, V. (2020). Adoption of E-Procurement in Healthcare: A European and North American Perspective. *International Journal of Procurement Management*, 13(1), 45-62.
- Muthoni, A. & Kariuki, M. (2021). Factors Influencing the Success of E-Procurement in the Healthcare Sector. *East African Journal of Business and Economics*, 18(2), 31-45.
- Mwangi, J., & Nduta, S. (2020). Challenges in Implementing E-Procurement in Kenya's Health Sector. *Journal of Public Procurement*, 20(3), 233-247.

- Rogers, E. M. (1962). *Diffusion of innovations*. Free Press.
- Scholz, R., & Stein, R. (2020). E-Procurement in German Healthcare: Adoption, Integration, and Outcomes. *Journal of Supply Chain Management*, 16(2), 88-102.
- Sekaran, U., & Bougie, R., (2019). *Research methods for business: A skill building approach* (5th ed.). Chichester, West Sussex:
- Shareef, M. A, Dwivedi, Y. K & Kumar, V. (2019) Electronic purchase in an electronic commerce environment: A trade-off between controlling measures and operational performance. *Information Technology and People*. 32(6), 1345-1375.
- Smith, A., & Flanagan, J. (2018). E-Procurement in the NHS: Achievements and Challenges. *Journal of Health Services Research & Policy*, 23(4), 240-248.
- Transparency International. (2021). *Corruption in Kenya's Health Sector: The Impact on Public Health and Service Delivery*. Transparency International Kenya.
- Wafula, B. P, Namusonfe, G & Okwaro, F. (2020). Effects of e-procurement on the organizational performance of county governments in Kenya: a case study of Bungoma County Government. *International Journal of Recent Research in Commerce Economics and Management*, 4(4), 161-182.
- Waithaka, R. K & Kimani, J. G. (2021). Effect of e-procurement practices on supply chain performance. *Global Journal of Purchasing and Procurement Management*, 1(1), 32-42.
- Wanyama, P. (2019). Adoption of E-Procurement in Public Health Supply Chains: Challenges and Opportunities. *African Journal of Business Management*, 13(4), 88-97.
- Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics*, 22(2), 233-261.
- World Bank. (2020). *Public Expenditure Review: Health Sector Report*. World Bank Group.