



**ELECTRONIC PROCUREMENT STRATEGIES AND SUPPLY CHAIN
PERFORMANCE OF TELECOMMUNICATION FIRMS IN KENYA**

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ABSTRACT

Supply chain performance is a critical determinant of operational efficiency, cost management, and customer satisfaction in telecommunication firms. Despite rapid digital transformation, telecommunication firms in Kenya continue to experience inefficiencies in procurement coordination, supplier integration, and service responsiveness. Although electronic procurement strategies are increasingly adopted, limited empirical evidence exists on their combined effect on supply chain performance within the Kenyan telecommunication sector. This study examined the effect of e-procurement strategies on supply chain performance of telecommunication firms in Kenya. Specifically, the study assessed the influence of e-sourcing, and e-ordering strategies. The study was anchored on Transaction Cost Theory, and the Technology Acceptance Model. An explanatory research design was adopted. A census approach targeted 25 registered telecommunication firms in Kenya. Primary data were collected using structured questionnaires. A pilot test was conducted on 5 respondents drawn from telecommunication firms not included in the main study to enhance validity and reliability of the instrument. Data were analyzed using descriptive statistics, correlation analysis, and multiple regression analysis. The findings revealed that e-procurement strategies had a positive and statistically significant effect on supply chain performance, explaining 73.6% of the variation in performance. E-ordering exhibited the strongest influence, followed by e-sourcing. The study concluded that integrated electronic procurement systems enhance inventory turnover, order fulfillment efficiency, supplier coordination, and overall operational effectiveness. The study recommended increased investment in integrated digital procurement platforms, strengthened system integration with enterprise systems, and enhanced user alignment to optimize supply chain performance. Future research should examine additional determinants of supply chain performance, including technological infrastructure, organizational culture, supplier competence, and regulatory frameworks. Further studies may also explore moderating and mediating variables such as firm size, digital readiness, and leadership commitment, and adopt longitudinal or cross-sectoral research designs to assess long-term effects.

Key Words: E-Procurement Strategies, Supply Chain Performance, Telecommunication Firms, E-Sourcing, E-Ordering

Background of the Study

The telecommunications field is undergoing a fast change, which is being driven by issues such as 5G deployment, the need to consume more data, and the emergence of new technologies in the universal sector. This dynamic environment places pressure on the old-fashioned procurement practices, which underscores the need to adopt effective e-procurement and effective supply chain management (GSMA Intelligence, 2022).

There are, however, a number of challenges that are experienced in the international arena. Since the COVID-19 pandemic, the global supply chain industry has also drastically increased its costs because of port congestion, fuel price increases, and others (SEMEC, 2023). Several shortages of semiconductors, which are essential elements in telecom equipment, are currently affecting the adoption of new technologies in telecommunication such as 5G. It is attributed to several factors, including the booming consumer electronics demand in the COVID-19 pandemic and production capacity (McKinsey & Company, 2022).

On the international front, in developed economies like the United States, Germany and Japan companies within the telecommunication industry have incorporated a sophisticated e-procurement instruments like supplier portals, automated purchasing systems, e-invoicing and real-time procurement analytics in order to ensure ease of the procurement processes. The World Bank (2022) reports that through the adoption of electronic-procurement in telecommunications, the procurement cycle times have been decreased by 20 percent and there is a significant enhancement in the cooperation between the vendor and the company. The results of these have directly led to better supply chain performance in terms of increased speed of delivery, low cost and reduction of errors within procurement activities. According to EY (2023), 54% of American telcos have been considering diversification of suppliers to lessen reliance on a single source (EY, 2023). This would assist in the reduction of threats arising due to geopolitical concerns or vendor collapse. The fact that some telecom suppliers in the United States (US) are based offshore, especially with regard to essential network equipment, is a significant issue that is threatening these companies to consult firms such as Deloitte in finding solutions that streamline telecom supply chains to leverage analytics and simulation to identify the causes of inefficiency and process optimization to minimize costs and maximize productivity such as mitigating inventory levels (<https://www.anylogistix.com>). The national security issues related to this kind of dependence are evidenced in the actions of the US government against Huawei and ZTE (Supply Chain Review Report, 2023). This may restrict the vendor selection and expose telcos to possible constraints.

Telecommunications companies in the European Union (EU) are making significant investments in the 5G infrastructure implementation, fibre-optics, and cloud computing. This emphasis on innovation enhances their supply chains by requiring agility and responsiveness among their partners (GSMA Intelligence, 2022). The current chip shortage and geopolitics are disrupting the delivery of essential elements to telecommunications devices (European Commission, 2024). Single European Market for Electronic Communications (SEMEC) efforts are promoting a similarity in the devices and services standards, which could improve the process of procurement and eliminate complications in the supply chain (European Commission, 2024). This has contributed to delays, price increases, and network roll out delays (Reuters, 2023).

At the regional level, according to the report of the African Development Bank (2023), e-procurement systems among African telecoms have enhanced compliance, made decisions based on data, and speeded up the reaction to disrupted supply chain. In Africa, the rate of mobile penetration in Nigeria is the largest, which means that the distribution network operates effectively (GSMA Intelligence, 2022). The governmental initiatives such as the National Broadband Plan 2020-2025 are designed to enhance infrastructure and, possibly, optimize logistics (NITDA, 2023). Nevertheless, Nigeria is still facing the impact of poor road networks

and ineffective power supply that is disrupting deliveries and raising lead times. The supply chains may be disrupted by theft and piracy, particularly when it comes to remote locations (JNIM, 2022). The fact that Egypt is a trade hub in North Africa means that it can access international suppliers easily and this could enable it to cut down on costs. The Egyptian government has put the establishment of the Information and Communication Technology (ICT) at the forefront which could be the reason behind supply chain developments (<https://mcit.gov.eg/>). However, complicated customs rules and processes have slowed down imports and made them expensive (DOC, 2023). Egypt is heavily dependent on trade-in telecom equipment which exposes it to global disruption of supply chains (<https://www.worldshopping.global/guide>). South Africa, in its turn, has a relatively well-developed transport network in comparison with other African nations, which helps it to distribute efficiently (<https://www.worldbank.org/en/country/southafrica>). The telecom sector has a more developed regulatory climate in the country, creating stability to supply chain (DOC, 2023).

Also, research conducted in Uganda, indicates that there is a significant correlation between effective supply chain management and organizational performance, a factor which implies that the telecom companies in Uganda have the potential of making efficiency gains by adopting better supply chain management. Areas of improvement are also pointed out in the same study. The sourcing of the raw materials may be costly and not easily available as per specifications. Further, the problems with the quality of goods delivery and reliability in terms of time remain (Muwanga, 2019). A 2013 study by Afera Muluadam Kebede suggests the necessity of creating a standard framework of the internal supply chain measurement. This implies improvement orientation in Ethio Telecom. Like in Uganda, sourcing is a problematic issue to Ethio Telecom. The research has referred to challenges in managing the procurement costs and delivery on time with desired quality (Kebede, 2022).

Statement of the Problem

In telecommunication companies, supply chain performance is a grave determinant of profitability, efficiency in operations and customer satisfaction. Kenya The telecommunication industry, which is dominated by Safaricom, Airtel, and Telkom Kenya, is characterized by continuous challenges that compromise efficiency and responsiveness of their supply chains. According to the reports by the Communications Authority of Kenya (CAK, 2019), supply chain inefficiencies have led to the growth of operation costs by up to 40 percent that directly reduces the profitability of the firm. These inefficiencies are reflected in long lead times, slow response to the market needs in order fulfilment, slow market responsiveness, and high inventory holding costs, which influence customer satisfaction and retention. Moreover, poor supplier quality management and inconsistent procurement procedures are caused by which the level of service disruption and churn rates reached 20 percent (Mwenda et al., 2018).

Various scholars have studied numerous cases in which they relate the electronic-procurement strategies and supply chain performance of telecommunication companies. Albinkhalil (2021) researched the connection between e-sourcing and supply chain performance. The case concluded that e-sourcing led to more performance due to the improvement of supplier relationships and integration. Gaur (2014) studied the effects of e-tendering to the performance of supply chain in the Indian manufacturing companies. The results were that adoption of e-tendering was important in relation to enhanced supply chain performance in terms of proficiency, transparency, and price-efficiency. Wang (2018) conducted research to find out how e-auctioning affects supply chain efficiency. He found that e-auctioning can meaningfully increase supply chain performance through improved transparency, productivity, and transaction cost reduction. Ochieng (2016) did a case to examine the work of e-ordering in enhancing supplychain resilience for 54 SMEs in Kenya and found out that e-ordering can

improve supply chain resilience by enabling better inventory management, risk mitigation, and collaboration with suppliers.

Nevertheless, it's noted few research literatures regarding the connection linking e-procurement strategies and supply chain performance, their focus was on specific e-procurement strategies, and so the findings may not be applicable to the use of e-sourcing, e-ordering, hence the conceptual gap necessitating the proposed study. Additionally, some of these previous studies were conducted outside of Kenya and simply applied descriptive or cross-sectional designs alone. The proposed study used both explanatory and descriptive research methodologies. In light of this, the proposed study aimed to close the methodological, contextual, conceptual, and geographic gaps that have been identified regarding the impact of electronic procurement techniques on supply chain performance in Kenyan telecommunications companies in Kenya.

Research Objectives

The main aim of this research was to assess the association between e-procurement strategies and supply chain performance of telecommunication firms in Kenya.

Specific Objectives

- i) To examine the influence of e-sourcing strategies on supply chain performance of telecommunication firms in Kenya.
- ii) To assess the effect of e-ordering strategies on supply chain performance of telecommunication firms in Kenya.

Research Questions

This study was guided by the following research questions;

- i) How do e-sourcing strategies influence supply chain performance of telecommunication firms in Kenya?
- ii) To what extent do e-ordering strategies affect supply chain performance of telecommunication firms in Kenya?

LITERATURE REVIEW

Theoretical Review

Transaction Cost Theory

A Theory (TCT) in economics and management is a concept that is used to explain the cost of being a part of a market (Benston and Smith, 1976). It was introduced by John R. Commons in 1931 and popularized by Oliver E. Williamson whose work in 2008 gave TCT a lot of attention. TCT argues that making an economic trade has costs involved in it which are called transaction costs. These are law enforcement and authorities cost, negotiation and decision-making cost, and data and search cost (Davis, 1989). It means that these costs are minimized by businesses in their planning of operations, which has an impact on the structure and management decisions. Williamson (2008) identifies the following elements as being the important aspects of transaction costs; uncertainty, frequency, specificity, limited rationality and opportunistic behaviour.

However, the critics say that TCT tends to simplify the nature of economic action and exaggerate the nature of social practices and belief in economic exchange (Mahata et al., 2022). The theory has also been criticized to show an under-socialized perception of human nature and to ad hoc approach (Berry, 2011). Chopra and Sodhi (2014) also have an additional suggestion that risk avoidance may be applied excessively to the extent that it may deter firms to take up innovative or cost-reducing opportunities, hence reducing competitiveness. This

renders the theory to be somehow inefficient in highly dynamic industries like telecommunications where agility and innovation are necessitated.

E-Procurement can be utilized in order to create a quick and cost-efficient procurement system, and TCT may be applied in order to analyze the effectiveness of such strategies not only in terms of production costs. TCT assists in determining the most efficient time of transactions in the market or in an organization, which is essential in making e-procurement decisions (Chang et al., 2013). In the case of the research, this theory is the most suitable one when it comes to e-sourcing strategies. By using e-supplier search, e-supplier evaluation, and electronic data interchange, companies are able to choose reputable suppliers, reduce risks of supply disruption and much better visibility throughout the procurement process. TCT is viewed as a theory of efficient management of transactions and exchange relationships, which can be directly applied to the supply chain management (Brammer and Walker, 2011).

Technology Acceptance Model

In 1989, Fred Davis created this Model, which is a prominent in the field of information systems, that forecasts how people embrace and utilize technology. It is based on the Theory of Reasoned Action (TRA) and was introduced as a response to the need for technology-specific user acceptance models (Davis, 1989). Two principles of TAM, as described by Davis (1989) are: (1) Perceived Ease of Use (PEOU), which measures how much a person thinks utilizing a specific system would be effortless. (2) Perceived Usefulness (PU), It gauges how much a person believes using a particular method would enhance their productivity at work. These two factors determine a user's behavioural intent to consume a new technology, which in turn predicts actual system use.

Nonetheless, though it has been widely used, it has been criticized because of its clarity and explanatory ability, it might not suffice to explain the real-life use of technology especially in complicated situations. The critics of TAM argue that it overlooks the important factors such as the personal characteristics, enabling conditions, and social influence. Kamel, (2014) hold that it does not explain other external factors such as social influence, trust and perceived risk, and it does not comprehensively explain the complexity of user behaviour. On the same note, when TAM is expanded to accommodate green technology acceptance (EA-TAM), it is revealed that the uptake of green technologies has the potential to enhance the performance of logistics, export abilities, and competitiveness, and therefore positively influence the overall supply chain performance (Singh & Chan, 2022).

Such model was important to the study because it focuses on the significance of the design of user-friendly systems and sufficient training to make sure that the technological advances can be converted into benefits in operations, which will be directly related to the effectiveness. To be effective, the procurement workers and the suppliers need to feel that e-ordering systems such as e-purchase order formation, e-catalogues, e-order processing, and e-invoicing are friendly and user-friendly to them. This is connected directly to the main ideas of TAM, which dwell on the perceptions that people have on technology and their intention to use it. TAM hypothesizes that perceived utility and perceived ease of use determine the tendency of people to accept technology. Within the e-ordering environment, employees of telecommunication companies would have to believe that e-ordering is convenient and beneficial to use so that they could adopt and use it.

Empirical Review

E-sourcing Strategy and Supply Chain Performance

Nyanjala (2017) examined how e-sourcing impacts the performance of the supply chain within the telecommunication companies. Descriptive design was used allowing surveys to be used to gather data. The targeted population comprised 5 (five) telecommunication companies in

Kenya. The study discovered that good e-sourcing is very effective in enhancing performance of supply chain. It suggested that best e-sourcing practices should be embraced by the telecommunication companies to improve performance. The research gives an idea about the procurement practices, which are also helpful in the context of e-sourcing strategies. Nevertheless, this research has a few loopholes which are addressed by the suggested survey. It is concerned with general procurement strategies and not necessarily e-sourcing strategies, with overall procurement practices and not e-sourcing strategies.

Albinkhalil (2021) researched the connection between supply chain performance and e-procurement within the manufacturing companies in Iran. The survey entailed empirical analysis the target population of which was 124 firms in various industries in Iran. The researchers came up with the conclusion that e-sourcing enhance supply chain wellbeing in terms of improving the relationships and integration with suppliers. It suggested that organisations ought to automate procurement and enhance relations with their important suppliers. This paper identifies the advantages of e-sourcing strategies. It did not have narrow industry focus, i.e. telecommunication and was not narrow to Kenya. The given research proposal aims at filling these gaps.

Maina (2023) conducted a study about the performance of telecommunication and sustainable e-procurement strategies and businesses in Kenya. Among the objectives was to measure the result of the e-sourcing using descriptive research design was adopted in the survey because information was to be obtained by administration of structured questionnaires to the procurement managers and other personnel in the 6 (six) telecommunication companies. The target population was 62 (sixty-two) procurement workers and managers in the telecommunication companies. The research concluded that the application of electronic procurement strategies including e-sourcing brought about great performance in terms of outcomes. It advised that telecommunication companies are supposed to be comprehensive in implementing the e-sourcing strategies. This research gives literature connotation on the beneficial impact of e-sourcing strategies, which is applicable to the larger context of e-procurement. Nevertheless, this research paper concentrated on general e-procurement and not e-sourcing strategies. It also focuses on sustainable procurement performance and not the performance of supply chain as a whole and although the case was conducted in Kenya, it used a small target population in which procurement managers were surveyed. The proposed research involved a wider scope of companies and surveyed workers of various management levels.

E-Ordering Strategy and Supply Chain Performance

The survey conducted by Ochieng (2016) on the role of e-ordering in enhancing supply chain resilience, at Kenyan SMEs. The primary objective was to determine the importance of e-ordering in improving supply chain success of 54 SMEs in Kenya. Case studies of Kenyan SMEs were the methodology of the research. The results have demonstrated that e-ordering has the potential to enhance the resilience of a supply chain by allowing it to manage inventory, risk, and cooperate with suppliers. The proposed research can find direct application in this study since it focused on Kenya. Although the study is informative, it might not be exhaustive of the competitions and opportunities that larger telecommunications firms in Kenya are enjoying.

Smith (2020) managed an e-ordering case on the performance of the telecommunications supply chain. The major objective tested the implications of e-ordering. on the supply chain performance of telecommunications companies in the United States. It applied case studies of five large telecommunications companies as the methodology. In the US. It turned out that e-ordering has the potential of enhancing the effectiveness of supply chain, reducing costs, and enhancing supplier relationships. This survey shows information about the potential advantages of e-ordering strategies in the telecommunications companies. The research is

limited to the United States and might not fully explain the challenges and opportunities that telecommunications companies encounter in Kenya.

Supply Chain Performance

The study conducted by Kumar and Sharma (2015) is entitled Electronic Procurement Adoption and Supply Chain Performance. The major objective was to examine the connection between supply chain performance and application of e-procurement with Indian manufacturing companies. It was survey research that was carried out on 84 Indian manufacturing companies. The researchers discovered that there is an enormous correlation between e-procurement adoption and supply chain performance. It advised companies to invest in e-procurement systems and come up with good implementation plans. The e-procurement has a tremendous effect on the supply chain performance as illustrated in this study. It is however restricted to the Indian manufacturing firms and may not apply directly to the telecommunication firms in Kenya. The case under consideration focused on the overall relationship between e-procurement adoption and the performance of supply chains. It was also done in India which is another geographical setting with its own challenges and opportunities. It was restricted to Indian manufacturing companies. The intended study examined the impacts of e-procurement strategies in a wider scope that is in Kenya.

The study by Chen and Lin (2017) case survey research was employed, and its target was 82 executives and IT managers of Taiwan automotive companies. The research discovered that IT investments, including enterprise resource planning (ERP) systems and supply chain management (SCM) software have the potential to significantly improve the performance of the supply chain by improving the flow of information, coordination, and decision-making. In this work, the role of IT in ensuring good supply chain management is highlighted. It implies that e-procurement methods as a branch of IT can greatly improve the performance of the supply chains of Kenyan telecom companies. The proposed study can add to the existing body of knowledge by narrowly identifying the effects of e-procurement strategies on supply chain and performance of telecommunication companies that may have different needs and challenges as those of other sectors.

The work by Wang and Lai (2018) examined the performance of the supply chains of Chinese manufacturing companies in terms of the management of relationships with suppliers (SRM). The research was based on a survey study of the 62 Chinese manufacturing company top managers. The conclusion established a good and significant relationship between SRM practices and supply chain performance. Trust, commitment, communication and cooperation were found to be some of the reasons that contribute to supply chain performance. This research provides a reason to comprehend the implication of supplier relations that are effective in supply chain management. It brings out the importance of telecommunication companies in Kenya embracing effective SRM strategies in order to enhance performance in supply chain. This study proposed research was a continuation of this study since it concentrated on the specific roles of electronic procurement strategies in enlightening the overall supply chain performance within the telecommunication industry in Kenya.

RaedMasadehet al. (2022) made empirical attempt to have a case study on how supply chain integration affects supply chain performance. The researcher employed the regression analysis constructed upon the 317 valid survey responses and the quantitative research design. As per the research, there is a need of suitable supply chain integration strategies and technologies. The technological management and integration are directly relevant to the examination of the electronic procurement strategies in the telecommunication companies in Kenya. The research proposed was aimed at carrying up this study to the telecommunication sector in Kenya to examine the challenges and opportunities peculiar to the framework.

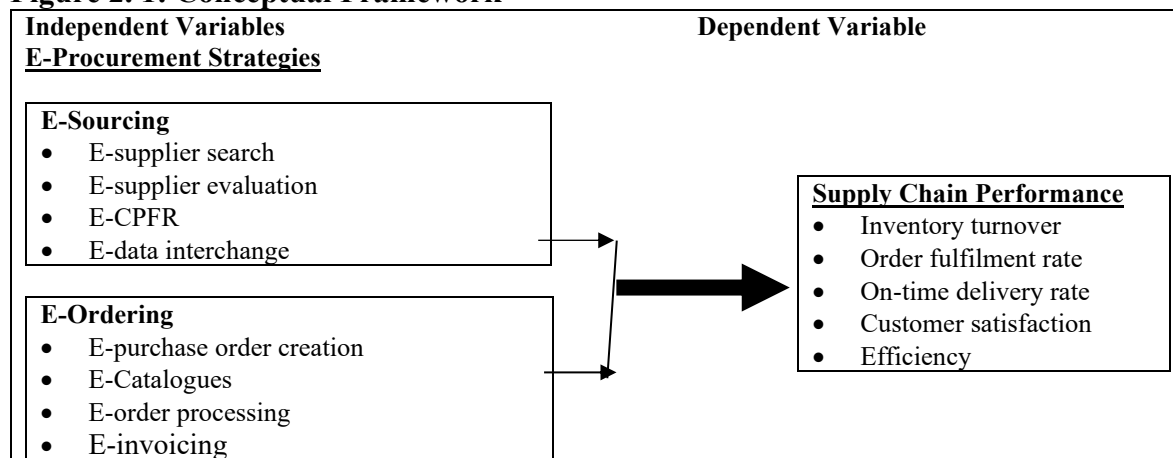
Conceptual Framework

It is a systematic diagram that shows an interrelation between several variables found in survey (Singh, 2023). It is a roadmap in the research process that helps to locate the relationship of various variables and their interaction with one another. The conceptual frameworks are frequently developed based on the overview of the literature on the studies done and could be delivered in written and visual formats (Swaen and George, 2024). It assists in organizing the research ideas and makes the research keep within the research question. A conceptual framework improves the knowledge of a research problem by illustrating the relationship through visual representation among concepts (Sabel & Yore, 2017). The developed conceptual framework proves that the survey is rooted in available knowledge and theory (Anfara& Mertz, 2014).

Figure 2.1 shows the relation between the performance of the supply chain and the e-procurement strategies. Supply chain performance is the dependent variable that varies as a result of interaction of the independent factors. The supply chain performance is the ability of a company to accomplish tasks along the value chain in order to attain outstanding results. It is the general ability and utility of the supply chain operations in the company (Christopher, 2011). It entails the different aspects such as cost, quality, delivery, flexibility and sustainability (Mentzer et al., 2010).

In the case of the study in question, the measurement of the supply chain performance by the Operational Excellence Consulting Group was adopted. Supplies chain performance, in this instance, is comprised of Inventory turnover, Perfect order fulfilment rate, On-time delivery rate, Customer Satisfaction and Efficiency. The measurement of supply chain performance that was adopted in the proposed study is that of the Operational Excellence Consulting Group (OECG) because of its multi-faceted and comprehensive nature.

Figure 2. 1: Conceptual Framework



Source: Researcher (2024)

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive and explanatory research design. Descriptive design was used to describe the extent of adoption of e-sourcing and e-ordering, while explanatory design examined their effect on supply chain performance (Creswell, 2014). The target population comprised 150 respondents drawn from 25 telecommunication firms in Kenya, including procurement managers, IT staff, and finance managers. Simple random sampling was used to select respondents. A sample of 45 respondents (30% of the population) was selected, which is considered adequate for generalization (Abutabenjeh & Jaradat, 2018).

Primary data was collected using a structured questionnaire (Kothari, 2004). The instrument was organized into sections measuring e-sourcing, e-ordering, and supply chain performance.

Content validity was ensured through expert review (Creswell & Creswell, 2017). Reliability was tested using Cronbach's alpha, with a threshold of 0.70 considered acceptable (Field, 2009). Data was collected through electronically administered questionnaires. Respondents were assured of confidentiality, and completed questionnaires were checked for completeness before analysis.

Descriptive statistics (mean, frequency, percentages, standard deviation) and inferential statistics (multiple regression) were used. The model tested the effect of e-sourcing and e-ordering on supply chain performance at a 95% confidence level:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Ethical approval was obtained, and confidentiality, anonymity, and voluntary participation were ensured

RESEARCH FINDINGS AND DISCUSSION

Forty-five (45) questionnaires were distributed to procurement managers, information technology employees and finance managers who were sampled among the twenty-five licensed telecommunication companies in Kenya. Among them, thirty-eight (38) respondents filled the questionnaires properly, and a response rate of 84.4 percent. It is good since this level of involvement is said to be very good in conducting survey research because a response rate of more than 70 percent is usually said to be satisfactory to indicate representativeness and less non-response bias (Mugenda and Mugenda, 2003). The high response rate was explained with the help of the follow-up letters and the electronic format, in which questionnaires were given, which made it more convenient and accessible to the responders.

Descriptive Analysis for the Study Variables

The following section gives the descriptive statistics on the study variables. The descriptive analysis is a summary of the responses and is used to indicate the central tendency and the degree of variation between the respondents in opinions by use of mean and standard-deviation values. Mean value gives the average degree of agreement with each statement, whereas the standard deviation (SD) describes the degree of dispersion of responses around the value of the mean.

The mean scores were further interpreted using a five-point Likert scale as follows: 1.00 -1.79 =Strongly Disagree, 1.80-2.59 = Disagree, 2.60-3.49 =Neutral, 3.50-4.19 =Agree, and 4.20-5.00 =Strongly Agree. An increased mean will indicate the greater the degree of agreement of the respondents with a certain statement or statement and the lower the standard deviation (less than one) will indicate the greater the consistency in the responses. The findings from these descriptive statistics provide an overview of how telecommunication-firm staff perceive and apply various electronic-procurement strategies, as well as how these practices influence supply-chain performance.

E-Sourcing Strategy

This section analyzed respondents' perceptions of e-sourcing practices as shown in Table 4.3. The focus was on assessing how e-sourcing has improved efficiency, transparency, cost reduction, supplier communication, supplier identification, and procurement cycle times.

Table 1: Descriptive Statistics on E-Sourcing Strategy

Statement	Mean	Standard Deviation
E-sourcing has increased efficiency in supplier evaluation and selection.	4.105	0.691
The e-sourcing process improves transparency in procurement.	4.000	0.742
E-sourcing contributes to cost reduction and budget optimization in the supply chain of telecommunications.	3.947	0.802
It improves communication between the organization and new suppliers.	3.868	0.767
E-sourcing helps organizations identify the best suppliers based on their specific needs and requirements.	4.000	0.659
The adoption of e-sourcing has shortened procurement cycle times.	3.789	0.812
By enabling the comparison of detailed information from multiple suppliers, e-sourcing helps organizations identify the best suppliers based on their specific needs and requirements.	4.132	0.688
Aggregate Mean Score	3.977	0.737

Source: Research Data (2025)

From the findings, majority of the respondents supported the view (aggregate mean = 3.977, SD = 0.737) that e-sourcing strategies have a positive impact on the performance of the supply chain of Kenyan telecommunication companies. It was found that the respondents were of strong opinion that e-sourcing helps to increase efficiency in supplier evaluation and selection (M = 4.105, SD = 0.691). This indicates that sourcing processes have been digitalized, which has made the appraisal of suppliers very easy and has increased the accuracy of procurement. On the same note, the respondents confirmed that e-sourcing enhances transparency (M = 4.000, SD = 0.742), which was to imply that the usage of online sourcing platforms has minimized bias, increased traceability and accountability in the procurement processes.

The average score on cost reduction and cost optimization (M = 3.947, SD = 0.802) indicates that e-sourcing helps to enhance financial performance through reducing the cost of transactions and administrative expenses. There is also an agreement among the respondents that e-sourcing improves the communication with the suppliers (M = 3.868, SD = 0.767), which creates more communication and better exchange of information between buyers and suppliers which leads to trust and cooperation.

Furthermore, the participants concurred that e-sourcing assists companies in finding the most suitable suppliers (M = 4.000, SD = 0.659) and that supplier data is better compared with the help of e-sourcing (M = 4.132, SD = 0.688). Such findings suggest that supplier selection based on data is easy with the help of e-sourcing tools, a factor that guarantees quality and consistency of performance. Lastly, the result that e-sourcing reduces the procurement cycle times (M = 3.789, SD = 0.812) shows that there is moderate yet a positive influence on the speed of operations and efficiency in the processes.

In general, the values of the standard deviation (0.659 to 0.812) are low, which means that the responses were similar among the participants and the answer is likely to be highly agreed upon, with the advantages of e-sourcing. The total average of 3.977 proves that e-sourcing is highly accepted and positively affected the performance of the supply chains in the telecommunication sector in Kenya. This observation is in line with Albinkhalil (2021) who established that e-sourcing is effective in terms of building supplier relations and integrations that lead to better procurement performance. Similarly, Maina (2023) showed that e-sourcing has a tremendous positive effect on efficiency and sustainability in the procurement process of Kenyan telecommunication companies, which is consistent with the outcomes of this study.

The findings also echo the Transaction Cost Theory (Benston and Smith, 1976; Williamson, 2008) that argues that organizations can engage in effective coordination mechanisms in order to reduce the cost of transactions. E-sourcing also lowers the costs of negotiations and information search and evaluation by automating searches and evaluations of suppliers and enhances governance through supplier networks. Moreover, the findings support the Resource-

Based View Theory (Wernerfelt, 1984; Barney, 1991) of the strategic resources, including e-sourcing platforms, contributing to the firm competitive advantage and improving its performance in the supply-chain. Thus, e-sourcing has become a major enabler of transparency, efficiency and low costs in the telecommunication sector in Kenya, which has contributed to agility and responsiveness in its supply chain operations.

E-Ordering Strategy

In this section, the findings of the effects of e-ordering are provided. E-ordering is the digitization of purchase orders, their creation, and monitoring with the help of an electronic procurement system. The evaluation was on the roles of e-ordering in aiding accuracy, timeliness, cost-effectiveness and product comparison in the procurement process.

Table 2: Descriptive Statistics on E-Ordering Strategy

Statement	Mean	Standard Deviation
The e-procurement platform provides access to digital supplier catalogues.	4.026	0.728
Our organization generates purchase orders electronically.	4.158	0.681
E-purchase orders improve order tracking and procurement speed.	4.105	0.705
E-ordering has led to significant cost savings in procurement.	3.921	0.796
Electronic order processing is faster and more accurate than manual methods.	4.079	0.719
The electronic ordering system ensures that orders are filled precisely and promptly.	4.000	0.742
E-catalogues make it easier to compare products, prices, and specifications.	4.132	0.688
Aggregate Mean Score	4.060	0.723

Source: Research Data (2025)

The aggregate findings (mean = 4.060, SD = 0.723) suggest agreement that e-ordering contributes immensely to supply-chain performance. The respondents agreed that this is a highly automated trend as they strongly agreed that the organization produces purchase orders in electronic format (M = 4.158, SD = 0.681), indicating the automation of the production and approval of purchase-orders. The fact that e-purchase orders enhance the speed of order tracking and procurement (M = 4.105, SD = 0.705) further proves the fact that digitization has made procurement faster.

The respondents concurred that the availability of digital supplier catalogues (M = 4.026, SD = 0.728) and ease of product comparison between products, prices and specifications using e-catalogues (M = 4.132, SD = 0.688) has improved the accuracy of decision making and evaluation of suppliers. Equally, the electronic order processing is quicker and more precise than the manual mode (M = 4.079, SD = 0.719) thus highlighting the accuracy and reliability of the automation.

Answering the questions, the respondents also admitted that the system facilitates order fulfillment in a timely manner (M = 4.000, SD = 0.742), which demonstrates that the delivery schedules are improved by instantaneity in information exchange. Lastly, cost savings of e-ordering (M = 3.921, SD = 0.796) shows some actual financial gains realized as a result of less paperwork, less human error and better coordination of procurement and suppliers.

The high mean values and relatively low standard deviations suggests agreement between the researchers that e-ordering is an efficient, timely, and accurate way of conducting the procurement process. According to Chau and Jim (2002), electronic ordering systems simplify purchasing and approving procedures and hence shorter order cycle time which is echoed in the high mean of procurement-speed improvement in the present study. The same research by Ngari (2019) found that e-catalogues in the Kenyan service organizations improved price comparison and visibility of suppliers, and therefore, sourcing accuracy and cost management.

Besides this, Odhiambo (2021) observed that the automation of order processing reduces the number of mistakes in entering data manually and enhances the trustworthiness of the supplier

relationship through real-time tracking and delivery confirmation, which is also reflected in the results of this study on the accuracy of the orders and their timely delivery. These findings are also supported by the experiences of Tipalti (2023), who found out that the use of e-ordering in telecommunication sectors contributes to procurement transparency and results in quantifiable cost savings through the integration with enterprise resource-planning systems. These studies together affirm that e-ordering is an important digital enabler that propels an efficient operation, cost control, and responsiveness of services in the telecommunication supply chains in Kenya.

Supply Chain Performance

This part provides the results (Table 4.7) of the degree of supply chain performance in Kenya among telecommunication companies. Indicators that were measured comprised the completion of orders, customer satisfaction, cost effectiveness, timely delivery, inventory management, flexibility and visibility of the supply chain.

Table 3: Descriptive Statistics on Supply Chain Performance

Statement	Mean	Standard Deviation
Our firm has a high rate of successful order completion.	3.214	0.982
Customers express satisfaction with the timeliness and quality of deliveries.	3.086	1.041
Our supply chain processes are cost-effective and resource-efficient.	2.954	1.087
Products and services are delivered on or before the promised time.	3.041	0.998
Our company effectively manages inventory to minimize excess stock.	3.003	1.023
Our supply chain can swiftly adapt to technological or customer changes.	2.887	1.114
The firm possesses a comprehensive understanding of information and product flow.	3.128	0.965
Aggregate Mean Score	3.045	1.030

Source: Research Data (2025)

From Table 3, the aggregate mean score for supply chain performance was 3.045 (SD = 1.030), indicating an overall neutral perception of supply chain effectiveness among respondents. According to the Likert scale interpretation, this suggests that supply chain performance within telecommunication firms is moderate but not strong. Successful order completion recorded a mean of 3.214 (SD = 0.982), indicating only moderate agreement that firms consistently fulfill customer orders. Customer satisfaction with timeliness and quality of delivery recorded a mean of 3.086 (SD = 1.041), suggesting inconsistency in delivery reliability across firms.

Cost-effectiveness recorded a lower mean of 2.954 (SD = 1.087), falling within the neutral range and indicating concerns regarding operational efficiency and resource utilization. Similarly, responsiveness to technological and customer changes recorded the lowest mean score of 2.887 (SD = 1.114), highlighting weaknesses in adaptability and agility within the supply chain systems. Inventory management (M = 3.003, SD = 1.023) and supply chain visibility (M = 3.128, SD = 0.965) also reflect moderate performance levels with noticeable variability among firms.

Overall, the descriptive findings indicate that telecommunication firms do not demonstrate strong supply chain performance. The neutral aggregate mean and relatively high standard deviations suggest performance gaps and inconsistencies across firms. These findings support the study's initial problem statement that supply chain performance within the sector requires improvement and justify the examination of electronic procurement strategies as potential drivers of enhanced supply chain performance.

The overall findings are consistent with Chen et al. (2020) who established that although digital procurement mechanisms improve transparency and coordination, variations in implementation capacity often result in uneven supply chain outcomes across firms. Similarly, Li et al. (2021) found that in developing country contexts, structural and operational constraints limit the full realization of supply chain efficiency despite ongoing digitization efforts. Within

the Kenyan context, Onyango et al. (2021) reported that while electronic systems enhance procurement transparency, performance outcomes remain dependent on organizational readiness and system integration. Furthermore, Ra'ed Masa'deh et al. (2022) emphasized that incomplete supply chain integration weakens responsiveness and cost efficiency, particularly in dynamic industries. These findings align with the present study's results, which demonstrate moderate performance levels and variability across firms, thereby reinforcing the need to examine the role of electronic procurement strategies in strengthening supply chain effectiveness within the Kenyan telecommunication sector.

Correlation Analysis

Correlations were evaluated by the Pearson correlation coefficient (r) whose values are between -1 and +1. A positive value means that there is a direct correlation whereas a negative value depicts an inverse correlation. Weak relationship is represented by correlation coefficients between 0.10 and 0.29, moderate relationship between 0.30 and 0.49 and strong relationship between 0.50 and above (Field, 2009).

Table 4: Correlation Matrix

Variables		Supply Chain Performance	E-Sourcing	E-Ordering
Supply Chain Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	38		
E-Sourcing	Pearson Correlation	.714**	1	
	Sig. (2-tailed)	.000		
	N	38	38	
E-Ordering	Pearson Correlation	.732**	.093	1
	Sig. (2-tailed)	.000	.123	
	N	38	38	38

Note: Correlation is significant at the 0.05 level (2-tailed).

Source: Research Data (2025)

E-sourcing was positively correlated with performance of the supply chain ($r = 0.714$, $p < 0.05$), indicating that successful digital sourcing will influence the performance of sourcing: supplier selection, transparency, and operational efficiency. This result is consistent with Nyanjala (2017) who also found that e-sourcing significantly enhances the efficiency of procurement and the cooperation level between suppliers among the Kenyan telecommunication companies, and with Albinkhalil (2021), who also identified such positive effects in Iranian manufacturing sectors.

Finally, e-ordering had the best correlation with the supply chain performance ($r = 0.732$, $p < 0.05$). This finding can be substantiated by Ghazali and Abu Bakar (2014) who have indicated that e-ordering significantly minimises lead time and improves the efficiency of communication in a Malaysian construction, but also by Ochieng (2016) whose findings showed e-ordering was effective in improving resilience and collaboration between SMEs in Kenya.

Regression Analysis

The collective and individual impacts of the four e-procurement strategies on the performance of the supply chain was examined here. To indicate the predictive relationship, multiple linear regression was used.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.858 ^a	0.736	0.715	0.412

Source: Research Data (2025)

Table 5 indicates a value of 0.858 on the R value that the e-procurement variables are strongly related to the supply chain performance. The R² of 0.736 indicates that e-sourcing, and e-ordering are combined factors and explain the 73.6 percent variation in the performance of the supply chain. The other 26.4 percent can be said to be due to other factors that are not in this model, which include competence of the supplier, infrastructure and external market conditions.

Table 6: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.981	2	6.245	22.960	0.000**
Residual	8.960	35	0.272		
Total	33.941	37			

Note: Significant at $p < 0.05$

Source: Research Data (2025)

The ANOVA also indicates that there is statistical significance in the model ($F = 22.960$, $p < 0.05$) and the overall impact of e-procurement strategies on the performance of the supply chain is significant. This confirms the appropriateness of the model in describing the differences in performance of telecommunication companies.

Table 7: Regression Coefficients

Predictor	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	0.412	0.194		2.124	0.041
E-Sourcing	0.271	0.081	0.304	3.346	0.002
E-Ordering	0.298	0.072	0.332	4.139	0.000

Note: $p < 0.05$

Source: Research Data (2025)

The fitted regression model established was:

$$\text{Supply Chain Performance} = 0.412 + 0.271(\text{E-Sourcing}) + 0.298(\text{E-Ordering})$$

According to the coefficient of e-sourcing ($\beta = 0.271$, $p = 0.002$), the increase in the supply-chain performance of one-unit, other factors remaining stable, would be 0.271 units. This shows that companies that are keen on using electronic platforms to identify, evaluate, and negotiate with suppliers record quantifiable gains in efficiency and responsiveness. E-sourcing allows telecommunication companies to have a broader pool of suppliers, less information asymmetry, and cost efficiency in sourcing. According to Kiarie (2020), these findings have been affirmed by the fact that electronic sourcing in the telecommunications industry of Kenya has enhanced the efficiency of procurement, relationships with suppliers, and shortened lead-time by a significant margin. Likewise, Mugambi and Karani (2018) discovered that e-sourcing increases the competitiveness of suppliers and accuracy of the procurement decisions, which improve the supply-chain coordination.

Lastly, e-ordering turned out to be the strongest predictor of the supply-chain performance with 0.298 coefficient ($p = 0.000$). This is because an increase of one unit in e-ordering practices will result in a 0.298-unit increase in the supply-chain performance, other things being equal. This positive influence is high indicating the need to have automated ordering system to facilitate the process of requisitions, approvals and tracking orders. When using e-ordering, companies are able to ease paperwork, speed up communication and increase the accuracy of data in procurement and logistics departments. These results are consistent with the results reported by Muli (2022), who concluded that e-ordering had a tremendous positive impact on procurement efficiency, accuracy of data, and cooperation with suppliers in Kenyan service organizations. Similarly, Ghazali and Abu Bakar (2014) have also shown that e-ordering has improved on order tracking and reduced processing errors in Malaysian construction companies and have highlighted its effects on operational reliability and performance.

Conclusions

Regarding the first research question on the influence of e-sourcing strategies, the study concludes that e-sourcing has a positive and statistically significant effect on supply chain performance. The findings indicate that the use of digital supplier search, evaluation platforms, and electronic data exchange enhances structured decision-making, improves supplier selection efficiency, and strengthens alignment between sourcing activities and organizational objectives. Therefore, increased adoption of e-sourcing contributes to improved coordination and operational effectiveness within the supply chain.

With respect to the fourth research question on e-ordering strategies, the study concludes that e-ordering exerts the strongest positive influence on supply chain performance. Automation of order processing reduces lead times, minimizes errors, and enhances information accuracy. Integration of e-ordering systems with enterprise resource planning systems improves coordination, tracking, and communication across departments and suppliers. Therefore, e-ordering plays a central role in improving timeliness, reliability, and overall supply chain effectiveness.

Contribution to Knowledge

The study fills one of the most significant gaps in knowledge because it empirically shows that the individual and combined use of certain e-procurement elements, improve the performance of operations, transparency, and the final results of the supply chain. In contrast to the previous research conducted in Kenya that considered e-procurement as one and the same phenomenon, this study is able to distinguish the influence of each strategy, which presents a more detailed perspective on the role of each and a combination of these strategies. The disaggregated approach also contributes to the current theory by demonstrating that performance advantages related to e-procurement are achieved due to the complimentary nature of its components and not specific to the operation of one tool.

In a methodological perspective, the research is valuable since it uses a strong quantitative model, which combines descriptive, correlational and regression studies, to confirm the predictive impact of e-procurement strategies on the performance of the supply chain. This triple methodology increases the robustness and extrapolability of the results to other related industries in emerging markets based on services. The application of primary data that is based on various managerial levels of the licensed telecommunication companies also complements the empirical evidence base on the technology-driven procurement transformation in Kenya. The results show that despite the limited resources, a systematic implementation of digital procurement systems can achieve a significant efficiency improvement and organizational nimbleness.

In practice, the research asserts that e-ordering is the most effective predictor of the performance of supply chain. This knowledge gives decision-makers a clear area of priority on which to invest in the event of desiring immediate performance improvement. Further, the evidence presented in the study provides the policy makers with a way to reinforce the procurement governance structures. The research proves to have practical implications by validating that integrated e-procurement systems can positively affect both operational performance and ethical practices by ensuring that firms endeavor to align digital change with their sustainability and compliance goals. On the whole, this research contributes to the expanding corpus of literature that considers e-procurement as both an operational instrument and a competitive advantage and institutionalizing factor of the contemporary supply chain management.

Policy Recommendations

The paper gives a good indication that the implementation of the electronic procurement strategies improves the performance of the supply chain significantly in the Kenyan

telecommunication industry. On the basis of the findings, some policy-level recommendations are possible. To begin with, regulatory bodies like the Communications Authority of Kenya and the Public Procurement Regulatory Authority ought to come up with standard e-procurement systems that can inform technology adoption, data integration and digital compliance within the industry. This software would provide uniformity in procurement automation and would assist smaller companies to become digitalized without both technical and financial drawbacks.

Second, the policymakers ought to enhance development of an enabling climate of digital procurement infrastructure by way of favorable legislation and fiscal provisions. Tax credits or subsidies might be offered to make companies invest in e-procurement solutions, cybercrime protection strategies, and capacity-building programs of their staff. This would speed up the adoption throughout the country and standardize the exchange of data between the suppliers and the telecommunication companies to enhance transparency and accountability in the transactions between the public and the telecommunication firms.

Lastly, the national ICT policies need to be extended to the digital procurement as one of the components of industrial efficiency and competitiveness. When e-procurement becomes part of the larger digital transformation agenda in Kenya, the corporate procurement practices would be in line with the national development agenda like efficiency, innovation, and reducing corruption. Enhancement of its digital literacy initiatives and interoperability among the electronic procurement systems would also serve to further promote a transparent and technology-driven procurement ecosystem in which all the stakeholders, including suppliers and regulators, perform.

Managerial and Practice Recommendations

In the organizational level, the study suggests that e-procurement practices should be institutionalized as a strategic operation in the telecommunication firms. The managers need to emphasize on integrating the e-ordering systems with enterprise resource planning (ERP) tools so as to stream purchase requisitions, approvals, and tracking. As e-ordering was recognized as the strongest force behind the performance, companies must invest in the further development of the system and the automation capabilities, which do not require human intervention and introduce bottlenecks. Also, real-time analytics and online dashboards must be implemented to track procurement patterns, assess performance of suppliers, and increase the precision of decision-making.

Suggestions for Further Studies

The research has attributed 73.6 percent of the differences in supply chain performance with the remaining 26.4 percent not explained by the e-procurement strategies studied. Subsequent studies must thus focus on other issues like supplier competence, technological infrastructure, regulatory frameworks as well as the culture of an organization which might also affect the result of the supply chain. The moderating or mediating variables such as firm size, digital preparedness and leadership commitment can also be investigated in future to gain a deeper insight into the circumstances in which e-procurement can achieve the best results. It would also be useful to extend the study to other industries or adopt longitudinal and qualitative research designs.

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