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Influence of E-Procurement on Supply Chain Performance of Safaricom Limited Company: Greater Western and Rift Region in Kenya

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Abstract:

The president of the Republic of Kenya launched E-procurement system on 13th August 2014 in order to increase transparency, accountability and to enhance prudent use of public resources that results to quality services and value for money. Safaricom Limited Company has continued to face tough competition from its competitors as well as the need to digitalize its E-procurement systems to for quick decision making for competitive advantage. This is due to conflict of interest, poor record keeping, inadequate transparency and accountability, transaction inefficiencies, delays in deliveries and collusion with suppliers. The specific objective of the study was to establish the influence of e-procurement on supply chain performance of Safaricom Limited Company. The study considered e-tendering, e-sourcing, e-invoicing and e-ordering as the independent variable. The study adopted descriptive research design and case study strategy. The population targeted managerial and non-managerial (Customer Service Agents) staffs from supply chain department, finance departments and IT department of Safaricom Limited Company. The study however was limited to Safaricom Retail Shops in Greater Western and Rift Region. The target population was 150 workers. A sample size of 109 employees was used in the study. Stratified random sampling was used to determine the sample size. The study used questionnaire to collect primary data. Both descriptive and inferential statistics was used to analyze data and test hypothesis of the relationship. The data was then processed by the use of Statistical Package for Social Sciences (SPSS 25.0). Multiple regression analysis and correlation analysis was used to measure the relationship between independent and dependent variable. The study established that E-tendering processing practice enhances supply chain performance positively. It is recommended that management should ensure that all modules from purchasing Requisition, Quotation/tenders, request for proposals, purchasing order approvals and Transmission, contract monitoring, Goods receipt note. This will reduce tender processing time, eliminate postal, printing & storage costs, wide supplier base will be achieved and audit trails will be maintained thus reduction of corruption. The study concludes that e-sourcing had a significant effect on supply chain performance of Safaricom Limited Company. From the study established that E-sourcing practice enhanced supply chain performance by Stocks being managed by application of MRP, EOQ, stock aging, stock location, receiving, issuing stocks and stock reports electronically. It is recommended that application of Bar codes should be improved to improve receipts and issues of stocks. It is recommended that management should ensure working Websites, working internal and External mail to improve supplier and buyer's integration. To improve buyer/supplier relationship in time electronic payment to suppliers is necessary. The study concludes that e-invoicing has a significant impact on supply chain performance of Safaricom Limited Company. Though, both sender and receiver are free to choose their operators to exchange digital invoices since it's not a must for parties to choose same e-invoice operators for exchanging their digital invoices, the study notes that e-invoicing promotes security and improved relationship with supplier. This implies that an improvement in e-invoicing would lead to an improvement in supply chain performance. The study also found out that E-ordering processing practice enhances supply chain performance. It is recommended that in order to achieve maximum benefits of reduced order processing time, reduced costs, reduced human errors and improved delivery, management should enhance electronic system and insist on all orders being processed electronically.

Keywords: E-tendering, e-procurement, supply chain, e-sourcing, e-business

1. Introduction

1.1. Background of the Study

Due to high competition in today's market environment, managers of various entities are forced to plan their supply chain activities to ensure that they save on the cost in order to achieve efficiency. Therefore, it is important that any strategy introduced in the organization should focus on the identified objectives so as to gain approval from individuals

during the entire supply chain exercise. Moreover, the strategy should aim at cost reduction and customer delivery improvement (Kituzi, 2016).

The concept of internet technology has become a priority in a modern worldwide business environment which results to a highly competitive advantage. This is due to increasing trend towards purchasing inputs and other raw materials from outside the organization in an efficient and effective manner. Companies are conscious of the needs to introduce Internet-based technologies in their order process, due to the benefits of saving transaction cost, increasing competitive sourcing opportunities, and enhancing inter-organizational coordination (Nafuna & Namusonge, 2017).

The rise of E-business was in the late 1990's through the proliferation of the Internet as a platform for inter-organizational systems (IOS) and has had a particularly significant impact on supply chains and networks (Croom & Jones, 2005). The use of internet technology in supply chain has had a positive outcome during the entire procurement process hence a preferred mode of doing business. Amemba, Nyaboke, Osoro and Mburu (2013) noted that public agencies must utilize information technology in order to enhance the procurement processes in the public sector. According to Ngeera (2016), E-procurement uses information technology in managing the procurement process in the organization with an aim of improving the entire procurement process. Croom and Jones (2005) argue that procurement process involves the initial need identification and specification by users, through the search, sourcing and negotiation stage of contracts and order placement and on to include mechanisms that register receipt, trigger payment and support post-supply evaluation.

1.1.1. E- Procurement

According to Ndiiri (2016), E-procurement and the use of computers has made business world to move very fast. E-procurement entails acquisition by purchase, rental, lease, hire purchase, license, tenancy, franchise or by any other contractual means of any type of works, assets, services or goods including livestock or any other combination by a procuring entity electronically (Njagi & Kinoti, 2017). Songok (2018) indicates that E-procurement is believed to be the solution to the inefficiencies caused by the traditional purchasing methods which were time consuming and costly. Moreover, E-procurement encompasses the use of software to manage and execute procurement functions and creates interfaces that enable fast & cost friendly execution of activities. For instant tendering, catalogues generation and management, supplier contracting, supplier management and general communication.

E-procurement acts as an integrative technology that enables integration and improvement of processes between departments. Kituzi (2016) citing Flynn, Huo, and Xhao (2010) define internal integration as the degree to which two departments collaborate in the management of both inter and intra departmental processes to provide maximum value for the firm. Ngeera (2016) cites that public procurement has considered E-procurement as one of the major reforms. This is due to many benefits it offers hence the concept is accepted in the business environment. E-procurement has a variety of benefits, namely, cost reduction, quality improvement, increase in competitive effect, increasing transparency and time saving (Svidronova & Mikus, 2015). E-procurement can be in form of e-tendering, e-marketing, e-auction/ Reverse auction, e-catalogue/purchasing, e-invoicing, e-ordering etc. Nevertheless, there are three types of procurement systems: Buyer e-procurement systems, seller e-procurement systems and online intermediaries (Tsuma & Kanda, 2017). For the organizations to achieve successful implementation of any IT-system and achieve its benefits, top management support, organizational adaptation, and training of employees should be enacted. However, despite the adoption of e-procurement by many firms in an attempt to achieve the proposed benefits of lower costs and improved efficiency, it should be noted that the use of e-procurement does not guarantee positive outcomes for buyers or suppliers (Kioko & Mwangangi, 2017). The introduction of technology has promoted global implementation of E-procurement. The United Nations Expert Group (2011) ascertained that E-procurement has been a common theme of many organizations for the promotion of transparency and good governance in procurement for many developed and developing nations. They further indicate that countries with a well implemented system have noticed higher participation of SMEs (Small and Medium) due to improved market access and a reduction in marketing costs. For instant, a country like Korea is seen as a leader with the implementation of a fully integrated e-procurement solution that is integrated with all other electronic government operations, including financial management systems, company registrations and tax systems.

The report further articulates that in the Philippines, the e-procurement initiative has focused more on e-tendering with the initial objective to improve transparency, open access and competition. Furthermore, since 2001, the Philippine Government Electronic Procurement System (PhilGEPS) has served as the central procurement portal for all government procurement activity for goods, services and works. The system started as a pilot service with a few agencies and participating suppliers while the government began to initiate a procurement reform program that included a new procurement law instituting the use of PhilGEPS as the official procurement portal for all government procurement. A report by OECD (2017) indicates that OECD countries are expanding their e-procurement systems through implementation of additional functionalities on the platforms and integration of the system with other e-government technologies to further enjoy the benefits of digitalizing the public procurement cycle. In which 29 countries announce tenders and notify contract awards on their national central e-procurement systems. Nevertheless, tender documents are also provided on national central e-procurement systems in (26 countries). The report further indicates that half of the OECD countries (15 countries), purchasing authorities at the sub central level use central e-procurement systems as well and that national central e-procurement platforms in 21 countries provide electronic submission of bids, but fewer countries do so for e-reverse auctions (11 countries). However, only 10 OECD countries (33%), including Estonia, Finland Korea and Portugal, measure efficiencies generated by the use of e-procurement system, focusing on diverse sources of efficiency, including savings in terms of time and transaction costs. electronic submission of invoices (10 countries) and online catalogues (11 countries). The government of Kenya launched e-procurement system in the year 2014 with the aim of promoting openness and accountability in the use of public money. Rotich and Okello (2015) note that since Jubilee

government came into power, Kenya has faced a lot of pressure and reforms to ensure that public procurement functions are conducted online. The study reveals that the government introduced integrated financial management information system (IFMIS) in order to improve governance by providing real time financial information and effectively programs.

1.1.2. Supply Chain Performance

Supply chain function is an important element in every organization. The key elements of supply chain function are process and people which need to be managed in order to fulfill customer's requirements. Supply chain involves all the activities concern with the transformation of raw materials into finished goods, flow to the end user and flow of information (Nyagah & Mwangangi, 2015)

Mwongela (2014) asserts that for organizations to maximize competitive advantage, they must have comprehensive visibility into supply chain performance. Supply chain performance is the process of quantifying the effectiveness and efficiency of an action to achieve operational excellence in order to deliver leading customer experience. Supply chain performance enables firms to drive rapid change in all aspects of nearly all operations, thus, effective supply chain mastery is a critical factor to achieving high performance. Chirchir, Ngeno and Chepkwony (2015) argue that to proactively manage the overall performance of supply chains, firms need to know more than inventory positions, deliveries dates, and fill rates. More so, they must understand the impact of supply chain changes on the total cost or cash flow and optimize supply chain effectiveness for better corporate results. For supply chain performance to improve, it has to be more agile in order to react to short term changes quickly. Supply chain performance can be achieved when there is efficiency in flow of product, delivery performance, order fulfillment lead time, supply chain responsiveness, production flexibility, and inventory cost, better discounts among others which result to improved quality, cost reduction and shorter lead time (Nyagah & Mwangangi, 2015). A study by Kituzi (2016) found out that e-procurement has a significant influence to both the supplier and buyer. The benefits they encounter include shorter procurement cycles, reduced inventory levels, lower transaction costs, higher degree of transparency and increased communication between supplier and buyer organizations. However, if a procurement function becomes reluctant on adopting e-procurement or uses the traditional procurement procedures, it will cause poor procurement performance hence inefficiencies and wastage of cost shall be encountered.

Safaricom Public Limited Company Safaricom Ltd is a leading mobile network operator in Kenya. Its headquarters are located in Safaricom House, Waiyaki, Nairobi. Safaricom PLC is an integrated communication company providing voice, data and financial (mobile money) products and services to consumers, businesses and public sector clients. It was formed in 1997 as a fully owned subsidiary of Telkom Kenya. It started as a department of the former state-owned Kenya Posts & Telecommunications Corporation, initially launching its operations in 1993. In May 2000, Vodafone group Plc of the United Kingdom, the world's largest telecommunication company, acquired a 40 per cent stake and management responsibility for the company. The state corporation Telkom Kenya acquired a 60 per cent stake in Safaricom by contributing its GSM networks together with a customer base valued at 25.7 million as at December 2018. However, Telkom Kenya Ltd (December 2007), divested of Government of Kenya's 25 per cent stake in Safaricom Ltd through a public listing (May 2008). Similarly, Vodafone Kenya Limited acquired a 40 per cent interest in Safaricom (Safaricom, 2014). According to Macharia (2014), the company was the first one to develop a mobile phone-based money transfer service (M-Pesa) and implements best practices in procurement.

1.2. Statement of the Problem

E-procurement system was launched by the president of the Republic of Kenya on 13th August 2014 in order to increase transparency, accountability and to enhance prudent use of public resources that results to quality services and value for money. Nevertheless, the use of e-procurement system in public institutions has been noted to be 44.2% (Economic survey, 2018). However, public procurement is still vulnerable to corruption which adversely affects the overall performance of a firm. Despite, Safaricom Limited Company being a leading mobile network operator in Kenya, it has many times experienced tough competition from its competitors. Additionally, the company has continued to encounter challenges on how to improve its competitive position in the industry of telecommunication. Correspondingly, Macharia (2014) reveals that Safaricom Limited experience challenges in relation to their service delivery. This due to conflict of interest, poor record keeping, inadequate transparency and accountability, transaction inefficiencies, delays in deliveries and collusion with suppliers (Njagi & Kinoti, 2017).

A number of studies have been conducted on e-procurement. Ndunge (2016) carried out a research on e-procurement and performance of government ministries in Kenya. Findings from the study show that government ministries adopt specific e-procurement procedures in the administration of their operations which creates competitive power in the same government departments by concentrating on efficiency and effectiveness. The study concludes that e-procurement practices being adopted face various challenges which hinder the effectiveness implementation and adoption process.

Barngetuny and Kimutai (2015) researched on effects of e-procurement on supply chain management performance in Elgeyo Marakwet county government. The study revealed that lack of an E-procurement system leads to payments delays. Ng'ang'a (2017) studied the impact of e-procurement on the operational performance of parastatals in the ministry of energy and petroleum in Kenya and noted that all parastatals in the ministry have adopted e-procurement. The study points out the need for serious commitment in providing staff with the necessary competencies and skills for success implementation. Otieno and Achuora (2018) examined the influence of e-procurement on performance of food and beverage firms in Nairobi county, Kenya. Their findings concluded that electronic payments, electronic contracting,

electronic mailing and electronic ordering have a positive relationship with performance of food and beverage firms. Barasa, Namusonge and Okwaro (2017) revealed that e-procurement helps businesses to do well at the micro level and thus having a lot of implications on the economy and the Gross Domestic Product at the national level. A study by Shukla, Khan and Shah (2016) identified the key barriers in adoption of e-procurement which included organizational, technical and legal aspects. The study further note the drivers in adoption of e-procurement which were transaction and administration cost saving, reduce time, more transparency, improved communication between suppliers and buyers. Kayungi (2013) explained that manual procurement system is considered inadequate for construction industry in Tanzania due to lack of transparency wastage of time and money. From the previous empirical studies, it is clear that most of them have not exhaustively investigated the influence of e-procurement on supply chain performance of Safaricom Limited Company. It's from this background that this study seeks to cover the research gap by establishing the influence of e-procurement on supply chain performance of Safaricom Limited Company.

1.3. Objectives of the Study

The study was guided by a general objective, specific objectives and research hypotheses as stipulated below.

1.3.1. General Objective

To establish the influence of E-procurement on supply chain performance of Safaricom Limited Company.

1.3.2. Specific Objectives

- To assess the influence of e-tendering on supply chain performance of Safaricom Limited Company.
- To establish the influence of e-sourcing on supply chain performance of Safaricom Limited Company.
- To determine the influence of e-invoicing on supply chain performance of Safaricom Limited Company.
- To examine the influence of e-ordering on supply performance of Safaricom Limited Company.

1.4. Research Hypothesis

- H01: There is no significant influence of e-tendering on supply chain performance of Safaricom Limited Company.
- H02: There is no significant influence of e-sourcing on supply chain performance of Safaricom Limited Company.
- H03: There is no significant influence of e-invoicing on supply chain performance of Safaricom Limited Company.
- H04: There is no significant influence of e-ordering on supply chain performance of Safaricom Limited Company.

1.5. Justification of the Study

Safaricom PLC's digital platforms and E-procurement strategies are meant to serve its internal and external customers with ease of access and as a cost cutting measure to achieving value for money. One of the strategies that the Safaricom has implemented is E-procurement. Empirical studies have not exhaustively tackled e-procurement on supply chain performance of Safaricom Limited Company. For this reason, the study examined the influence of E-procurement on supply chain performance of Safaricom Limited Company. The study will be of benefit to both the Telecommunication companies and Kenyan government. They shall obtain best bidders and perform procurement process more efficiently. Not only government will benefit but also State Corporation. They shall ensure that procurement process is done in a transparent manner. Buyers and suppliers from different firms too will acquire value from this study. Buyers shall be able to send request for quotations to suppliers more easily while suppliers will be able to specify prices. Finally, to supply chain and procurement academicians and researchers shall use this study during for reference.

1.6. Scope of the Study

The study focused on Safaricom Limited Company Greater Western and Rift Region. This is because Safaricom experience tough competition from its competitors despite having e-procurement systems in place. The aim of the study was to examine the influence of e-procurement practices on supply chain performance in Safaricom. The study looked on how independent variable (E-procurement) is linked to dependent variable (supply chain performance). The study focused on four E-procurement practices; e-tendering, e-sourcing, e-invoicing and e-ordering. Respondent to the research questions were procurement staff from Safaricom Greater Western and Rift Region.

1.7. Limitation of the Study

Time was a limiting factor since some of the Shops in Greater Western and Rift region in Safaricom Limited are located in the far-off towns. However, this was overcome by assigning research assistants' specific areas of supply chain and inventory operations. Another challenge were the available resources within which to complete the study, particularly given the study scope and quality of work expected by the university. The study however sourced enough funds from family and friends before commencing the research. The funds were used to meet the research budget. These limitations did not impair the study results. Extra caution was taken to avert and minimize, as far as possible, the potential effects of these limitations.

2. Literature Review

2.1. Introduction

This chapter reviews relevant theoretical and empirical literature on E-procurement on supply chain performance. It also attempts to establish relationship between independent and dependent variable. The chapter further develops conceptual framework. It also critique's existing literature and identifies research gaps.

2.2. Theoretical Framework

The study was guided by four theories. These include: Technological Acceptance theory, Resource Based theory, Innovation Diffusion theory and Transaction Cost theory. According to Grant and Osanloo (2014), theoretical framework is the blueprint for the entire dissertation inquiry. It serves as the guide on which to build and support your study, and also provides the structure to define how you will philosophically, epistemologically, methodologically, and analytically approach the dissertation as a whole.

2.2.1. Technology Acceptance Theory

Technology acceptance theory was developed by Davis in the year 1989. Surendran (2012) argue that TAM predicts the use and acceptance of information systems and technology by individual users. Usefulness is the degree to which the use of computers enhances someone's performance, for instant, improved performance, enhanced productivity, effectiveness and efficiency in operations (Rotich & Okello, 2015) For the acceptance of information systems and technology, administrators need to analyze the attitude the employees in order to prevent implementation failures and poor utilization of the resources (Ng'ang'a, 2017). It can also be viewed as perceived ease of use of the new systems such as ease to learn, ease to use, ease to control and ease to remember. TAM examines the individual technology acceptance behavior in different information systems constructs.

Rotich and Okello (2015) argue that adoption of information technology requires investment in computer-based tools to support decision making and planning communication. Nevertheless, there is a need to understand that people may resist technological changes. It is therefore, a requirement that one must understand why people resist changes and the possible ways through which such issues can be resolved. Ndiiri (2016) while quoting Davis (1986) assert that technological advancements will not enhance the effectiveness and performance within an organization if their users have not embraced change. E-Procurement adoption can greatly impact the procurement operations of a firm. Osir (2016) points out that ordering process which involves tasks like: order preparation, order approval and order transmission to the supplier can be undergo the changes. The researcher further argues that the perception of employees and suppliers on the usefulness and ease of use of e-procurement system is very critical in realizing full benefits of e-procurement adoption; especially in the implementation of e-ordering. The study therefore adopted this theory to determine the influence of e-ordering on supply chain performance of Safaricom Limited Company.

2.2.2. Innovation Diffusion Theory

The theory was proposed by Rogers (1962) which presents that innovation is a process aimed to improve economic development. This theory is also known as diffusion of innovation theory which is defined as an idea perceived as new by individuals. Osir (2016) theory is typically based on perception of the characteristics of the technology, and the user's perception of the system. This theory categorizes adopters of innovation into five categories; Innovators, Early Adopters, Early Majority, Late Majority and laggards. Rotich and Okello (2015), innovators are individuals who want to be the first to try the innovation, Early Adopters, people who represent opinion leaders, Early Majority individuals who need to see evidence that the innovation works before they can adopt it, Late Majority, skeptical individuals who only adopts an innovation after it has been tried by the majority and Laggards, individuals who are very skeptical of change and are the hardest group to involve in the innovation process.

Their study further cites that rate of adoption of innovative strategies is determined by some elements. First, it is determined by relative advantage given to the organization, compatibility, complexity, trial-ability of the new strategies and observability to the stakeholders within the social system. Secondly, communication that lays information and creates information sharing relating to innovative initiatives in the organization. Last but not least time that considers the duration involved in the innovation-decision process and the context of the new systems. Osir (2016) while quoting Rogers (2010) asserts that the main elements influencing the spread of a new technology include: the innovation itself, communication channels, time, and a social system. The study further depicts that this element has direct impact on e-tendering adoption success among both buyers and bidders since it requires the following activities to be conducted: electronic advertisement of tender to the public, electronic transmission of bid documents to renderers for filling in and electronic submissions of bid documents by tenderers. This theory is therefore important in analyzing the influence of e-tendering on supply chain performance of Safaricom Limited Company.

2.2.3. Resource Based Theory

This theory was advanced by Prahalad and Hamel (1990). It focuses on internal organizational capabilities of an entity which enables achievement of higher performance. Its concept argues that the resources internal to the firm are sources of competitive advantage.

Such resources are valuable in such a manner that they are rare, inimitable and difficult to substitute (Nafuna & Namusonge, 2017). A firm that uses its valuable resources should utilize opportunities to reduce the existing threats from the external environment. This means that internal capacity of an organization means a lot. In addition, technological

innovation frameworks are resources that lead to improved service delivery and performance (Ng'ang'a, 2017). When a firm allocates its resources more efficiently they achieve greater performance (Kalau, 2016).

Firm's resources go beyond finances and materials to encompass methods and processes.

Ndunge (2016) cited Baily (2008), resource-based theory analyses the sources and sustainability of Information Technology. The researcher asserts that e-procurement is an approach that optimizes use of available resources to enhance efficiency and effectiveness in procurement and hence deliver a competitive advantage in terms of improved lead times, cost efficiency and customer satisfaction.

Resource based view is considered as contributive and significant to the decisions of sourcing. If an organization lacks the resources and capabilities needed to perform these activities internally, they can be outsourced to external suppliers of the firm. Through sourcing, specialized knowledge is acquired which facilitates competitive advantage thus achieving lower cost positions or higher levels of differentiation than competitors. The adoption of E-procurement enhances e-sourcing in a transparent way. This theory will be of importance in analysis the influence of e-sourcing on supply chain performance of Safaricom Limited Company.

2.2.4. Transaction Cost Theory.

Performing business by the use of technology reduces transaction costs in supply management (Kähkönen, Lintukangas and Virolainen, 2013). The assumptions TCT rests upon human behavior and environmental characteristics. These assumptions clearly explain why firms may face superior costs for market-based transactions and why firms may be relatively more efficient than markets at organizing transactions. The firm is required to select the governance form in order to that minimizes transaction and production costs (Rodrigo, Serra, Leite, Ferreira & Li, 2010). Chipiro (2009) quoting Williamson (1989), transaction cost theory predicts that as environmental uncertainty and speed of transactions between companies increase, vertical integration is preferred in order to reduce transaction costs. These costs include cost associated with negotiating, implementing, coordinating, monitoring, adjusting, enforcing and terminating exchange agreements. Chipiro (2009) further reports that internet generates savings and is an effective way to reduce high transaction costs for low-value items such as maintenance, repair, and operating items. More so, internet reduces prices paid for purchased goods/services.

During procurement of goods and services, transaction cost can either increase or reduce. Wagner and Essig (2006) argues that internet inclines the transaction cost curve of markets and makes markets the cost-optimal governance structure for a wider range of specificity.

Stephens and Valverde (2013) note that there is e-procurement reduces transaction costs since there is minimal poor invoice checks / matching. This theory will be used to examine the influence of e- invoicing on supply chain performance of Safaricom Limited Company.

2.3. Empirical Review

E-procurement is the purchase and sale of supplies, work and services through the internet as well as other information and networking systems, such as Electronic Data Interchange and Enterprise Resource Planning. It may be in the form of B-2-B or B-2-C or B-2-G. E-procurement is a technology that allows companies to focus on customer needs and expectations (Farzin & Nezhad, 2010). In a broadly perspective, e-procurement includes a company's requisitioning, purchasing, transportation, warehousing and in-bound receiving process. It gives solutions to buyers or employees to order goods directly from the personal computers through the web in real time. Empirical studies show that organizations are spending as much as 50 to 60% of total revenue on e-procurement activities (Stephens & Valverde, 2013). More so, using e-procurement can reduce cost per transaction by 65% (Inder and Punia, 2011)

Bakar, Peszynski, Azizan and Sundram (2016), E-procurement activities include advertising tenders, submitting tenders electronically, electronic ordering, internet sourcing via third parties, email communications between buyers and sellers, email communications related to contract management, and the integration of procurement within financial and inventory systems. Furthermore, their study asserts that E-procurement is about enhancing collaboration, streamlining business processes, controlling costs and enhancing information exchange within and across an organization's boundaries.

2.3.1. E-tendering and Supply Chain Performance

Sarker, Chowdury, and Deb (2012) reveals that appropriate tender selection ensures a smooth delivery process and eliminate several complexities during construction. The researchers proposed the need for tender evaluation system and decision support system in order to improve tender assessment process as well as finding the relative importance ranking of basic criteria of best tender which help the decision maker to evaluate the best tender more precisely. Their study further shows that the implementation of E-GP can save public money and erase political influence from bidding. The idea of a virtual bidding process could also save more than 15% of the government's procurement costs. According to Kagai (2013) e-tendering is a process of sending RFI (request for information) and RFP (request for proposal) to suppliers and receiving their response using internet technologies. E-tendering offers broad benefits, which includes; price reduction due to reduced paper work, postage fee and other cost associated with preparation and sending of tender documents. More so, it is fast since documents are sent electronically and the time wasted while looking for potential suppliers is reduced time wasted (Barngatuny & Kimutai, 2015). Rotich, Muma, Waruguru (2015) while quoting CIPS (2006) note that e-tendering has benefits which include; improved process efficiency, reduced overhead costs, enhanced transparency and accountability in the procurement function, reduced ordering and holding costs, reduced paperwork, improved cash flow and reduced cost associated with credit control. It was also established that e-tendering practice has

enabled faster submissions of tender documents by prospective suppliers therefore shortening the tender cycle period and cost associated during tender process.

A study by Fernandes and Vieira (2015) on public e-procurement impacts in small- and medium-enterprises note that tenders did electronically maximums the number of suppliers competing. In addition, it is revealed that e-procurement leads to tenders increased value and transparency. However, the researcher argues that legal constraints that arise for instant, the interpretation of the new legal framework may affect the e-procurement adoption. Candra and Gunawan (2016) point out that tender selection of goods and services done online help the process to be effective, efficient and transparent. A research conducted by Nawi, Roslan, Salleh, Zulhumadi and Harun (2016) reveals that the Malaysian government implements e-procurement system and online tendering which streamlines government activities and helps improve the quality of services. The study concludes that business communications, business process, cost reduction and cycle time, exploration of new markets and business opportunities, increase transparency in contracts, and overall competitiveness, are major and pertinent areas to be given more focus in improving the e-procurement system in government agencies. Moturi (2016) researched on e-procurement implementation and performance of commercial state corporations in Kenya. The study adopted descriptive survey design whereby a target population of 54 state corporations was used. It was concluded that online tender advertisement has led to credibility, service delivery and reduction of supply chain costs. According to Wariga (2017), e-tendering means the use of web-based technology in sending invoice & purchases request to the suppliers. More so, supplier's responses are received online as part of e-tendering process. In addition, transactions are done online by buyers and sellers and documents are exchanged easily. Watuleke (2017) points out that electronic bid can take place using a centralized server approach and or an interconnected server approach for localized markets. In which central server displays the item to be sold, announcing the deadline for placing bids in which bidders access the server for bid placements and it is their responsibility to ensure that their bids get to the server before the deadline. Nevertheless, the study shows that internet-supported bid have features like: instant electronic bid/quote and Request for Proposal (RFP) notification based on „areas of interest“; online retrieval of bids, quotes and RFP"s; locked repository for compliance of „sealed bid“ requirements; online publication and notification of bid/quote and RFP awards. Munyai and Moronge (2018) established the influence of e-tendering on the performance of procurement in public universities in Kenya. From the findings, e-evaluation has been adopted to a high extent among the public universities as shown by a response of 66.6% while e-awarding has been adopted to a small extent as shown by a response of 40%. Furthermore, e-tendering has been adopted to a moderate extent among public universities although e-evaluation has been adopted to a high extent and e-awarding has been adopted to a small extent.

2.3.2. E-sourcing and Supply Chain Performance

Stephens and Valverde (2013) conducted a study on the security of e-procurement transactions in supply chain reengineering. As per the researchers, system responsiveness affects the allocation of alternative sources if necessary, depending on the needs of the users. Kariuki (2013) cites that e-procurement is a major part of SCM in standard chartered bank of Kenya since sourcing, control and reporting is done through the system. The study recommends that for SCBK to achieve higher functionality there is need to move from intranet to internet technology to enable collaboration with suppliers. A study by Kamarulzamana and Mohamed (2013) on application of e-procurement technologies for selecting suppliers of agro-based SMEs in Malaysia indicated that e-catalogue is an innovative digital medium in which information about products and services may be placed within an executable file that can be distributed by email or made downloadable from a website. In addition, e-catalogue does not require any other software to run it and offers enormous benefits for businesses that communicate with internal and external customers via the Internet or an Intranet. E-procurement also facilitates integrating multiple supplier catalogues into a single buyer-managed view of catalogue. Kim, Suresh and Kocabasoglu-Hillmer (2015) analyzed the impact of strategic sourcing and e-procurement on performance. The study concluded that strategic sourcing and e-procurement make a positive impact on the performance and e-procurement positively effects on strategic sourcing. Kimutai and Ismael (2016) established the role of strategic sourcing practices on supply chain performance in state corporations, a case of Kenya electricity generating company ltd. The study cites that strategic e-sourcing create value by lowering cost, streamlining processes and enabling development of new businesses. The findings indicated that e-sourcing creates efficiency. Furthermore, the company utilizes online systems like E-catalogues, E-auctions and supplier Portals. Rotich, Muma and Micheni (2016) citing Aberdeen Group, reported by Best Practice

Network (2004) reveals that a well-managed sourcing process should prioritize organizational requirements, understand supply market, select the supplier best placed in satisfying organizational needs, negotiate for the best overall value, establish and manage relationships with suppliers, develop cost reduction strategies and enhance long term performance of the purchasing operations and in turn the procurement performance. The study further indicates that there is a relationship between e-sourcing and procurement performance of county governments in Kenya. It also recommends should be done every procurement cycle and that databases should be created on online suppliers in order to make them more traceable. Wariga (2017), defines e-sourcing as the application of internet technology in identifying suppliers that fit a given purchasing requirement as specified in the various categories of purchases. Nevertheless, the internet provides firms with a platform to transact with different suppliers in a wider perspective and allow selection of suppliers. Findings from the study indicate that e-sourcing has enhanced procurement lead time reduction to a large percentage.

More so, it has encouraged transparency in the procurement process.

Watuleke (2017) citing Baron, Shaw, & Bailey (2000), electronic catalogs are defined as electronic representations of information about the products and/or services of an organization that are available for sale. The researcher points out

features of e-catalogues namely: Product catalogs that has information on tangible items of a firm such as office products, medical supplies, and farm supplies; Service catalogs which offer data on available professional services that are not tangible and may include information on such services as office maintenance, temporary personnel, and cleaning services and lastly Commodity-specific catalogs which gives data on specific product families such as chemicals, paper among other raw materials.

Gelderman, Semeijn and Nagel (2017) indicate that purchasing professionals are motivated to use electronic reverse auction in their sourcing strategy. Nevertheless, suppliers have to realize that an invitation to participate in an ERA is a form of power play from the buyer perspective. In addition, purchasing professionals value ERAs for the economic gains and benefits at the expense of suppliers. Reverse auctioning is a saving strategy in terms of cost and procurement time. More so, it reduces operating, selling and customer acquisition costs through an improved and expedited bidding process.

2.3.3. E-Invoicing and Supply Chain Performance

Potapenko (2010) argues that the impact of e-invoicing applications can be evaluated through cost benefits from decreased labour requirements, time savings and volume of processed invoices per invoice handling employee, change in the interest paid on overdue invoices, number of invoices with errors, eliminating the need for manual opening of mail, registering the invoices by hand, floor circulation of invoices in envelopes, as well as scanning and controlling for right content in case of semi-automated processing, is ascribed with substantial savings and immaterial benefits. Another widely ascribed benefit of the adoption of electronic invoicing is the increase in productivity the e-invoices offers. A study by Keifer (2011) notes that the numerous ways in which invoices can be exchanged between buyers (customers) and suppliers in a transaction. They include, paper invoice sent by post; invoice sent as an electronic attachment to an e-mail; electronic invoice created from scanning a paper document using optical character recognition; electronic invoice sent as structured EDI or XML document; both a paper invoice sent by post and electronic duplicate sent by other means. Nevertheless, e-invoice has various benefits, namely, digital invoice capture; automated invoice validation; vendor self-service; enhanced account reconciliation; enhanced spend management; access to early payment discounts; access to early payment discounts. Stephens and Valverde (2013) note that there is e-procurement reduces Transaction Costs. This is due to reduction in some of the common issues including supplier over charge, poor invoice checks / matching, incompatible processes result in lower transaction costs. However, the researchers argue that security of transactions is a consistent and growing problem for e-commerce and e-procurement solutions. Secure transactions are of importance if organizations are aware of the benefits of e-procurement which include increased productivity, lower purchasing pricing, streamlined processes, reduced order fulfillment time and greater budgetary control. Enhorning and Ostman (2015) while citing Nyveliusn (2009) argue that cost savings when changing to electronic invoicing is commonly around 25-50% of the manual handling cost. This is why e-invoices are used by customers due to the decreased handling time required.

According to Groznik and Manfreda (2015) defines an e-invoice as a document that contains mandatory elements for the goods delivered or services performed issued to the debtor or recipient in electronic form and equivalently replaces an invoice in the paper form. The study further points out benefits associated with e-invoicing like reduced administrative task and number of errors.

Pereira (2017) researched on impacts of electronic invoicing in the Portuguese healthcare sector as a potential savings on accounts payable. The study revealed that the costs and benefits of electronic invoicing are analyzed in a recipient perspective. The study further outlines indicators considered when calculating the benefits and efficiency gains of electronic invoicing which include percentage of orders sent by the company via EDI and paper, and the respective cost; number of suppliers with e-invoicing model; number of e-invoices per year; percentage of e-invoices over the total of invoices received from suppliers; time consumed during the processing of paper compared with electronic invoices. Ali (2016) conducted a study on adapting e-invoicing: benefits, challenges and future strategies to overcome challenges a comparative and indicated that e-invoicing is fully automated and it is cost efficient. Furthermore, both sender and receiver are free to choose their operators to exchange digital invoices since it's not a must for parties to choose same e-invoice operators for exchanging their digital invoices. The study further notes that e-invoicing promotes security and improved relationship with supplier.

2.3.4. E-Ordering and Supply Chain Performance

According to Wangui (2013), e-procurement on supply chain management at teachers' service commission established that departments adopted online requisitions to a high extent.

Moreover, the study asserts that an increase in online requisitions will lead to an increase in the corporation's supply chain performance. Turner, Deans, Kite, and Croal (2013) researched on the effect of electronic ordering on pre-analytical errors in primary care and noted a decrease in the number of pre-analytical errors as a result of e-ordering. Nevertheless, improvement on quality of information provided was highlighted.

Chepkwony and Chepkwony (2017) quoting Kim (2002) argues that E-ordering is the process of creating and approving purchasing requisition, placing purchase orders as well as receiving goods and services ordered, by using a software system based on internet technology which greatly improves the supply chain performance. In addition, the software system used is ordering catalogue system, Enterprise Resources Planning (ERP) and Electronic Data Interchange (EDI). The study found out that E-ordering has an effect on supply chain performance as it increases productivity and improves customer service since products and services. More so, there is reduction on paper work and also saves cost.

A study by Oteki, Namusonge, Sakwa and Ngeno (2018) on influence of electronic order processing on supply chain performance of sugar processing firms in Kenya. The study applied mixed research design with a target population

of 12 and a sample size of 367. The authors note that order processing starts with the purchase requisition from the customer which can be received either by faxes, phone, electronic file transfer / EDI. The study concludes that there is significant relationship between e-ordering practice and supply chain performance as it reduces order processing time, reduces paperwork thus reduced costs, reduces human errors, assists to monitor order due dates.

Bartai and Kimutai (2018) researched on the role of e-requisition on procurement performance of North Rift County Assemblies in Kenya. The study adopted descriptive survey design with a target population of 468 respondents. The findings suggest that e-requisition system has enhanced purchase office supplies by use of credit card. Furthermore, online ordering has been enhanced by use of E-requisition system. Lastly, the study recommended to the county assembly forum to implement e-procurement in their assemblies in order to improve procurement performance.

Samoei and Ndede (2018) conducted a study on adoption of e-procurement and financial performance of ministry of education, science and technology, Kenya. Descriptive research design was used and the study comprised of employees in the Ministry of Education, Science with a sample size of 40 staff working in information technology, accounts, procurement and finance departments. Questionnaires were used to collect primary data. The study concludes that e-ordering has a significant effect on most financial performance since there is reduced ordering error and increases ability to track orders.

Wariga (2017) while citing Ingram (2016) asserts that e-order systems records data of orders from clients and stores the information on the database. The data is then forwarded to logistics and accounting departments for further actions. Nevertheless, the study further reveals that e-ordering helps in keeping track of inventory and ensures quick response to customers' orders due to enhanced speed order process and reduced transmission error.

Findings from the study indicate that staff make use of e-requisition and post specification. In addition, the firm does the payment of goods and services through the internet.

2.3.5. Supply Chain Performance

Firms decentralize operational procurement processes and centralize strategic procurement processes as a result of the higher supply chain transparency provided by E-procurement systems. Quality is achieved due to the more concentration firms have on its customer needs and expectation (Farzin & Nezhad, 2010). This result from the mutual benefit the parties have as a result of easy and mutual communication between them.

Kagai (2013) cites that e-procurement system allow more efficient integration of supply chains and provide better organization and tracking of transaction records for easier data acquisition. Nevertheless, findings reveal that e-procurement practices improves communication externally with the suppliers, improves transparency during procurement process and helps in monitoring supplier performance therefore enhancing mutual trust with vendors. In addition, respondents of the study indicated that e-procurement practices highly improve visibility of supply chain with a mean of 3.83. Sundarraj and Kumari (2013) reveal that supply chains should synchronize and coordinate all of its activities across the entire supply-chain network, ranging from end-customers to suppliers. For this reason, the firm shall achieve order-cost reduction, reduced inventory costs, process decentralization, improved transparency of process, and improved relationships with suppliers. The authors further conclude that supply chains can be globally competitive only if all of its links work together in an efficient coordinated fashion by the use of electronic procurement technologies. A study by Kähkönen et al. (2013) on the effects of E-business on supply management indicated that e-business applications can be divided into e-commerce, e-procurement and e collaboration. The researchers argue that E-business technology is a powerful tool in contemporary supply management as it encourages efficient information integration between supply chain members which leads to automation of routine work, faster lead times, process transparency and opportunities for further improvements. Moreover, it promotes changes to companies' supply management and supply processes savings in cost and time, and development and change in business processes.

According to Shale (2014), e-procurement software system is designed to greatly reduce the time and effort required to complete purchasing transactions by eliminating traditional paper chain of requisitions, approvals, receiving and payment reconciliation. The study revealed that procurement cost reduction strategy has a direct relationship with e-procurement strategy and finally improving the procurement performance of state corporations in Kenya. The use of e-procurement technologies in procurement is aimed at realizing faster and more efficient operational procurement processes hence reducing procurement costs and thereby enhancing procurement performance.

Onsongo and Moronge (2016) argue that supply chain performance is an overall performance measurement that depends on the performance of the supply chain stages. However, the researchers conclude that lack of skills hindered smooth adoption of e-procurement in the public sector hence demoralizing performance. Candra and Gunawan (2016), procurement of goods and services electronically increase transparency and accountability, improve market access and healthy competition, as well as improving the efficiency of the procurement process. Furthermore, it improves data accuracy, increase efficiency in operations, faster process applications, reduce operating costs, reduce the supply cost improve customer services, and improve relationships with partners.

Tan and Trang (2017) conducted a study on issues of implementing electronic supply chain management in enterprise and found out that internet and IT influence SCM in enterprise, as it enables easier information sharing, real time communication to customer or supplier and gives faster response. Due to this, there is improved customer satisfaction, efficiency and effectiveness and increased market development. However, the scholars argue that there is need for knowledge management as a support tool in technology in order to promote effectiveness and efficiency.

2.4. Conceptual Framework

Nyambura (2018) citing Orodho (2008) defines conceptual framework as a presentation model where the researcher represents or conceptualizes the relationship between the variables being studied and shows the relationship diagrammatically or graphically.

Moreover, is a model which is hypothesized and identifies the variables or concepts that are being studied showing the relationship between them. This study contains independent variable and dependent variable. The independent variable includes e-tendering, e-sourcing, e-invoicing and e-ordering while the dependent variable is supply chain performance.

Multiple regression model and correlation analysis was used to determine whether there is a relationship between independent and dependent variable.

Figure 1: Conceptual Framework

2.5. Critique of the Existing Literature

E-procurement is a topic that has been discussed over the past decades. This is due to some of its implications towards organizations. The drivers for e-procurement have been realized both globally and locally. Past studies show that e-procurement has been adopted by many firms for supply chain performance, for instant; Kähkönen, Lintukangas and Virolainen (2013) conducted a study on the effects of e-business on supply management.

Rotich and Okello (2015) criticized innovation diffusion theory since it has got some limitation. In that it does not foster a participatory approach. This is so as it can only work best with adoption of behaviors. More so, it does not take into account organizations resources and social support in adoption of new methods. In addition, Inzofu (2016) cites that one of the limitations of this innovation diffusion theory is that it does not consider social support or individual resources. Bartai and Kimutai (2018) cite some of the criticism of resource-based theory. First, the theory defined a competitive advantage as a value-creating strategy that is based on resources that are among other characteristics, valuable. Secondly, the theory does not constitute a theory of the firm. Thirdly, the conditions of law like generalizations of empirical content, economic necessity and generalized conditionals are not met. Fourthly, different resource configurations can generate the same value for firms and thus would not be competitive advantage. Finally, the role of product markets is underdeveloped in the argument, limited focus on capabilities.

A study by Wangui (2013) on the effect of e-procurement on supply chain management at teachers "service commissions indicate that e-procurement affects the supply chain performance of TSC since its application is very high.

The research showed that lack of support from the Management and the fact that majority of the respondents said that e-procurement application does not assist in timely payment of suppliers. However, it failed to show how e-ordering can affect the performance of supply chain. Onsongo and Moronge (2016) researched on e-procurement adoption and supply chain performance in the public sector in Kenya. Their objectives were to determine how skills and policies that lack of skills hindered smooth adoption of e-procurement in the public sector.

The study revealed that although majority of organizations were committed to e-procurement skills development, training was still not at 100%. Moreover, inadequate policies were also a challenge in the implementation of e-procurement in the public sector. This study omitted some variables like e-tendering, e-sourcing, e-ordering and e-invoicing.

2.6. Summary of the Reviewed Literature

The aim of public entities is to promote service delivery to the public. For this to be done e-procurement has to be implemented so as to allow smooth buying of goods and services at the right time, place and quantity. Theories relevant to this study used to analyze objectives of the study includes technology acceptance theory, innovation diffusion theory, resource based theory and transaction cost theory. More so, empirical review related to this study gives a clear picture on e-procurement and its implications on supply chain. Various variables have been discussed to clearly show its influence on supply chain. They include; E-tendering, E-sourcing, E-invoicing and E-ordering. This chapter comes up with a conceptual framework to clearly show the relationship between independent variable and dependent variable. It further critique's the existing literature reviewed.

2.7. Research Gaps

E-procurement is a critical strategy that every organization aim implementing as it helps in the achievement of performance and enhances transparency and accountability in procurement process. There are a number of empirical studies that have tried to look e-procurement and supply chain performance. Mwongela (2014) looked at e-procurement adoption and supply chain performance among commercial banks in Nairobi, Kenya.

Chirchir, Ngeno and Chepkwony (2015) examined the relationship between e-procurement adoption and supply chain management practices in tea firms. Nyagah & Mwangangi (2015) determined influence of e-procurement implementation on supply chain performance in dairy industry in Kenya. Barngetuny and Kimutai (2015) ascertained the effects of e-procurement on supply chain management performance in Elgeyo-Marakwet County.

In addition, Onsongo and Moronge (2016) looked at e-procurement adoption and supply chain performance in the public sector in Kenya. Wariga (2017) determine electronic procurement implementation and supply chain performance of Dairy Firms in Kenya. Lastly,

Oteki, Namusonge, Sakwa and Ngeno (2018) examined the influence of electronic order processing on supply chain performance of sugar processing firms in Kenya. From the existing empirical studies, it is evident that a gap still exists as there is no study that comprehensively looked at influence of e-procurement on supply chain performance in relation to Safaricom PLC. There are still some of the challenges faced in Safaricom despite the introduction of e-procurement. For this reason, the study will examine e-procurement influence on supply chain performance of Safaricom in order to curb the problems encountered.

3. Research Methodology

3.1. Introduction

This chapter highlights the research design, population, sampling frame, sample and sample frame techniques, data collection instruments, data collection procedure, pilot test and finally data processing and design that was adopted.

3.2. Research Design

According to Rotich and Okello (2015), research design is used as a blue print for measurement and analysis of data. This study adopted descriptive research design in order to establish the influence of e-procurement on supply chain performance of Safaricom PLC.

Descriptive research design is used to justify current practice and allows the availed data for generalization (Samoei & Ndede, 2018). It is used to answer what and which questions (Ibrahim, 2017).

Nevertheless, Kisurkat while quoting (Oseno 2013) asserts that descriptive research design is non-experimental as it deals with relationships between non-manipulated variables in a natural rather than an artificial setting. It is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. The study will use case study strategy. According to Rahi (2017), a case study strategy is a written description of a problem or a situation and it presents small group problems or focus on a particular issue. It is mostly preferred when researcher has little control on events.

3.3. Population

Population is the entire set of units for which the study data are used to make inferences (Kothari 2003). Population for this study was from Safaricom Company Limited. The target population for this study comprised of staff from 7 Safaricom Retail Shops in Greater Western and Rift region. The study population consisted of 150 employees from Supply chain department; Finance departments and IT department. This study population was grouped into managerial

and Non-managerial staff (Customer Service Agents). According to Chepkemai (2014), target population refers to the entire group of individuals to which the researcher is interested in generating conclusions.

Target Population	Supply Chain Dept.	Finance Dept.	IT Dept.	Total
Managerial staffs	20	25	22	67
Customer Service Agents	28	25	30	83
Total	48	50	52	150

Table 1: Target Population

Source: Department of Human Resource, Safaricom Company Limited (2019)

3.4. Sampling Frame

According to Nyambura (2018), a sampling frame consists of a list of all the items where a representative sample is drawn for the purpose of a given study. The sampling frame for this study constituted a total of 150 staff from procurement, finance and IT departments where 67 were managerial staff and 83 were non-managerial staff. With a total number of 48 staff from supply chain department, 50 from finance department and 52 from IT department.

3.5. Sample and Sampling Techniques

3.5.1. Sample

Muli (2017) defines a sample as a section of the population chosen for the study. To determine the sample size for this study, Yamane's (1967) formula was adopted. According to him, for a 95% confidence level and $p = 0.5$, sample size was;

$$n = N$$

$$1 + N(e)^2$$

Where;

n = Sample size

N = Population size

e = Confidence Level (0.05)

Therefore, the sample size is;

$$n = 150 = 109$$

$$1 + 150(0.05)^2$$

$$\text{Sample size} = 109$$

3.5.2. Sampling Technique

Sampling is the process of selecting a suitable sample for the purpose of determining characteristics of the whole population (Mugo, 2002). This study used stratified random sampling. According to Saunders, Lewis and Thornhill (2009), stratified random sampling is a modification of random sampling in which you divide the population into two or more relevant and significant strata based on one or a number of attributes. A simple random sample was then used to draw from each of the strata. According to Mugo (2002), a simple random sample is free from bias.

Stratum	Target population	Formula	Sample size	%
Managerial Staff	67	$109/150(67)$	49	45
Customer Service Agents	83	$109/150(83)$	60	55
Total	150		109	100

Table 2: Sample Size Distribution

3.6. Data Instruments

The researcher used questionnaires to collect primary data. Both open ended and closed-ended questions were administered. Questionnaires are most appropriate for quantitative data as it allows collection of both subjective and objective data in a large sample of data in order to obtain results that are statistically significant. Attitude and opinion

questionnaires are used in descriptive research to enable one identify and describe the variability in different phenomena (Saunders et al., 2009).

The questionnaire was in Likert scale for which 1= Strongly disagreed 2= Disagreed 3= Neutral 4= Agreed 5= Strongly agreed. The questionnaires had six parts. Part A gave basic information about the employee and organization itself. Part B constituted questions on E-tendering and Supply chain performance. Part C provided questions on E-sourcing and Supply chain performance. Part D constituted questions on E-invoicing and Supply chain performance. Part E entailed questions on E-ordering and Supply chain performance. Lastly, part F constituted questions on supply chain performance.

3.7. Data Collection Procedures

The collection of primary data started after the researcher acquired a letter of introduction from Jomo Kenyatta University of Agriculture and Technology to introduce the researcher to Safaricom Limited Company for authorization to collect data. Once the permit was granted the questionnaires were delivered to the respondents. To curb issues pertaining confidentiality of information, a cover letter accompanied each question. This was to show the respondent the aim of the study and to assure them confidentiality.

3.8. Pilot Test

Pilot study tests the reliability and validity of the questionnaire. Pilot help in identification of errors in data collection instruments and make necessary adjustment in order to ensure valid and reliable data is collected (Njeru, 2015). A pilot study is performed to test the feasibility of techniques, methods, questionnaires, and interviews and how they function together in a particular context (Fahlman, Arscott & Guillot, 2018). It helps in pre-testing of research instruments. Pilot study should constitute 10% of the main study (Cooper and Schinder, 2008). For this study, the pilot study consisted of 11 employees from procurement department. During the main study, the respondents were excluded. This study used convenience random sampling to get the respondents for pilot study due to its convenience.

3.8.1. Validity of Instruments

Njeru (2015) refers validity to the extent to which an instrument measures what is supposed to measure. To establish the validity of the research instrument the supervisors of this study and a lecturer in the area of study were involved in order to get their opinion which helped in the revision of the research instrument and promoted the validity. Drost (2011) notes that validity is concerned with the meaningfulness of research components. The researcher considered Construct validity and content validity.

3.8.2. Reliability of Instruments

According to Drost (2011), reliability is consistency of measurement over time or stability of measurement over a variety of conditions. The reliability coefficient is the correlation between two or more variables (here tests, items, or raters) which measure the same thing.

Reliability analysis was conducted using Cronbach's alpha to determine whether the data gathered on each variable had a significant relationship with the role of e-procurement. The researcher considered internal consistency as it measures consistency within the instrument and questions.

3.9. Data Processing and Analysis

After data entry, each questionnaire was coded. The questionnaires were then cleaned. Quantitative data was analyzed by use of descriptive statistics like percentages, ratio, mean and standard deviation. Statistical Package for Social Sciences (SPSS 25.0) was used to analyze data. Inferential statistics included multiple regression and correlation analysis. Multiple regressions were used to determine the influence of independent variable and the dependent variable while correlation analysis was used to determine the nature of existing relationship between the independent variable and dependent variable. The study then tested assumptions of multiple regressions which included assumption of normality, linearity assumptions, homoscedasticity and assumption of multicollinearity.

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

Where;

Y= Supply chain performance

β_0 = Constant of Regression which is the value of the dependent variable when the independent variable is 0.

X1= E-tendering

X2= E-sourcing

X3= E-invoicing

X4= E-ordering

$\beta_1 \beta_2 \beta_3 \beta_4$ = Regression co-efficient

ϵ =Error term

4. Research Findings and Discussion

4.1. Introduction

The chapter presents the research findings and discussions of the study. Data analysis was done based on the objectives; to assess the influence of e-tendering on supply chain performance of Safaricom Limited Company, to establish the influence of e-sourcing on supply chain performance of Safaricom Limited Company, to determine the influence of e-

invoicing on supply chain performance of Safaricom Limited Company, and to examine the influence of e-ordering on supply performance of Safaricom Limited Company. Descriptive statistical analysis was employed in presentation of the findings. The chapter also presents correlations and regression analysis, hypothesis testing models and inferences drawn from the analysis.

4.2. Reliability and Validity Tests

Reliability of an instrument being the consistency of an instrument in measuring what it is intended to measure was established by first ensuring internal consistency approach followed by carrying out a pilot study. A questionnaire is considered reliable if the Cronbach's Alpha coefficient is greater than 0.70 (Katou, 2008). The four independent variables (e-sourcing, e-invoicing, e-tendering, and e-ordering) and the dependent variable (supply performance) were subjected to reliability test using SPSS and the results obtained are shown in Table 4.1. 10% of the sample size which translates to 11 participants was used in the pilot study. The results indicated that all the variables obtained had Cronbach's Alpha greater than 0.7 thereby achieving the recommended 0.7 for internal consistence of data (Mugenda & Mugenda, 2008).

Variable	Cronbach alpha
E-tendering	.931
E-sourcing	.862
E-invoicing	.876
E-ordering	.883
Supply performance	.795

Table 3: Reliability Test

Data validity is the degree to which a test measures that which it is supposed to measure (Porter, 2010). Mugenda and Mugenda (2008) define validity as the degree to which the research results obtained from the analysis of the data represent the phenomenon under study.

According to Table 4 Kaiser –Meyer –Olkin measure of sampling adequacy indicated KMO value of greater than 0.5 meaning thereby that the sample size was good enough to treat the sampling data as normally distributed. Bartlett's test sphericity which tested the null hypothesis "item to item correlation matrix based on the responses received from respondents for all the effective variables was an identity matrix". The Bartlett's test was evaluated through chi-square test having as shown in Table 4 for the entire variables and were all significant at 0.000 level of significant, indicating that null hypothesis is rejected.

Factors	KMO test	Bartlett's test of sphericity		
		Chi-Square	Df	Sig.
E-tendering	0.904	171.50	4	0.001
E-sourcing	0.816	176.48	4	0.003
E-invoicing	0.885	218.41	4	0.029
E-ordering	0.810	175.64	4	0.004
Supply performance	0.793	154.91	4	0.021

Table 4: Test for Validity
Extraction Method: Principal Component Analysis.

4.3. Response Rate

In this study, out of a total of 109 questionnaires that were distributed to the sampled respondents, 105 of them were filled and returned. Therefore, 105 were correctly filled and these were the once used for the analysis, which made up a response rate of 96.3%.

		Frequency	Percent
Valid	Returned	105	96.3
	Not Returned	4	4.2
	Total	109	100.0

Table 5: Questionnaire Return Rate

The study established that the researcher employed various strategic techniques that were attributed to the high response rate. For example, the researcher recruited a research assistant who was tasked with the distribution and collection of the questionnaires while the researcher carried out the interview schedules with the key informants.

4.4. Demographic Characteristics of the Respondents

This section contains the analysis of information on respondent's gender, age, qualification level, years worked in the current position, and years elapsed since e-procurement adoption. The main purpose of this was to find out any trend from the respondent's profile that was directly linked to the variables of the study.

4.4.1. Gender of the Respondents

The study sought to establish the gender of the respondents in the study, Table 6 shows the distribution of the respondents according to their gender.

Gender	Frequency	Percent	Mean	Std. Deviation
Female	48	45.3	1.345	.782
Male	57	54.7		

Table 6: Gender of the Respondents

According to the study findings, majority of the respondents were male 54.7% while female respondents were 45.3% with a deviation of 0.782.

4.4.2. Age Distribution of the Respondents

The study sought to establish the age of the respondents in the study, Table 8 shows the distribution of the respondents according to their age distribution.

Age	Frequency	Percent	Mean	Std. Deviation
18-28 years	17	16.2	2.20	1.161
29-39 years	46	43.2		
40-50 years	29	28.0		
51 years and above	13	12.6		

Table 7: Ages of the Respondents

According to the study findings, majority of the respondents (43.2%) were aged between 29-39 years; 28.0% between 40-50 years; 18-28 between 25-34 years; 12.6% 51 years and above with a deviation of 1.161.

4.4.3. Level of Education of the Respondents

The study sought to establish the age of the respondents in the study, Table 9 shows the distribution of the respondents according to their education level.

Level	Frequency	Percent	Mean	Std. Deviation
Certificate	11	10.0	2.19	0.924
Diploma	31	29.8		
Undergraduate	43	41.0		
Postgraduate	20	19.2		

Table 8: Highest Level of Education

4.4.4. Distribution of the Respondents in Relation to Years Elapsed Since the E-Procurement Adoption

The study also sought to establish the number of years e-procurement has lasted in their work stations. This was very important because previous studies indicated that there was strong relationship between length of adoption of e-procurement and supply chain performance. Table 8 shows the findings.

Age	Frequency	Percent	Mean	Std. Deviation
1-5 years	25	23.8	3.14	1.745
6-10 years	40	38.1		
10-15 years	24	22.9		
Above 15 years	16	15.2		

Table 9: Years Elapsed Since the E-Procurement Adoption

According to the findings in Table 4.6, majority of the respondents 38.4% had worked in the organization for between 4-6 years. Ideally when combined, more than 68.4% had worked for the organization for more than three years and only 31.6 % had worked with the organization for less than four years. From the findings, the researcher concluded that majority of the respondents had worked in the organization for quite some time and hence would provide valid and credible information on employee productivity.

4.5. Correlation Analysis

The results of correlation analysis are as shown in Table 4.8. The findings indicated that there was a strong positive and significant relationship between e-tendering and supply chain performance. This is depicted by a Pearson correlation coefficient $r=0.716$, $p\text{-value}=0.002<0.05$ which was significant at 0.05 level of significance. This implies that increased e-tendering results in increase of supply performance of Safaricom Limited Company.

		Correlations				
		Supply performance	E-tendering	E-sourcing	E-invoicing	E-ordering
Supply performance	Pearson Correlation	1				
	Sig. (1-tailed)					
E-tendering	Pearson Correlation	.716	1			
	Sig. (1-tailed)	.002				
E-sourcing	Pearson Correlation	.226*	.100*	1		
	Sig. (1-tailed)	.000	.036			
E-invoicing	Pearson Correlation	.057*	.006	-.359*	1	
	Sig. (1-tailed)	.001	.456	.000		
E-ordering	Pearson Correlation	.452*	.271.*	.009	.021	1
	Sig. (1-tailed)	.008	.282	.302	.017	
N		300	300	300	300	300

Table 10: Correlation Analysis of the Study Variables

*. Correlation Is Significant at the 0.05 Level (1-Tailed)

There was positive significant relationship between e-sourcing and supply chain performance with a Pearson correlation coefficient $r=0.226$, $p\text{-value}=0.000<0.05$ which was significant at 0.05 level of significance. This implies that increased e-sourcing results in an increase of supply performance of Safaricom Limited Company. The results indicated that there was positive significant relationship between e-invoicing and supply chain performance. This is depicted by a Pearson correlation coefficient $r=0.057$, $p\text{-value}=0.001<0.05$ which was significant at 0.05 level of significance. This implies that increase in e-invoicing results in an increase in supply performance of Safaricom Limited Company. There was positive and significant relationship between e-ordering and supply performance with a Pearson correlation coefficient $r=0.452$, $p\text{-value}=0.008<0.05$ which was significant at 0.05 level of significance. This implies that increased e-ordering results in an increase of supply performance of Safaricom Limited Company.

4.5.1. Collinearity Tests

Collinearity is the measure of the degree of association between the variables. Serial correlation was performed using the Durbin Watson test statistic. The summary of the findings are as shown in Table 11.

Strategy	Collinearity statistics
E-tendering	1.792
E-sourcing	1.745
E-invoicing	1.862
E-ordering	1.806
Durbin Watson (D-W) statistic=2.017	
Supply performance	1.791

Table 11: Summary Table on Collinearity Tests

Study findings shows that there is a positive autocorrelation as depicted by (D-W=2.017> 2). The result of the Durbin Watson (D-W) statistic measure was 2.017 which is greater than the threshold of 2. This shows that the dependent variables and the independent variables are negatively auto correlated.

4.6. E-Tendering and Supply Chain Performance

E-tendering offers broad benefits, which includes; price reduction due to reduced paper work, postage fee and other cost associated with preparation and sending of tender documents (Barngetuny & Kimutai, 2015). This study sought to determine whether e-tendering influences supply chain performance. The response was as shown in Figure 4.1.

Figure 2: Extent E-Tendering Has Influenced Supply Chain Performance

From Figure 237.3% and 22.1% of the respondents agreed to great extent and to very great extent respectively that E-tendering has influenced supply chain performance. This showed that e-tendering influences supply chain performance.

Descriptive analysis of the responses was done in the scale of 1-5 (where 1=Strongly Disagreed (SD), 2=Disagreed (D), 3=Neutral, 4=Agreed (A), and 5 = Strongly Agreed (SA)). The summary of the responses was as tabulated in Table 12.

Description	N	SD (%)	D (%)	Neutral (%)	A (%)	SA (%)	Mean	S.D
Submission of bids by prospective suppliers is done online	105	11 (10.4)	15 (13.8)	21 (20.4)	43 (41.5)	15 (13.8)	4.21	1.21
Our company adopts online evaluation of tenders	105	4 (4.2)	13 (12.8)	24 (22.8)	49 (46.7)	15 (13.5)	4.15	1.132
Our company awards the best bidder online	105	12 (11.8)	15 (13.8)	22 (21.1)	39 (37.0)	17 (16.3)	4.04	1.268
Suppliers are able to access tenders/quotation/requests any time anywhere	105	6 (5.5)	19 (18.3)	26 (24.5)	29 (27.3)	20 (24.2)	3.65	1.263
Shortlisting of suppliers is performed through the firm's website	105	2 (2.1)	17 (15.9)	22 (21.1)	37 (35.3)	27 (25.6)	4.24	1.155
Our company receives responses from suppliers online	105	15 (14.5)	19 (18.0)	24 (22.8)	24 (23.2)	23 (21.5)	3.98	1.321

Table 12: Descriptive Statistics on E-Tendering

From Table 13, 41.5% of the respondents agreed that submission of bids by prospective suppliers are done online, 46.7% of the respondents with a mean of 4.15 agreed that their company has adopted online evaluation of tenders. With a mean of 4.04, 37.0% of the respondents agreed that their company award the best bidder online. Though 35.3% and 27.3% agreed that short listing of suppliers is performed through the firm's website and suppliers are able to access tenders/quotation/requests any time anywhere respectively, 23.2% agreed that their company receives responses from suppliers online, though with a mean of 3.98, 23.2% of respondents agreed that their company receives responses from suppliers online.

This result showed that e-tendering practice has enabled faster submissions of tender documents by prospective suppliers therefore shortening the tender cycle period and cost associated during tender process. Hypothesis 1: E-tendering on supply chain performance

- Ho1 There is no significant influence of e-tendering on supply chain performance of Safaricom Limited Company.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.657 ^a	.431	.437	5.03507

Table 13: Model Summary

From the study findings in Table 13, the value of R-square is 0.431. This implies that, 43.1% of variation of supply chain performance of Safaricom Limited Company was explained by E-tendering.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3320.7741	1	3320.741	170.431	.002 ^b
	Residual	5704.176	104	25.352		
	Total	9024.916	105			

Table 14: ANOVA Test

a. Dependent Variable: Supply Chain Performance

b. Predictors: (Constant), E-Tendering

From the findings in Table 14, at 0.05 level of significance the ANOVA test indicated that in this model the independent variable namely; E-tendering is important in predicting of supply chain performance of Safaricom Limited Company as indicated by significance value=0.002

which is less than 0.05 level of significance ($p=0.002 < 0.05$)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.476	.712		6.285	.000
	E-tendering	0.510	.026	.910	19.927	.002

Table 15: Coefficients Model

a. Dependent Variable: Supply Chain Performance

From Table 15, the study findings revealed that E-tendering had significant influence on supply chain performance of Safaricom Limited Company (t -statistic=19.927, p -value=0.002< 0.05). Therefore at 5% level of significance the null hypothesis was rejected, indicating that E-tendering a positive significant relationship with supply chain performance of Safaricom Limited Company. Thus, for every unit increase in E-tendering there was a corresponding increase of supply chain performance of Safaricom Limited Company by 0.510.

4.7. E-Sourcing and Supply Chain Performance

Wariga (2017), defines e-sourcing as the application of internet technology in identifying suppliers that fit a given purchasing requirement as specified in the various categories of purchases. Nevertheless, the internet provides firms with a platform to transact with different suppliers in a wider perspective and allow selection of suppliers.

From Figure 3, 16.3% and 37.0% of the respondents to very great extent and great extent agreed that e-sourcing influences supply chain performance. Though 25.6% of the respondents disagreed that supply chain performance influences supply chain performance, 74.4% of the respondents opined that to an extent e-sourcing influences supply chain performance (Figure 3).

Figure 3: Extent E-sourcing has Influenced Supply Chain Performance

In the scale of 1-5 (where 1=No Extent (NE), 2=Small Extent (SE), 3=Moderate Extent (ME), 4= Great Extent (GE), and 5 = Very Great Extent (VGE), the responses on e-sourcing was done and the summary is as shown in Table 16.

Description	N	NE (%)	SE (%)	ME (%)	GE (%)	VGE (%)	Mean	S.D
Our company develops contract terms online	105	4 (3.5)	4 (3.8)	23 (21.5)	29 (27.7)	45 (43.6)	4.18	0.980
Our company uses internet based technologies to access online suppliers' catalogues which provides list of goods or services on sale with their description and prices published	105	13 (12.1)	15 (14.5)	21 (20.1)	23 (21.8)	33 (31.5)	4.01	1.220
Sourcing is done from a number of suppliers online	105	12 (11.8)	15 (13.8)	22 (21.1)	39 (37.0)	17 (16.3)	4.04	1.268
New suppliers and potential suppliers are identified online	105	8 (7.1)	29 (27.8)	27 (25.4)	24 (22.5)	17 (17.2)	4.01	1.110
Our company maintains a good E-supplier partnership through frequent visit of supplier's website	105	11 (10.4)	14 (13.1)	16 (14.9)	36 (34.6)	28 (27.0)	4.21	1.192

Table 16: Descriptive Statistics on E-Sourcing

From Table 16, 43.6% of the respondents to a very great extent agreed that their company develops contract terms online, 31.5% of the respondents with a mean of 4.01 agreed that their company uses internet-based technologies to access online suppliers' catalogues which provides list of goods or services on sale with their description and prices published. To a great extent, 37.0% of the respondents agreed that sourcing is done from a number of suppliers online and 25.4% strongly agreed that new suppliers and potential suppliers are identified online. Additionally, 34.6% to great extent agreed that their company maintains a good E-supplier partnership through frequent visit of supplier's website.

- Hypothesis 2: E-Sourcing and supply chain performance
- Ho2 There is no significant influence of e-sourcing on supply chain performance of Safaricom Limited Company.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.226 ^a	.045	.040	2.675

Table 17: Model Summary

From findings in Table 17, the value of R-Square is 0.045. This implies that, 4.5% of variation of supply chain performance of Safaricom Limited Company was explained by E-sourcing.

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1232.942	1	1232.942	659.160	.021 ^b
Residual	153.379	104	1.870		
Total	1386.321	105			

Table 18: ANOVA Table

a. Predictors: (Constant), E-sourcing

b. Dependent Variable: Supply Chain Performance

From the findings in Table 18, at 0.05 level of significance the ANOVA test indicated that in this model the independent variable namely; E-sourcing, is important in predicting of supply chain performance of Safaricom Limited Company as indicated by significance value=0.021 which is less than 0.05 level of significance ($p=0.021 < 0.05$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.406	.557		7.913	.567
	E-sourcing	0.128	.024	.943	25.674	.021

Table 19: Coefficients for the Model

Dependent Variable: Supply chain performance From Table 19; the study revealed that E-sourcing had a significant influence on supply chain performance of Safaricom Limited Company (t statistic=25.674, p -value=0.021 < 0.05).

Therefore at 5% level of significance the null hypothesis was rejected, indicating that E-sourcing has a significant influence on supply chain performance of Safaricom Limited Company. Likewise, for every unit increase in E-sourcing there was a corresponding increase in supply chain performance of Safaricom Limited Company by 0.128.

4.8. E-Invoicing and Supply Chain Performance

E-invoice has various benefits, namely, digital invoice capture; automated invoice validation; vendor self-service; enhanced account reconciliation; enhanced spend management; access to early payment discounts; access to early payment discounts (Pereira, 2017). Additionally, e-invoicing is considered to promote security and improved relationship with supplier.

The respondents were asked to rate whether e-invoicing influences supply chain performance and the summary of the findings is as shown in Figure 4.

Figure 4: Extent E-Invoicing Has Influenced Supply Chain Performance

From Figure 4, 22.5% and 30.4% of the respondents to very great extent and great extent agreed that e-invoicing influences supply chain performance. A small proportion of the respondents (4.8%) disagreed that e-invoicing influences supply chain performance (Figure 4). This shows that e-invoicing plays a key role in supply chain performance.

The result confirms the findings by Croom and Johnston (2013) affirming that e-invoicing guarantees timeliness, criticality, credibility, adequacy and quality with accuracy therefore more noticeable supply chain performance. This concurs with the study carried out by

Kennedy (2015) that e-invoicing plays a major role in ensuring an organizations' effective communication. In the scale of 1-5 (where 1=Strongly Disagreed (SD), 2=Disagreed (D), 3=Neutral, 4=Agreed (A), and 5 = Strongly Agreed (SA))

Description	N	SD (%)	D (%)	Neutral (%)	A (%)	SA (%)	Mean	S.D
Our company conducts invoice payment online	105	10 (9.0)	29 (27.3)	27 (25.6)	29 (27.3)	10 (10.7)	3.93	1.157
Adoption of e-invoicing adversely impacts transactional cost	105	5 (4.8)	20 (18.7)	25 (23.5)	32 (30.4)	23 (22.5)	3.99	1.166
Our company uses electronic data interchange to exchange invoices	105	9 (8.3)	13 (12.5)	30 (28.7)	31 (29.4)	22 (21.1)	4.02	1.144
Our company utilizes electronic payment system to settle bills	105	12 (11.8)	13 (12.5)	21 (19.7)	28 (27.0)	31 (29.1)	4.16	1.199
Electronic fund transfer payment assist to transfer money to the suppliers and employees account	105	4 (3.5)	4 (3.8)	23 (21.5)	29 (27.7)	45 (43.6)	4.18	1.089

Table 20: Descriptive Statistics on E-Invoicing

From the study findings in Table 20, 27.3% of the respondents agreed that their company conducts invoice payment online, while 30.4% agreed that adoption of e-invoicing adversely impacts transactional cost. With a mean of 4.02, respondents agreed that their company uses electronic data interchange to exchange invoices, while 29.1% strongly agreed their company utilizes electronic payment system to settle bills. Additionally, 43.6% of the respondents strongly agreed that electronic fund transfer payment assist to transfer money to the suppliers and employees account.

- Hypothesis 3: E-Invoicing and supply chain performance
- Ho3 There is no significant influence of e-invoicing on supply chain performance of Safaricom Limited Company

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.722 ^a	.522	.520	4.93906

Table 21: Model Summary for E-invoicing

From findings in Table 21, the value of R-Square is 0.522. This implies that, 52.2% of variation of supply chain performance of Safaricom Limited Company was explained by E-invoicing.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4988.640	1	4988.640	245.493	.013 ^b
	Residual	4488.725	104	24.394		
	Total	9477.366	105			

Table 22: ANOVA Table

a. Predictors: (Constant), E-invoicing

b. Dependent Variable: Supply Chain Performance

From the findings in Table 22, at 0.05 level of significance the ANOVA test indicated that in this model the independent variable namely; E-invoicing is important in predicting of supply chain performance of Safaricom Limited Company as indicated by significance value=0.013 which is less than 0.05 level of significance ($p=0.013 < 0.05$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.919	1.334		14.682	.000
	E-invoicing	0.175	.055	.176	3.183	.006

Table 23: ANOVA Table

a. Dependent Variable: Supply Chain Performance

From Table 23; the study revealed that E-invoicing had significant influence on of supply chain performance of Safaricom Limited Company (t statistic=3.183, p -value=0.006 < 0.05). Therefore at 5% level of significance the null hypothesis was rejected, indicating E-invoicing had a positive influence on supply chain performance of Safaricom Limited

Company. Again for every unit increase in E-invoicing there was an increase in supply chain performance of Safaricom Limited Company by 0.175.

4.9. E-Ordering and Supply Chain Performance

Respondents were asked on their opinion whether E-ordering practice enhances supply chain performance, and majority 47.2% to great extent were of the view that E-ordering practice enhances supply chain performance as shown in Figure 4.4.

Figure 5: E-ordering and Supply Chain Performance

With a mean of 4.13, 45.0% of the respondents agreed that receipt and payment of goods and services are done online by their company. Though 35.3% and 25.6% agreed that all the purchase requisitions by the company's staff are online, 27.7% agreed that authorization of orders are done online. Additionally, 34.9% of the respondents agreed that their company provides item specification online. With a mean of 4.21, respondents agreed that dispatch of purchase orders are done online by the use dispatch method (print, fax, phone, email or electronic). The summary of the findings is as shown in Table 24.

On statements regarding e-order processing, In the scale of 1-5 (where 1=Strongly Disagreed (SD), 2=Disagreed (D), 3=Neutral, 4=Agreed (A), and 5 = Strongly Agreed (SA))

Description	N	SD (%)	D (%)	Neutral (%)	A (%)	SA (%)	Mean	S.D
Receipt and payment of goods and services is done online	105	12 (11.4)	13 (12.8)	19 (18.3)	47 (45.0)	14 (12.5)	4.13	1.21
All the purchase requisitions by the company's staff are online	105	2 (2.1)	17 (15.9)	22 (21.1)	37 (35.3)	27 (25.6)	4.24	1.155
Authorization is done online	105	4 (3.5)	4 (3.8)	23 (21.5)	29 (27.7)	45 (43.6)	4.18	0.980
Our company provides Item specification online	105	4 (4.5)	28 (26.3)	18 (17.0)	37 (34.9)	18 (17.3)	3.99	1.263
Dispatch of purchase orders are done online by the use dispatch method (print, fax, phone, email or electronic)	105	11 (10.4)	14 (13.1)	16 (14.9)	36 (34.6)	28 (27.0)	4.21	1.155

Table 24: Descriptive Statistics on E-Ordering

- Hypothesis 4: E-ordering and supply chain performance
- H_{04} There is no significant influence of e-ordering on supply chain performance of Safaricom Limited Company.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.390 ^a	.324	.323	2.51782

Table 25: Model Summary

From findings in Table 25, the value of R-Square is 0.324. This implies that, 32.4% of variation of supply chain performance of Safaricom Limited Company was explained by E-ordering.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6634.207	1	5634.207	374.029	.002 ^b
	Residual	3592.410	104	20.411		
	Total	10226.617	105			

Table 26: ANOVA Table

a. Predictors: (Constant), E-ordering

b. Dependent Variable: Supply Chain Performance

From the findings in Table 26, at 0.05 level of significance the ANOVA test indicated that in this model the independent variable namely; E-ordering is important in predicting of supply chain performance of Safaricom Limited Company as indicated by significance value=0.002 which is less than 0.05 level of significance ($p=0.002<0.05$).

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	2.487	1.428		1.741	.083
	E-ordering	.521	.048	.790	7.340	.002

Table 27: Coefficients for the Model

a. Dependent Variable: Supply Chain Performance

From Table 27; the study revealed that E-ordering had a significant influence on supply chain performance of Safaricom Limited Company (t -statistic=6.117, p -value=0.002 < 0.05).

Therefore at 5% level of significance the null hypothesis was rejected, indicating that e-ordering had a positive influence on supply chain performance of Safaricom Limited Company. This means for every unit increase in E-ordering there was a corresponding increase in supply chain performance of Safaricom Limited Company by 0.521.

The result confirms the findings by Kim (2017) who posits that e-ordering improves the performance of supply chain greatly because purchasing orders placement and reception of services and goods ordered is enabled by internet technology use. It is also in agreement with the findings of Evans et al. (2018) on electronic order processing which has influence on supply procurement performance on supply chain.

4.10. Supply Chain Performance

In the scale of 1-5 (where 1=Strongly Disagreed (SD), 2=Disagreed (D), 3=Neutral, 4=Agreed (A), and 5 = strongly agreed (SA), the respondents were asked to rate whether supply chain performance has improved with introduction of e-procurement. The summary of the findings is as shown in Table 28.

Description	N	SD (%)	D (%)	Neutral (%)	A (%)	SA (%)	Mean	S.D
Our firm supply chain performance has improved as a result of e-procurement adoption	105	2 (2.1)	13 (12.1)	23 (21.8)	44 (41.9)	23 (22.1)	4.24	1.207
Cost management is achieved due to reduction in transaction cost and reduced paper work and cost	105	11 (10.0)	13 (12.8)	28 (26.6)	36 (33.9)	17 (16.6)	4.02	1.192
Our firm runs its operations well as a result of e-invoicing and e-ordering that leads to timely delivery	105	12 (11.8)	13 (12.5)	28 (26.6)	37 (35.6)	14 (13.5)	3.91	1.192
Transparency in procurement process is achieved as a result of e-tendering and e-sourcing	105	10 (9.3)	14 (13.5)	29 (28.0)	37 (35.3)	15 (13.8)	4.14	1.151
Quality of products and services are obtained as a result of e-sourcing which helps in obtaining prospective suppliers	105	12 (11.1)	11 (10.7)	19 (18.0)	30 (28.4)	33 (31.8)	4.15	1.164
There is improved user satisfaction due to quality of products and services which results from e-procurement adoption	105	12 (11.4)	12 (11.8)	25 (24.2)	35 (32.9)	21 (19.7)	4.05	1.170

Table 28: Descriptive Statistics on Supply Chain Performance

Respondents were asked to respond on supply chain performance statements and the findings indicate that the respondents agreed to a large extent their firm supply chain performance has improved as a result of e-procurement adoption as indicated by a mean of 4.24. The use of e-procurement has led to achievement of cost management due to reduction in transaction cost and reduced paper work and cost (mean of 4.02). Respondents also agreed (35.6%) that their firm runs its operations well as a result of e-invoicing and e-ordering that leads to timely delivery. Additionally, the use of e-procurement is strongly agreed to have led to transparency in procurement process is achieved as a result of e-tendering and e-sourcing (mean 4.14). The use of e-procurement has led to the improvement of quality of products and services as a result of e-sourcing which helps in obtaining prospective suppliers (mean of 4.15). Lastly, 32.9% of the respondents agreed that there is improved user satisfaction due to quality of products and services which results from e-procurement adoption

The quantitative findings were supported by qualitative data by the 7 (100%) managers interviewed that E-procurement improved efficiency of the supply chain because procurement process time reduced, reduced process costs by elimination of most stationery, that e-procurement saves money by preventing duplicate spending, leveraging volume buying and that e-procurement saves the organization from needing more room and enhances file retrieval easy. On the issue of reports 6 (85.7%) out of 7 (14.3%) managers interviewed indicated that electronically conducting procurement makes it easier to write and analyze reports on procurement systems and this enables managers to make decisions based on reports that are accessible electronically any time.

4.10.1. Multiple Linear Regression for All the Variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4826.804	4	1456.701	33.122	.011 ^a
	Residual	10721.669	101	43.980		
	Total	15548.473	105			

Table 29: Anova Table

a. Predictors: (Constant), E-Tendering, E-Sourcing, E-Invoicing, and E-Ordering
b. Dependent Variable: Supply Chain Performance

The ANOVA test is used to determine whether the model is important in predicting the supply chain performance of Safari com Limited Company. At 0.05 level of significance the ANOVA test indicated that in this model the independent variables namely; E-tendering, E-sourcing, E-invoicing, and E-ordering were predictors of supply chain performance of Safaricom Limited Company as indicated by significance value=0.011 which is less than 0.05 level of significance ($p=0.011<0.05$).

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.296	2.218		4.994	.002
	E-tendering	0.211	.065	.229	3.229	.017
	E-sourcing	0.338	.083	.071	.943	.001
	E-invoicing	0.198	.102	.156	1.944	.020
	E-ordering	0.012	.066	.377	5.008	.011

Table 30: Model Coefficients

a. Dependent Variable: Supply Chain Performance

Letting Y be supply chain performance, X1 be E-tendering, X2 be E-sourcing, X3 E-invoicing, and X4 be E-ordering, using the regression coefficients in Table 4.31, we have;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4$$

$$Y = 9.296 + 0.211 * X_1 + 0.338 * X_2 + 0.198 * X_3 + 0.012 * X_4$$

From the equation above when E-tendering is increased by one supply chain performance will increase by 0.211, a unit increase in E-sourcing will result in 0.338 increase in supply chain performance, a unit increase in E-invoicing will result to 0.198 increase in supply chain performance, and finally a unit increase in E-ordering will result to 0.012 increase in supply chain performance of Safaricom Limited Company.

5. Conclusion and Recommendation

5.1. Introduction

In this chapter conclusion, recommendations, and suggestions for further research gaps have been highlighted.

5.2. Summary of Major Findings

There was positive significant relationship between e-sourcing and supply chain performance which implies that increased e-sourcing results in an increase of supply performance of Safaricom Limited Company. The results indicated that there was positive significant relationship between e-invoicing and supply chain performance, implying that increase in e-invoicing results in increase in supply performance of Safaricom Limited Company. There was positive significant relationship between e-ordering and supply chain performance, meaning that an increase in e-ordering results in increase in supply performance of Safaricom Limited Company. The study revealed that E-tendering had significant influence on supply, hence an increase in e-tendering results to increase in supply performance of Safaricom Limited Company.

5.3. Conclusion

The study concludes that e-tendering has a significant effect on supply chain performance. This shows that e-tendering improvement would result to increase in supply chain performance of Safaricom Limited Company. Additionally, e-tendering allows electronic bidding, creates evaluation matrices, help identify tender shortlist and control prequalification process.

The study concludes that e-sourcing had a significant effect on supply chain performance of Safaricom Limited Company. E-sourcing allows for online supplier search and electronic supplier evaluation. This implies that an improvement in e-sourcing would lead to an improvement in the Safaricom's Limited Company supply chain performance. The study concludes that e-invoicing has a significant impact on supply chain performance of Safaricom Limited Company. Though, both sender and receiver are free to choose their operators to exchange digital invoices since it's not a must for parties to choose same e-invoice operators for exchanging their digital invoices, the study notes that e-invoicing promotes security and improved relationship with supplier. This implies that an improvement in e-invoicing would lead to an improvement in supply chain performance.

The study concludes that e-ordering has a significant effect on supply chain performance of Safaricom Limited Company. E-ordering leads to reduced ordering error and increases ability to track orders. This shows that an improvement in e-ordering would lead to an improvement in supply chain performance.

5.4. Recommendations

The study established that E-tendering processing practice enhances supply chain performance positively. It is recommended that management should ensure that all modules from purchasing Requisition, Quotation/tenders, request for proposals, purchasing order approvals and Transmission, contract monitoring, Goods receipt note. This will reduce tender processing time, eliminate postal, printing & storage costs, wide supplier base will be achieved and audit trails will be maintained thus reduction of corruption.

From the study established that E-sourcing practice enhanced supply chain performance by Stocks being managed by application of MRP, EOQ, stock aging, stock location, receiving, issuing stocks and stock reports electronically. It is recommended that application of Bar codes should be improved to improve receipts and issues of stocks. It is recommended that management should ensure working Websites, working internal and External mail to improve supplier and buyer's integration. To improve buyer/supplier relationship in time electronic payment to suppliers is necessary. The study also found out that E-ordering processing practice enhances supply chain performance. It is recommended that in order to achieve maximum benefits of reduced order processing time, reduced costs, reduced human errors and improved delivery, management should enhance electronic system and insist on all orders being processed electronically.

5.5. Suggestions for Further Research

Since this study is considered as the first attempt to investigate the concept of e-Procurement in Safaricom Limited, directions for further research are suggested. Further comparative studies with other private companies that are service providers are needed in order to determine the effects of e-Procurement on Supply Chain Management. On the other hand critical success factors in implementation of e-Procurement should be subjected to review, critique and discussion for an extended period before making a generalization. Further research should be conducted to determine the challenges faced in the implementation of information technology in the procurement process.

6. Acknowledgement

I would like to thank Almighty God; I thank my family for their support and encouragement. Regards goes to my supervisor Dr. Dennis Juma Okello for being a mentor at Jomo Kenyatta University of Agriculture and Technology. Thanks to the respondents sampled who provided data for this study. To all my friends who contributed to the completion of this academic document both directly and indirectly, may you be blessed. Special thanks to other persons who in one or another way contributed during this process. May the almighty GOD bless them.

7. Abbreviation and Acronyms

GSM	- Global System for Mobile communication
CIPS	- Chartered Institute of Purchasing and Supply Management
EDI	- Electronic Data Interchange
E-GP	- Electronic Government Procurement
ERA	- Electronic Reversed Auction
ERP	- Enterprise Resources Planning
IFMIS	- Integrated Financial Management Information System

OECD	- Organization for Economic Cooperation and Development
RFP	- Request for Proposal
RFI	- Request for Information
SCBK	- Standard Chartered Bank of Kenya
SCM	- Supply Chain Management
SMEs	- Small and Medium Enterprises
TAM	- Technology Acceptance Theory
TCT	- Transaction Cost Theory
XML	- Extensible Markup language

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Appendix

Appendix I: Introductory Letter

Brenda Lubisia

Jomo Kenyatta University of
Agriculture and Technology

P.O Box 1527-50100

Kakamega

Tel.0721790637

E-mail: brenafuna@gmail.com

Date.....

To,

The Safaricom Limited Company,

P.O. Box

Nairobi, Kenya.

Dear Sir / Madam,

Re: Request For Academic Research Data Collection.

I am writing to kindly request for permission to collect data from your organization. As a postgraduate candidate from Jomo Kenyatta University of Agriculture and Technology pursuing Masters in Procurement and Logistics Management, it is a requirement that I do a research work after the course work. I am conducting a study on influence of e-procurement on supply chain performance of Safaricom Limited Company.

I kindly request for permission to obtain data from your firm as it has been selected as a potential respondent in this study. This research will use questionnaires to collect data which will be given to managerial and non-managerial staffs from procurement department, finance department and IT department. The data will only be used for academic purpose and information received will be treated with confidentiality. The research findings and recommendation will be availed to you if necessary.

Thank you.

Yours faithfully,

Brenda Lubisia,

Postgraduate Student, JKUAT.

Questionnaire

This questionnaire is designed to collect data from Safaricom Limited Company in order to determine the influence of e-procurement on supply chain performance. Please tick (✓) the box that matches your answer to the question and give answers in the spaces provided as appropriate. Your participation will be highly appreciated.

SECTION A: Background Information.

1. Gender

Female () Male ()

2. Age of the Respondent

18 to 28 yrs () 29 to 39 yrs () 40 to 50 yrs () Above 51 yrs ()

3. Level of Qualification

Certificate () Diploma () Undergraduate () Postgraduate ()

4. Does your firm has a Procurement Department

Yes () No ()

5. What is your job title

6. How many years worked in the current position

7. How many years have elapsed since the e-procurement adoption?

1 to 5 yrs () 6-10 yrs () 10-15 yrs () Above 15 yrs ()

SECTION B: E-tendering and Supply Chain Performance

8. To what extent does E-tendering influence Supply chain performance?

Very great extent ()

Great extent ()

Moderate extent ()

Little extent ()

No Extent ()

9. In the scale of 1-5, kindly indicate to what extent you agree or disagree with the following

statements about E-tendering

Where; 1= Strongly disagreed 2= Disagreed 3= Neutral 4= Agreed 5= Strongly agreed

No	Statements	5	4	3	2	1
i.	Submission of bids by prospective suppliers is done online					
ii.	Our company adopts online evaluation of tenders					
iii.	Our company awards the best bidder online					
iv.	Suppliers are able to access tenders/quotation/requests any time anywhere.					
v.	Short listing of suppliers is performed through the firm's website					
vi.	Our company receives responses from suppliers online					

Table 31

Section C: E-Sourcing and Supply Chain Performance

10. To what extent does E-sourcing influence Supply chain performance?

Very great extent ()

Great extent ()

Moderate extent ()

Little extent ()

No Extent ()

11. To what extent does your firm implement E-sourcing?

Kindly use the scale of 1-5.

where 1= No extent 2= Small extent 3=Moderate extent 4= Great extent 5= Very great extent

No	Statement	5	4	3	2	1
i.	Our company develops contract terms online					
ii.	Our company uses internet-based technologies to access online suppliers' catalogues which provides list of goods or services on sale with their description and prices published					
iii.	Sourcing is done from a number of suppliers online					
iv.	New suppliers and potential suppliers are identified online					
v.	Our company maintains a good E-supplier partnership through frequent visit of supplier's web site					

Table 32

Section D: E- Invoicing and Supply Chain Performance

12. To what extent does E-invoicing influence supply chain performance?

Very great extent ()

Great extent ()

Moderate extent ()

Little extent ()

No Extent ()

13. In the scale of 1-5, kindly indicate the extent to which your firm uses e-invoicing

Where; 1= Strongly disagreed 2= Disagreed 3= Neutral 4= Agreed 5= Strongly agreed

No	Statement	5	4	3	2	1
i.	Our company conducts invoice payment online					
ii.	Adoption of e-invoicing adversely impacts transaction cost					
iii.	Our company uses electronic data interchange to exchange invoices					
iv.	Our company utilizes electronic payment system to settle bills.					
v.	Electronic fund transfer payment assist to transfer money to the suppliers and employees account					

Table 33

Section E: E-Ordering and Supply Chain Performance

14. To what extent does E-ordering influence supply chain performance?

Very great extent ()

Great extent ()

Moderate extent ()

Little extent ()

No Extent ()

15. In the scale of 1-5, kindly indicate the extent to which your firm adopts E-ordering
Where; 1= Strongly disagreed 2= Disagreed 3= Neutral 4= Agreed 5= Strongly agreed

No	Statement	5	4	3	2	1
i.	Receipt and payment of goods and services is done online					
ii.	All the purchase requisitions by the company's staff are online					
iii.	Authorization is done online.					
iv.	Our company provides item specification online					
v.	Dispatch of purchase orders is done online by the use dispatch method (print, fax, phone, email or electronic)					

Table 34

Section F: Supply Chain Performance

16. Below are statements of supply chain performance in relation to e-procurement. Rate your extent of agreement by use of scale 1-5

Where; 1= Strongly disagreed 2= Disagreed 3= Neutral 4= Agreed 5= Strongly agreed

No	Statement	5	4	3	2	1
i.	Our firm supply chain performance has improved as a result of e-procurement adoption					
ii.	Cost management is achieved due to reduction in transaction cost and reduced paper work and cost.					
iii.	Our firm runs its operations well as a result of e-invoicing and e-ordering that leads to timely delivery					
iv.	Transparency in procurement process is achieved as a result of e-tendering and e-sourcing.					
v.	Quality of products and services is obtained as a result of e-sourcing which helps in obtain prospective suppliers.					
vi.	There is improved user satisfaction due to quality of products and services which results from e-procurement adoption					

Table 35