



E-PROCUREMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE IN SERVICE ORGANIZATIONS: A CASE STUDY OF KENYA POWER

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Abstract

The purpose of this study was to assess the effect of e-procurement practices on supply chain performance in service organization. The objectives of the study were to determine the effect of e- tendering on service delivery in Kenya Power; to determine the effect of e-invoicing on service delivery in Kenya Power and to determine the effect of e- payment of services and products in Kenya power. The sample of the study was selected using simple random sampling technique. Data was collected using structured structures questionnaire which had close ended questions. The study used quantitative methods to analyze data. The information was codified and entered a spread sheet and analyzed using SPSS. Quantitative data was analyzed using descriptive statistical method; statistical tools such as mean, mode and standard deviation will be used. Inferential statistics such as Pearson correlation coefficients and multiple regression models were used. The study sought to determine the e-tendering practices and the supply chain performance in Kenya power Nakuru branch, the study concluded that the clients electronically submit their companies document for. The company also electronically evaluates new supplier capabilities, and the company electronically searches for new supplier client market. The company negotiates with the supplier through the internet. The study generally

concludes that e-tendering practices affect the supply chain performance in the company. The study also sought to assess the effect of e-invoicing on supply chain performance in Kenya Power Company.

Keywords: e-procurement, e-invoicing, performance, e-tendering, contemporary

INTRODUCTION

In contemporary society, service organizations are experiencing a rapid change when it comes to supply chain performance and as a result, they are rapidly re-evaluating their operating models and marketing strategies in order to withstand the market forces and also capitalize on them. Service organisations depends so much on procurement as it helps them to achieve their objectives and also prepare for future uncertainties. Advances in information technologies (IT) and information systems (IS). Web-based information systems enable several purchasing related activities to be managed electronically. Internet purchasing, which is business-to-business (B2B) at online marketplaces, and reverse auctions provide possibilities for e-procurement applications. This has enabled purchasing to shift its focus from day-to-day activities to strategic tasks, which can help organizations attain success in the face of turbulent environment.

E-procurement practices has therefore been introduced in the supply chain in order to improve its performance and reduce operational costs. It also helps organizations throughout the world deal with the few service providers chosen who offer better services and at the same time slash down the administration costs. This enable service organizations to attain high supply chain performance with innovative ideas and methods (Lenny Koh, Demirbag, Bayraktar, Tatoglu, & Zaim, 2007). The emergence of e-procurement practices has forced organizations to shift their operation from the traditional style to e-tendering, e-invoicing and e-payment so as to increase their competitive strength in their industries (Mose, 2012).

In the developed countries, such as the U.S, the automation of the Supply Chain process, e-Procurement is considered key and every organization has adopted it. It is considered to provide the organizations with various advantages such as improved supply chain performance and improved quality of services. The U.S government has made it mandatory for public institutions to adopt information technology such as e-procurement and e-supply in order to improve supply chain performance and reduce operational costs in the economy. Internet, with an added feature of multimedia advance processing capability in the 2000s, widely enabled and provided an essential resource for the automation of procurement. Supply chain practices cannot on their own improve efficiencies individually since the efficiency can only be achieved

through the interaction of various Supply Chain practices. Balal Ibrahim and Adam Hamid, (2012) claimed that for an effective Supply Chain performance, there should be a comprehensive effort to improvement all of Supply Chain functions within a firm, then focus on e-procurement practices by shifting from functional and independent system to general and integrative system. This implies that the performance of each Supply Chain practice should be evaluated depending on how the practice has a significant effect on the efficient integration of entire Supply Chain processes. Thus, the successful achievement of SC integration can be possible by the systematic utilization of various Supply Chain practice and centralized organizational structure (Chebolu-Subramanian & Gaukler, 2014).

In Africa, Manual procurement systems have been in use not only in the private sector but also in the public sectors. Instead of satisfying the need for goods, works, systems, and services in a timely manner, the procurement practices has proved to be long, cumbersome and time consuming. Most of these governments realized that this procurement practices has several deficiencies that contribute to huge losses in public funds. Some of the countries such as a Kenya, Tanzania and Ethiopia have introduced e-procurement practices in their public institutions but they have not managed to obtain the expected results because the Procurement personnel were not adequately trained and there was also lack of professionalism amongst themselves, and there was no professional body to oversee and install discipline among procurement officers. The Kenyan government has introduced e-procurement in service organization's in order to achieve high supply chain performance (Chebolu-Subramanian & Gaukler, 2014).

E- Procurement Practices

E- Procurement practices are those managerial actions undertaken to improve performance of the integrated supply chain. According to Chesire Barngetuny and Kimutai,(2015), E- procurement practices have been identified as e-tendering, e-invoicing and e-payment. The Public procurement consists of public sector supply chains and multi-level network, which can be assessed at their specific levels. The difference between these levels of procurement usually depends on the use of procurement practices as conducted by(Ngunyi, 2014). This differs from sector to sector and industry sector to sector, but they are standardized and regulated by one body. For instance, in Kenya, Public Procurement Oversight Authority (PPOA) regulates all public procurement practices.

According to Koh (2007), the Public Procurement Systems has evolved from a crude system with no regulations to an orderly legally regulated procurement system. The Director of Government Supply Services in Kenya was responsible for ensuring the proper observance of

the provisions of the Manual (Nyaboke, 2017).E- procurement practices are geared towards improving the performance of the supply chain by enhancing accountability and transparency with the aim of achieving value for money, and attracting investments by creating sound business climate (KINGOO, 2013).

It is evident from the study that these reforms have ensured fairness and competition among service providers, thereby restoring the confidence of Kenyans in the public procurement process while at the same time ensuring that there is effectiveness and efficiency in supply chains (Mugo, 2013). T Public Procurement Oversight Authority (PPOA) was created to oversee public procurement practices with its principal functions of ensuring that the public procurement law is complied with and capacity of the function among stakeholders is enhanced (Kenya Public Procurement Oversight Authority, 2010).

Supply Chain Performance

Supply chain performance is an overall performance measurement that depends on the performance of the supply chain stages. The performance of supply chain can be defined by supply chain profitability, which has only one source of revenue: the customer (Christopher, 2010).According to Ambe, (2014) supply chain performance is the degree to which a supply chain fulfils end user requirements concerning the relevant performance indicators at any point in time and at what total supply chain cost. Measurement of the entire supply chain performance is important because measurement affects decision making through the evaluation of past behaviour and through the opportunity of benchmarking. Insufficient scores on performance measures might lead to continuity problems in the short or long term, because decisions makers need information on the operations to guide their decisions. It is imperative to have a set of performance indicators at the supply chain level (Onsongo & Moronge, n.d.).According to Lambert and Pohlen, (2001) a well-defined supply chain measurement system increases the chance for success by aligning processes across multiple firms, targeting the most profitable markets, and obtaining a competitive advantage thro differentiated services and lower costs.

Broadbent, Laughlin, Folan and Browne, (2005) concludes that performance measurement as the feedback or information on activities with respect to meeting supply chain performance and strategic objectives. It reflects the need for improvement in areas with unsatisfactory performance. Thus efficiency and quality can be improved. Supply chain performance is vital in strategy formulation and communication and in forming diagnostic control mechanisms by measuring actual results (Omar & Sim, 2013). Essentiality of performance measurement in supply chain is vital. Shalle, Guyo and Amuhaya, (2013) mention the purpose

of e-procurement practices in meeting high standards of supply chain performance. Moreover, performance measurement is crucial for supply chain performance

Kenya Power

Kenya power (KPLC) is a public company listed in the Nairobi Stock Exchange(NSE). KPLC is the sole company responsible to procure, transmit, and to distribute electricity throughout Kenya (Limited, Office, Plaza, & Road, 2017). KPLC headquarters are at Stima Plaza, Kolobot Road in Parklands, Nairobi; it operates many offices throughout Kenya. In order to achieve its objectives, KPLC will require a proper procurement policy, planning and sustainable procurement practices. Procurement is the key ingredients that any institutions uses to get output or supply chain performance (Delivery, 2013). Bearing in mind that procurement practices is key to supply chain performance ("Annual International Supply Management Conference, May 2007," 2007) and account for 60% in Kenya and that the lack of electricity is link to poverty reduction. The maingoa of all energy transformations is to provide energy services that improve quality of life (health, life expectancy and comfort) and productivity(M. J. Davis, 2014a). Energy supply is intimately tied in with development in the broad sense. Poor service delivery of electricity can be justified by ineffective procurement practices within an organization.

Cherop, (2016) asserts that the contribution of procurement practices in facilitating an efficient and effective supply chain performance in service sector organizations is generally undisputed in both developed and developing countries. Awino and Nyaboke Marendi-Getuno, (2014)started that a sound public procurement practices needs to have good procurement laws and regulations. Procurement laws and regulations lead to procurement efficiency or inefficiency. Ideally, procurement practices should be clear, consistent, comprehensive, and flexible.

Statement of the Problem

Supply chain performance has become a critical factor for organizations success. in this regard most organizations have embraced e-procurement practices to enhance the supply chain performance. Embracement of electronic procurement has greatly simplified business purchasing operations by accommodating E-procurement in an organization the entire process especially purchasing leads to reduced cost of doing a business. Due to the reforms on the public procurement and disposal act 2005 which has led to the creation of public procurement and oversight authority. What followed was the implementation of e-procurement for the public sector. E-procurement was one of the medium term objectives according to the government strategy paper 2004 which were to be implemented in 2007, but the process has been slow.

There is need to have an automated procurement system which is interlinked and this will lead to enhanced competitiveness and reduced costs since manual processes are costly, slow, inefficient and storage of data and retrieval is poor. Evaluation of information sharing on E-procurement in an attempt to establish the factors influencing the adoption and impact of e-procurement practices (Nasidai, 2016). However, the studies did not provide any evidence on how e-procurement practices affects the supply chain performance, therefore this study will be undertaken to come up with the impact of e-procurement practices on supply chain performance in Kenya power, Nakuru county. There is need to contribute to literature gap on the link between e-procurement practices and supply chain performance in service organizations.

General Objective

The purpose of this study was to determine the effect of e-procurement practices on supply chain performance in service organizations; A case study of Kenya Power.

Specific Objectives

- i. To determine the effect of e- tendering on supply chain performance in Kenya Power.
- ii. To establish the effect of e-invoicing on supply chain performance in Kenya Power.
- iii. To determine the effect of e- payment on supply chain performance in Kenya power.
- iv. To determine the joint effect of e-tendering, e-invoicing and e-payment on supply chain performance in Kenya power.

Hypotheses of the Study

Ho₁. There is no significant effect between e- tendering and supply chain performance in Kenya Power.

Ho₂. There is no significant effect between e-invoicing and supply chain performance in Kenya Power.

Ho₃. There is no significant effect between e- payment and supply chain performance in Kenya power.

Ho₄: There is no significant effect between e-tendering, e-invoicing and e-payment on supply chain performance in Kenya power.

LITERATURE REVIEW

Innovation Diffusion Theory

Innovation diffusion theory was proposed by Sahin, (2006), the theory presents that innovation is a process aimed to improve performance hence high economic development.

According to innovation diffusion theory, innovation is defined as an idea perceived as new by individuals. Andreanne Léger Sushmita Swaminathan,(2007) defined innovation as all the scientific, technological, organizational, financial, and commercial activities necessary to create, implement, and market new or improved products or processes Innovation theory brings on board four important element. The first element is innovation that puts attention on the ability to come up with more efficient and better ways of doing things. This theory place the users of innovation into five types; innovators, 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. The 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.

According to innovation theory, rate of adoption of innovative strategies can be looked at in terms of; relative advantage given to the organization, compatibility, complexity, trial-ability of the new strategies and observability to the stakeholders within the social system. Secondly the communication that lays information and creating and sharing information relating to innovative initiatives in the organization. The third element is time that considers the duration involved in the innovation -decision process. The last element is the social context of the new systems (Letangule & Letting, 2012). Diffusion of innovation strategies requires evolution and reinvention of products and people so that they are able to perform better (Rotich, 2015). The concepts in this theory are very relevant to this study. They help build on the study and enable the researcher understand the expected relationship between the variables. While innovation diffusion theory depicts the understanding of the innovation process, it has a number of challenges. The theory does not foster a participatory approach. It is therefore only able to work best with adoption of behaviors. Lastly, the theory do not into account an organization's resources and social support in implementations of new methods.

Conceptual Framework

Conceptual framework is a detailed description of events which are under study by a graphical or visual depiction of the major variables of the study. The conceptual framework represents diagrammatical explanation or the relationship that exists between independent and dependent variable. The framework assists in determining the relation among variables thus granting better understanding of the situation at hand (Mugenda and Mugenda, 2008). According to the conceptual framework, the independent variables are E-tendering, E-invoicing and E-payment whereas dependent variables are Supply chain performance and its proxy are lead time, quality management and cost reduction.

Conceptual framework

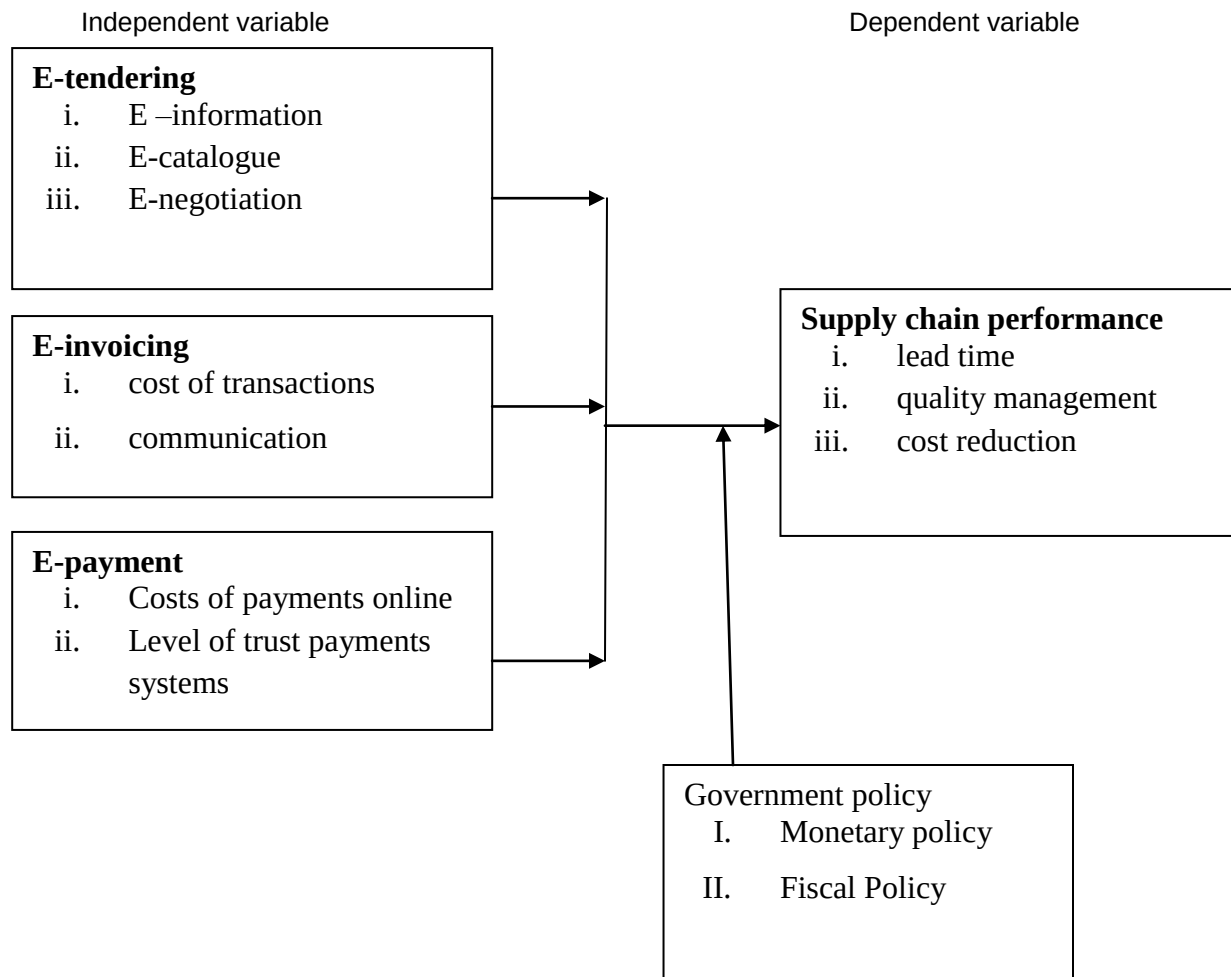


Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

Research Design

Research Design constitutes a blueprint for the collection, measurement, and analysis of data (Schindler, 2007). According to (Schindler, 2007) this is a comprehensive study of social unit, for example an individual, a group, social institution, district or a community. The study adopted a correlational-cross-sectional research design. Zheng (2015) stated that cross-sectional research design is a research approach in which a researcher investigates the state of affairs in a population at a certain point in time. The elements in the sample survey are selected at random to make inference about the population as a whole. The purpose of a correlational study is to establish whether two or more variables are related Williams (2007). This study employed descriptive research design

Target Population

Target population refers to the larger population to which the researcher ultimately would like to generalize the results of the study (Mugenda and Mugenda, 2008). It is thus the entire group of individuals, events or objects having common observable characteristics. The study population was drawn from 203 service providers within the company. The service providers are, designers, way leave contractors, surveyors and metering contractors.

Table 1 Target Population

Service providers	Target population
Designers	85
Way leave contractors	64
Surveyors	29
Metering contractors	25

Source (KPLC Nakuru 2026)

Sampling Size

Stratified random sampling design was used in the study in selecting the service providers in each sampling category. Tromps, (2006) points out that it involves dividing your population into heterogeneous job groups and taking a random sample in each group. This method is appropriate because it enables representation not only of the overall population but also the key sub groups of the population; it is also the best because it minimizes biasness. The total population of the service providers was used to determine the sample size since the population is high. The sample size is computed using Yamane's Formula;

$$n = \frac{N}{1 + N(e)^2}$$

Where; n = the desired sample size

e = probability of error (the desired precision, 0.05 for 95% confidence level).

N=the estimate of the population size.

$$n = \frac{203}{1 + 203(0.05)^2}$$

$$n = 135$$

The sub-sample of size for each service provider was determined using the formula by Krecjie and Morgan (1970) as follows:

$$s = \frac{XS}{P}$$

Where;

s= Sub-sample size for each service provider.

X = Population of each service providers.

S = Total sample size for the study.

P = Total population of all the the service providers.

The study used proportionate sampling to allocate the respondents.

Table 2 Sample Size

SERVICE PROVIDERS	POPULATION(X)	S	P	$s = \frac{XS}{P}$
Designers	85	135	203	$\frac{85*135}{203}=56$
Way leave	64	135	203	$\frac{64*135}{203}=43$
Surveyors	29	135	203	$\frac{29*135}{203}=19$
Metering contractors	25	135	203	$\frac{25*135}{203}=17$
Total	203			135

Data Collection Instruments

The study used a questionnaire consisting of closed-ended questions. The questionnaire was developed using the objectives. The questionnaire was made up of five sections namely: Section A will cover questions concerning the bio-data of the respondents; Section B contain items of E-tendering, while Section C was contain items of E-invoicing, while section D will contain E-payment, section E will contain items of supply chain performance. The items in Section B to E will be measured using a 5-point likert scale as follows: 5 - Strongly Disagree; 4 – Disagree; 3 – Uncertain; 2 – Agree; 1 - Strongly Agree

Validity and Reliability

The questionnaires were pretested to ensure it clarity and validity of the instrument. Validity is the extent to which an instrument can measure what it ought to measure. It therefore refers to the extent to which an instrument asks the right questions in terms of accuracy. Mugenda and Mugenda, (2008), defines validity as the accuracy and meaningfulness of inferences which are based on the results. The reliability of the study was determined by calculating Cronbach alpha coefficient. According to Tromps, (2006) the reliability coefficients around 0.9, is considered excellent, values around 0.8 as very good and values around 0.7 as adequate. A pilot study was carried out to determine the validity of the questionnaire, where the

responses of the subjects were checked against the research objectives. The questionnaire was pilot tested on twenty eight (28) respondents who are part of target population but not in the sample. This represents slightly above 10% of the accessible population that is generally recommended by social researchers. After pilot testing, the questionnaires will be revised to incorporate the feedback that was provided.

Reliability of an instrument is the measure of degree to which the research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 2008). In order to test the reliability of the instrument used in this study, the test-retest method was used, where the questions in questionnaire was asked in a twisted way but asking the same questions twice and this was part of the pilot testing within an interval of one weeks to establish whether the questionnaire elicit the same response.

Data Analysis and Presentation

The study used quantitative method to analyze data. The information was codified and entered into a spread sheet and analyzed using SPSS (Statistical package for social sciences). Quantitative data was analyzed using descriptive statistical method; the statistical tools such as mean, mode and standard deviation were used. The responses in the questionnaire were coded into common themes to facilitate analysis. Inferential statistic such as Pearson correlation coefficients and multiple regression models were used. Multiple regression analysis was employed to test the hypotheses. Multiple regression is presented below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \alpha$$

Where,

Y is the dependent variable (supply chain performance)

β_0 is the regression intercept

$\beta_1, \beta_2 \& \beta_3$ are the slopes of the regression equation

The independent variables are;

X_1 is e-tendering

X_2 is e-invoicing

X_3 is e-payment

α is Error term

FINDINGS

Descriptive Analysis of the Variables

The broad objective of this study was to the effect of e-procurement practices on supply chain performance in service organizations: a case study of Kenya power. In this regard the

study found it prudent to explore the effect of e- tendering, e-invoicing and e- payment on supply chain performance. Likert data collection instrument was used to collect primary data regarding the effect of e-procurement on supply chain performance. A five (5) point Likert scale (1=Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5=Strongly Agree) was used to measure the views of respondents. The upper and lower limits were set based on mean analysis of Likert scale data. A mean score of 1.0 - 1.80 depicted strongly disagree, 1.81 - 2.60 indicates slightly disagree while mean score of 2.61 - 3.40 indicates neutral, 3.41 - 4.20 indicates agree and 4.21 - 5.0 indicates strongly agree. In other words, a mean score of 3.40 and above indicates that the e-procurement influence supply chain management and mean score equal to or below 1.81 signifies it does not influence supply chain management

Table 3 Response categories and interpretation

Response	Weighting	Cut point limit	Interpretation
Strongly Agree	5	=>4.21 – 5.0	Strongly agree
Agree	4	=>3.41 – 4.20	Agree
Neutral	3	=>2.61 - 3.40	Neutral
Disagree	2	=>1.81 - 2.60	Disagree
Strongly Disagree	1	=>1.0 – 1.80	Strongly disagree

The first objective was to determine the effect of e- tendering on supply chain performance in Kenya Power. The findings are presented in Table 4.

Table 4 Tendering and Supply Chain Performance in Kenya Power

STATEMENT	N	MIN	MAX	MEAN	SD
The clients electronically submit their companies documents for prequalification	101	1	5	4.45	.781
The company electronically evaluate new supplier capabilities	101	1	5	4.31	.977
The company electronically searches for new supplier client market area	101	3	5	4.67	.512
The company gathers the demand proposals about procurement information or related information through the information system	101	2	5	4.54	.714
The company notifies the supplier on the arrival of an authorized procurement contract via the information system	101	3	5	4.53	.540

The company negotiates with the supplier through the internet	101	3	5	4.54	.539
The company confirms the procedures concerning daily purchases with the supplier through the internet	101	2	5	3.65	.921

The study sought to determine the e-tendering practices and the supply chain performance in Kenya power Nakuru branch, clients electronically submit their companies documents for prequalification registered a mean of 4.45 with a standard deviation of 0.871 and the maximum value being 5 and minimum being 1, the finding based on the mean of 4.45 agree that clients electronically submit their companies documents for prequalification. The company electronically evaluate new supplier capabilities recorded a mean of 4.31 with a standard deviation of 0.977 which implies that the company truly electronically evaluate new supplier capabilities, company electronically searches for new supplier client market area registered a mean of 4.67 and standard deviation of 0.512 which depicts company electronically searches for new supplier client market area, the company notifies the supplier on the arrival of an authorized procurement contract via the information system recorded a mean of 4.53 with a standard deviation of 0.540 which implies that company notifies the supplier on the arrival of an authorized procurement contract via the information system. The company negotiates with the supplier through the internet recorded a mean of 4.54 with a standard deviation of 0.539 which depicts that the company negotiates with the supplier through the internet and company confirms the procedures concerning daily purchases with the supplier through the internet recorded mean of 3.65 which implies that company confirms the procedures concerning daily purchases with the supplier through the internet but a moderate level. Generally the study establishes that e-tendering affect the supply chain performance in the company. The findings are summarized in table 5.

Table 5 Invoicing and Supply Chain Performance in Kenya Power

Statement	N	Min	Max	Mean	SD
The cost of printing or postage usage of orders has been reduced	101	3	5	4.71	.572
The effort and cost involved in the paper-based invoicing process has been minimized	101	4	5	4.85	.357
The Electronic invoicing is perceived as technically safe.	101	3	5	4.60	.511
There are no financial restrictions to adopt electronic invoicing in the company	101	2	5	4.45	.781

Through use of electronic invoicing the quality of the work increases	101	2	5	4.27	.882
The current invoices management system is not able to fulfill the communication requirement	101	2	5	3.48	.832

The study also sought to assess the effect of e-invoicing on supply chain performance in Kenya Power Company, the cost of printing or postage usage of orders has been reduced recorded a mean of 4.71 and standard deviation of 0.572 which implies cost of printing or postage usage of orders has been reduced, the effort and cost involved in the paper-based invoicing process has been minimized recorded a mean of 4.85 and standard deviation of 0.357, the maximum value was 5 while the minimum value was 4 which implies that effort and cost involved in the paper-based invoicing process has been minimized. There are no financial restrictions to adopt electronic invoicing in the company recorded a mean of 4.45 and the standard deviation of 0.781 which depicts that there are no financial restrictions to adopt electronic invoicing in the company while through use of electronic invoicing the quality of the work increases had a mean of 4.27 and the standard deviation of 0.882 and current invoices management system is not able to fulfill the communication requirement recorded a mean of 3.48 while its standard deviation was 0.832 which depicts that current invoices management system is not able to fulfill the communication requirement. The study findings postulates that e-invoicing positively affect the supply chain performance of Kenya power and lighting company Nakuru branch. The findings are summarized below.

Table 6 E-Payment and supply chain performance in Kenya Power

Statements	N	Min	Max	Mean	SD
E-payment encourages accountability among different stakeholders in the company	101	3	5	4.38	.705
Improves transparency in the procurement process	101	3	5	4.58	.515
Leads to better service delivery	101	3	5	4.54	.625
Temporary or sudden errors frequently occur during electronic payment system transaction.	101	2	5	4.15	.942
Electronic payment system provides a step to verify a payment before the finalization of the actual payment	101	4	5	4.38	.487
The company site offers an opportunity to change any of payment information before completing the	101	2	5	3.48	.832

final stage of the payment process					
The company's site typically displays a summary of the payment information (cost, payee.) and the final payment amount	101	2	5	3.60	.756

The study also determine the effect of e-payment on supply chain performance in Kenya power Nakuru branch, E-payment encourages accountability among different stakeholders in the company registered a minimum value of 3 while maximum value was 5, the mean and standard deviation was 4.38 and 0.705 respectively, the findings implies that e-payment encourages accountability among different stakeholders in the company, the study also assessed if e-payment improves transparency in the procurement process, the study recorded a mean of 4.58 and standard deviation of 0.515 which implies that e-payment improves transparency in the procurement process. Electronic payment system provides a step to verify a payment before the finalization of the actual payment registered a mean of 4.38 with a standard deviation of 0.487 which implies that electronic payment system provides a step to verify a payment before the finalization of the actual payment. The company site offers an opportunity to change any of payment information before completing the final stage of the payment process registered a mean of 3.48 and the standard deviation of 0.832 which the findings implies that The company site offers an opportunity to change any of payment information before completing the final stage of the payment process. The company's site typically displays a summary of the payment information (cost, payee.) and the final payment amount records a mean of 3.60 which postulates that the company's site typically displays a summary of the payment information (cost, payee.) and the final payment amount. The findings are summarized in table 7.

Table 7 Supply Chain Performance

Statement	N	Min	Max	Mean	SD
The company manages costs well	101	3	5	4.57	.554
The company manages cash turnover well	101	3	5	4.48	.610
The company has sufficient material availability for the stakeholders	101	3	5	4.17	.549
The company manages lead time well	101	3	5	4.46	.641
The company manages product and service quality well	101	2	5	4.39	.648
The company is able to communicate real time information with the clients	101	4	5	4.51	.502
Valid N (listwise)	101				

In table 7 the study assessed the elements of supply chain performance, company manages costs well recorded a mean of 4.57 with a standard deviation of 0.554 which implies that when company manages the costs well then supply chain performance will improve. The study also assessed if the company manages cash turnover well and it recorded a mean of 4.48 with a standard deviation of 0.610 which implies that company manages cash turnover well and this will improve performance, company has sufficient material availability for the stakeholders registered a mean of 4.17 while the standard deviation was 0.549 which implies that company has sufficient material availability for the stakeholders. The company manages product and service quality well recorded a mean of 4.39 and standard deviation of 0.648 and the company is able to communicate real time information with the clients recorded a mean of 4.51 and the standard deviation of 0.502 which implies that company is able to communicate real time information with the clients and this positively affect the supply chain performance in the company.

Diagnostic Tests

Reliability Test

Cronbach's alpha coefficient which is used to assess the internal consistency among research instrument items was used. Sekeran (2006) posits that any values between 0.5 and 0.8 are adequate for internal consistency. This study adopted an alpha of 0.7 as lowest limit. The alpha values of the research instrument are shown in Table 8.

Table 8 Reliability Test Results

Variable	Cronbach's Alpha	No of Items	Conclusion
E-tendering	.907	7	Reliable
E-invoicing	.736	6	Reliable
E-payment	.893	7	Reliable

The reliability coefficients (α) of each variable are as follows: e-tendering (0.907); e-invoicing (0.736); e-payment (0.893). The reliability coefficients of all the variables were above 0.70. This was consistent with (Sekaran, 2006) who argued that a value of 0.70 is recommended, and therefore the measurement scale had a high level of internal consistency.

Test for Multicollinearity

The test for multicollinearity was conducted to assess whether one or more of the variables of interest is highly correlated with one or more of the other independent variables.

The variance inflation factor (VIF) was used to evaluate the level of correlation between variables and to estimate how much variance of a coefficient was inflated because of linear dependence with other predictors. The results for multicollinearity test were presented in table 9.

Table 9 Results for Tests of Multicollinearity

Model	Collinearity Statistics	
	Tolerance	VIF
E-Invoicing	.602	1.662
E-Payment	.579	1.726
E-tendering	.765	1.307

a. Dependent Variable: Supply Chain Performance

The results in Table 9 revealed that there was no serious problem with multicollinearity, the variance inflation factors for the variables were between 1.307 and 1.726, meaning that the variables were not highly correlated since tolerance values were above 0.1 and VIF did not exceed 10. This is an assurance that the regression coefficients were stable hence valid significance test.

Correlation Analysis

Table 10 Correlation Matrix

		Supply Chain Performance	E-tendering	E- Invoicing	E- Payment
Supply Chain Performance	Pearson Correlation	1	.642**	.562**	.444**
	Sig. (2-tailed)		.000	.000	.000
	N	101	101	101	101
E-tendering	Pearson Correlation	.642**	1	.416**	.451**
	Sig. (2-tailed)	.000		.000	.000
	N	101	101	101	101
E-Invoicing	Pearson Correlation	.562**	.416**	1	.611**
	Sig. (2-tailed)	.000	.000		.000
	N	101	101	101	101
E-Payment	Pearson Correlation	.444**	.451**	.611**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	101	101	101	101

** . Correlation is significant at the 0.01 level (2-tailed).

Regression Results

To determine the effect of e- tendering on supply chain performance in Kenya Power

The first objective of the study was to determine the effect of e- tendering on supply chain performance in Kenya Power. The findings are summarized in tables below.

Table 11 Model Summary of e-tendering

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642 ^a	.412	.406	.32868

a. Predictors: (Constant), E-tendering

R squared is the coefficient of determination which reveals that the variation in dependent variable is due to changes in independent variables.

Research findings on table 11 shows R squared was 0.412 and it shows that the total variation of 41.2 % in supply chain performance can be explained by variation in e-tendering. This means that other factors not included in the study accounted for 48.8 %. The study also depicted a strong correlation coefficient of e-tendering on supply chain performance in the firm.

Table 12 ANOVA for E-tendering

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.491	1	7.491	69.339	.000 ^b
Residual	10.695	99	.108		
Total	18.185	100			

a. Dependent Variable: Supply Chain Performance
b. Predictors: (Constant), E-tendering

ANOVA of the e-tendering that are included to explain the supply chain performance of KPLC. The findings revealed F value of 69.339, which was statistically significant at 0.000.

This further indicates that the independent variable used (e-tendering) is statistically significant in predicting supply chain performance at 95% significance level. ANOVA analysis was used to show the significance of the regression model adopted in the study.

Table 13 Regression Coefficient of e-tendering

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.180	.149		21.411	.000
E-tendering	.280	.034	.642	8.327	.000

a. Dependent Variable: Supply Chain Performance

Derived multiple regression equation from the data in the table 13 was:

$$Y = 3.180 + 0.280X_1$$

The coefficients or beta weights for each variable allowed the researcher to compare the relative importance of each independent variable. The beta values indicate the direction of the relationship. A positive sign indicates a positive relationship while a negative sign indicates a negative relationship. In this study the unstandardized coefficients and standardized coefficients are given for the multiple regression equations. However discussions are based on the unstandardized coefficients. Holding e-tendering constant supply chain performance would be 3.180. Independent variable from the regression equation reveals that a unit increases in e-tendering led to an increase in supply chain performance by 0.280 units.

To establish the effect of e-invoicing on supply chain performance in Kenya Power

Table 14 Model summary of E-invoicing

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562 ^a	.316	.309	.35440

a. Predictors: (Constant), E-Invoicing

R squared is the coefficient of determination which reveals that the variation in dependent variable is due to changes in independent variables. Research findings on table 14 shows R squared was 0.316 and it shows that the total variation of 31.6 % in supply chain performance can be explained by variation in e-invoicing. This means that other factors not included in the study accounted for 68.4%. The study also depicted a strong correlation coefficient of e-invoicing on supply chain performance in the firm as shown by R (0.562).

Table 15 ANOVA of e-invoicing

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.751	1	5.751	45.792	.000 ^b
	Residual	12.434	99	.126		
	Total	18.185	100			

a. Dependent Variable: Supply Chain Performance

b. Predictors: (Constant), E-Invoicing

Table 15 presents the analysis of variance (ANOVA) of the e-invoicing that are included to explain the supply chain performance. The findings revealed F value of 45.792, which was statistically significant at 0.000. This further indicates that the independent variable used (e-invoicing) is statistically significant in predicting supply chain performance at 95% significance level. ANOVA analysis was used to show the significance of the regression model adopted in the study.

Table 16 Coefficient of E-invoicing

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.917	.367		5.228	.000
E-Invoicing	.562	.083	.562	6.767	.000

a. Dependent Variable: Supply Chain Performance

Derived multiple regression equation from the data in the table 16 was:

$$Y = 1.917 + 0.562X_2$$

The coefficients or beta weights for each variable allowed the researcher to compare the relative importance of each independent variable on the dependent variable. The beta values indicate the direction of the relationship. A positive sign indicates a positive relationship while a negative sign indicates a negative relationship. Holding e-invoicing constant supply chain performance would be 1.917. Independent variable from the regression equation reveals that a unit increases in e-invoicing led to an increase in supply chain performance by 0.562 units.

To determine the effect of e- payment on supply chain performance in Kenya power

Table 17 Model Summary of e-payment

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.444 ^a	.197	.189	.38395

a. Predictors: (Constant), E-Payment

Research findings on table 17 shows R squared was 0.197 and it shows that the total variation of 19.7 % in supply chain performance can be explained by variation in e-invoicing. This means that other factors not included in the study accounted for 80.3%. The study also depicted a weak correlation coefficient of e-payment on supply chain performance in the firm as shown by R (0.44).

Table 18 ANOVA of E-payment

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.591	1	3.591	24.358	.000 ^b
	Residual	14.595	99	.147		
	Total	18.185	100			

a. Dependent Variable: Supply Chain Performance b. Predictors: (Constant), E-Payment

Table 18 presents the analysis of variance (ANOVA) of the e-payment that is included to explain the supply chain performance. The findings revealed F value of 24.358, which was statistically significant at 0.000. This further indicates that the independent variable used (e-payment) is statistically significant in predicting supply chain performance at 95% significance level. ANOVA analysis was used to show the significance of the regression model adopted in the study.

Table 19 Coefficient of E-payment

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.565	.371		6.915	.000
E-Payment	.436	.088	.444	4.935	.000

a. Dependent Variable: Supply Chain Performance

Derived multiple regression equation from the data in the table 19 was:

$$Y = 2.565 + 0.436X_3$$

The coefficients or beta weights for each variable allowed the researcher to compare the relative importance of each independent variable on the dependent variable. The beta values indicate the direction of the relationship. A positive sign indicates a positive relationship while a negative sign indicates a negative relationship. Holding e-payment constant supply chain performance would be 2.565. Independent variable from the regression equation reveals that a unit increases in e-payment led to an increase in supply chain performance by 0.436 units.

Multiple Linear Regression Analysis

Table 20 shows the results on the multiple linear regression analysis the effect of e-procurement on supply chain performance.

Table 20 Model Summary- Multiple regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.719 ^a	.518	.503	.30074

a. Predictors: (Constant), E-Payment, E-tendering , E-Invoicing

R squared is the coefficient of determination which reveals that the variation in dependent variable is due to changes in independent variables. Research findings on table 20 above shows R squared was 0.518 and it shows that the total variation of 51.8% in supply chain performance of the firm can be explained by variation in E-payment, E-Invoicing, E-tendering. This means that other factors not included in the study accounted for 48.2%. R is the coefficient of variation between the research study variables. There were strong relationship between research study variables as shown by above (R=0.719)

Table 21 ANOVA- Multiple Regression

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.412	3	3.137	34.688	.000 ^b
	Residual	8.773	97	.090		
	Total	18.185	100			

a. Dependent Variable: Supply Chain Performance

b. Predictors: (Constant), E-Payment, E-tendering , E-Invoicing

Table 21 presents the analysis of variance (ANOVA) of e procurement practices that are included to explain the supply chain performance. The findings revealed F value of 34.688, which was statistically significant at 0.000. This further indicates that the independent variables used (E-Payment, E-tendering, E-Invoicing) are statistically significant in predicting supply chain performance at 95% significance level. ANOVA analysis was used to show the significance of the regression model adopted in the study.

Table 22 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.882	.337		5.581	.000
E-tendering	.215	.035	.492	6.102	.000
E-Invoicing	.354	.091	.354	3.897	.000
E-Payment	.006	.091	.006	.064	.949

a. Dependent Variable: Supply Chain Performance

Derived multiple regression equation from the data in the table 22 was:

$$Y = 1.882 + 0.215X_1 + 0.354X_2 + 0.006X_3$$

Holding E-payment, E-Invoicing, E-tendering constant procurement performance would be 1.882 Independent variables from the regression equation reveal that a unit increases in e-tendering led to an increase in supply chain performance by 0.215 units. In addition, a unit increases in e-invoicing led to an increase of supply chain performance by 0.354 units. Also, a unit increase in e-payment led to an increase in supply chain performance by 0.006 units. This finding postulates a positive relationship between the independent variable and the dependent variables.

Test of Hypotheses

As a result, the key idea behind tests of significance is that of a test statistic and the sampling distribution of such a statistic under the null hypothesis (Gujarati, 2004). In the case of t-test, t distribution is used, and a statistic is considered to be statistically significant if the value of the test statistic lies in the critical region, in which case the null hypothesis is accepted. In all the tests, the decision rule was if the P value observed (calculated P) is less than the set alpha (α) that is the confidence level of 0.05, then fail to reject the null hypothesis and if the P value

observed is greater than the set alpha of 0.05, do reject the null hypothesis. The testing of these hypotheses was done at level of significance of 0.05.

Ho1: There is no significant effect between e- tendering and supply chain performance in Kenya Power

From the above findings, the e-tendering has positive and significant effect on supply chain performance (Beta value=-0.215, $p=0.000$) a minimum of 95% confidence level. This implies that e-tendering positively affect the supply chain performance in Kenya power company. The above results thus lead to rejecting the null Hypothesis H_{01} that there is no significant effect between e- tendering and supply chain performance in Kenya Power. The findings are summarized in table 22.

Ho2: There is no significant effect between e-invoicing and supply chain performance in Kenya Power.

As presented in table 22, from the above findings, the study found out e-invoicing has a positive significant effect on supply chain performance in Kenya Power ($B=0.354$) and p value was 0.000 at minimum of 95% confidence level. This depicts that e-invoicing positively affect the supply chain performance of Kenya power company. The above results thus lead to rejecting the null Hypothesis H_{02} that there is no significant effect between e-invoicing and supply chain performance in Kenya Power.

Ho3: There is no significant effect between e- payment and supply chain performance in Kenya power.

As it presented in table 22, e-payment had a positive but no significant effect on supply chain performance in Kenya power ($p=0.949$) and beta value of 0.006 with a minimum of 95% confidence level. The above results thus lead to failing to reject the null Hypothesis H_{03} ; there is no significant effect between e- payment and supply chain performance in Kenya power.

Ho4: There is no significant effect between e-tendering, e-invoicing and e-payment on supply chain performance in Kenya power.

As it presented in table 22, e-tendering, e-invoicing and e-payment had a positive and significant effect on supply chain performance in Kenya power ($p=0.000$) with a minimum of 95% confidence level. The above results thus lead to rejecting the null Hypothesis H_{04} ; there is no significant effect between e-tendering, e-invoicing and e-payment on supply chain performance in Kenya power.

CONCLUSION

The study concluded that e-invoicing has a positive significant effect on supply chain performance in Kenya Power. The Government, through the relevant ministry, should institute policies concerning data handling to enhance the application of electronic procurement practices between the buyers and suppliers. This will improve the electronic payment, and use of electronic signature acceptance. Further the firms should provide the supplier with access to credentials for the supplier portal. This will increase users' access to information in the electronic procurement process with effective internet and thus an increase in chances of selecting the best supplier company for electronic tendering. The study established that E-invoicing 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, and 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.

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QUESTIONNAIRE

Section A: General Information

From the following questions provided, please tick (✓) where appropriate.

Provide the following information

2. Gender: Male ☐ Female ☐

3. Age in Years;

20 Years and below ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ Above 50 ☐

4. Please indicate the highest level of education you have attained.

Certificate ☐ Degree/ Higher Diploma ☐ Master ☐

5. How long have you been a client of Kenya Power?

One year ☐ Two years ☐ Three years ☐ Four years ☐ More than four years ☐

Section B: E-Tendering

In this section the study is interested in your view about e-tendering. Read each of the statements carefully and tick the appropriate choice. Key 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1 – Strongly agree

	1	2	3	4	5
The clients electronically submit their companies documents for prequalification					
The company electronically evaluate new supplier capabilities					
The company electronically searches for new supplier client market area					
The company gathers the demand proposals about procurement information or related information through the information system					
The company notifies the supplier on the arrival of an authorized procurement contract via the information system					
The company negotiates with the supplier through the internet					
The company confirms the procedures concerning daily purchases with the supplier through the internet					

Section C: E-Invoicing

In this section the study is interested in your view about e-invoicing. Read each of the statements carefully and tick the appropriate choice.

Key 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1 – Strongly agree

	1	2	3	4	5
The cost of printing or postage usage of orders has been reduced					
The effort and cost involved in the paper-based invoicing process has been minimized					
The Electronic invoicing is perceived as technically safe.					
There are no financial restrictions to adopt electronic					

invoicing in the company					
Through use of electronic invoicing the quality of the work increases					
The current invoices management system is not able to fulfill the communication requirement					

Section D: E-Payment

In this section the study is interested in your view about e-payment. Read each of the statements carefully and tick the appropriate choice.

Key 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1 – Strongly Agree

	1	2	3	4	5
E-payment encourages accountability among different stakeholders in the company					
Improves transparency in the procurement process					
Leads to better service delivery					
Temporary or sudden errors frequently occur during electronic payment system transaction.					
Electronic payment system provides a step to verify a payment before the finalization of the actual payment					
The company site offers an opportunity to change any of payment information before completing the final stage of the payment process					
The company's site typically displays a summary of the payment information (cost, payee.) and the final payment amount					

Section E: Supply Chain Performance

In this section the study is interested in your view about supply chain performance. Read each of the statements carefully and tick the appropriate choice.

Key 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1 – Strongly Agree

	1	2	3	4	5
The company manages costs well					
The company manages cash turnover well					
The company has sufficient material availability for the stakeholders					
The company manages lead time well					
The company manages product and service quality well					
The company is able to communicate real time information with the clients					