



Drivers of E- Procurement Optimization in Government Parastatals in Kenya: A Case of Kenya Power Company

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ABSTRACT

The study sought to examine the drivers of E-procurement optimization in government parastatals in Kenya, a case study of Kenya Power Ltd as its general objective.. The study was conducted through a descriptive research design 85 procurement staff based at the headquarters was used as it was guided by research questions based on the objectives aforementioned. Literature related to this study was reviewed based on the variables too. Questionnaires were used as the main data collection instruments and a pilot study was undertaken to pretest the questionnaires for validity and reliability. Descriptive statistics were used aided by Statistical Package for Social Scientists (SPSS) Version 22 to compute percentages of respondents' answers. Inferential statistics such as multiple regression analysis was applied to aid examining the relationship between the research variables at 5% level of significance. Tables, graphs and charts were used to present the analyzed results. It is notable that there exists a strong positive relationship between the independent variables and dependent variable as shown by R value (0.867).The coefficient of determination (R^2) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable and the four independent variables that were studied explain 76.90% of the E-procurement optimization in government parastatals as represented by the R^2 .This therefore means that other factors not studied in this research contribute 23.10% to the E-procurement optimization in government parastatals. This implies that these variables are very significant therefore need to be considered in any effort to boost E-procurement optimization in government parastatals in Kenya. The study therefore identifies variables as critical drivers of E-procurement optimization in government parastatals in Kenya. According to the regression equation established, taking all factors into account (Information communication and technology, training, supplier/buyer integration and legal framework) constant at zero E-Procurement optimization in government parastatals was 13.876..At 5% level of significance, information communication and technology had a 0.000 level of significance; training show a 0.001 level of significance, supplier/buyer integration show a 0.003 level of significance and legal framework show a 0.004 level of significance hence the most significant factor was information communication and technology. Thus, the findings of this study serve as a basis for future studies on drivers of E-procurement optimization in government parastatals in Kenya. The study has contributed to knowledge by establishing that ICT, training, supplier/buyer integration and legal framework influence E-procurement optimization in government parastatals in Kenya in the Kenyan context.

Keywords: E-procurement, government parastatals, information communication technology

INTRODUCTION

Electronic procurement is an ever-growing means of conducting business in many industries, around the world and is projected to reach \$3trillion in transaction this year, up from \$75 billion in 2002 (Venkatesh, 2010). In their discussion of competitive purchasing strategies required for the twenty first century (Morosan &Jeong, 2008) stated that firms must maximize the use internet based technologies (including e-procurement) in every aspect of the business, linking across all members of the supply chain, increasing the speed of information transfer and reducing non-value adding tasks. Clearly, the use of electronic procurement is a relatively recent phenomenon; therefore a sound for electronic procurement strategy does not exist. The construct, "electronic procurement strategy" examined in this research represents a theoretical fusion of organizational moves and management approaches used to achieve organizational objectives and to pursue the organizational objectives and to pursue the organization's mission (Shakir, 2007).

The electronic procurement system or e-procurement as it is called involves purchase and sale of products, supplies and services through the various networking systems such as electronic data interchange and internet. E-procurement does not mean just online purchasing decisions. It involves connecting the suppliers and employees of the organizations into the purchasing network companies that embark on e-procurement buying programs will be able to aggregate purchasing across multiple departments or divisions without removing individual control, reduce rogue buying, can get the best price and quality products from a wide range of suppliers. For the suppliers, E-procurement is a boom because they can be very proactive in their business proceedings. The advent of cloud computing concepts and using the cloud process for e-procurement has automated the procurement process further. The management of agreements and contracts, price list verification product, comparisons, article selection has not only become simplified but also speedy (Chau, 2006).

The impact of web based technology has added value/speed to all the activities and avenues of business in today's dynamic global competition. The ability to provide customers with cost effective total solution and life cycle costs for sustainable value has become vital. Business organizations are now under tremendous pressure to improve their responsiveness and efficiency in terms of product development, operations and resource utilization with transparency. With the emerging application of internet and information technology (ICT) the companies are forced to shift their operations from traditional way to a virtual e-procurement and supply chain philosophy to transfer the company's activity to automated one (Carabello,2007).

Global Perspective of E-Procurement Optimization

Worldwide, public sector procurement has become an issue of public attention and debate, and has been subjected to reforms, restructuring, rules and regulations. Public procurement refers to the acquisition of goods, services and works by a procuring entity using public funds (World Bank, 2009). According to Roodhooft and Abbeele (2006), public bodies have always been big purchasers, dealing with huge budgets. Mahmood, (2010) also reiterated that public procurement represents 18.42% of the world GDP. Although several developing countries have taken steps to reform their public procurement systems, the process is still shrouded by secrecy, inefficiency, corruption and undercutting. In all these cases, huge amounts of resources are wasted (Arrowsmith, 2010).

In many countries e-procurement is now a widely preferred option and it is believed that besides improving efficiencies it has also given businesses a better chance to reach the unexplored markets. Through e-procurement businesses have reduced their high-spending on their manufacturing costs and have had positive impact on their profitability in such way as now with the aid of web-based portals or exchanges many businesses can easily post their requirements or request for quotations (RFQs) online and in turn they get quotations from suppliers around the world without any hassle giving them so many options to choose the best and in most cost effective one (Sheng, 2002).

In Europe's most developed states, there are operational strategies that can drive forward research and innovation by harnessing its large expenditure on civil public procurement. Representing 16.3% of European GDP, supply chain in the public sector is both a key source of demand for firms in sectors such as construction, health care, environment, security and transport, and a major area in which governments are striving to improve effectiveness. By providing lead markets for new technologies, public authorities can give firms the incentive to invest in research in the knowledge that an informed customer is waiting for the resulting competitive innovations. At the same time, this opens up opportunities to improve the quality and productivity of public services through the deployment of innovative goods and services (Barney, 2008).

Regional Perspective of E-Procurement Optimization

In developing countries, E-procurement optimization in public sector is increasingly recognized as essential in service delivery (Basheka and Bisangabasaija, 2010), and it accounts for a high proportion of total expenditure. For instance, public procurement accounts for 60% in Kenya (Akech, 2005), 58% in Angola, 40% in Malawi and 70% of Uganda's public spending (Wittig, 2006; Government of Uganda, 2006) as cited in Basheka and Bisangabasaija (2010). This is very high when compared with a global average of 12-20 % (Frøystad *et al.*, 2010). Due to the colossal amount of money involved in government procurement and the fact that such money comes from the public, there is need for accountability and transparency (Hui *et al.*, 2011).

As the East African Community (EAC) member states prepare to improve their procurement systems by adopting the e-procurement platform, the element of having legislative structures that will monitor

and allow for an effective implementation of the systems is still an impediment to its success Murambi (2005). Recently, the East African community converged in Nairobi to discuss the challenges and opportunities arising from this new system that is expected to promote transparency and ensure efficiency during procurement transactions (R.o.K, 2010).

Local Perspective of E-Procurement Optimization

According to (Oke et al, 2006) e-procurement in Kenya is at the early adoption stage. Very few companies and state corporations have the pre-requisite ICT infrastructure that is necessary for the implementation of e-procurement. This has been attributed to the astronomical costs that are involved in the setting up of the infrastructure as well the skill gap that exists in the labor market. The government of Kenya considers ICT as a key pillar in the success of vision 2030 which aims at transforming the country into an industrialized nation by the year 2030. To this end, a fully fledged ICT board has been set up by the government to spearhead the ICT revolution in the country which is a positive signal for e-procurement (Oke et al, 2006). By April 2008, there were 73 registered ISPs, 16 of which were active approximately 1,500,000 internet users and over 1000 cyber cafes. There were also about 800,000 personal computers in active use.

A research by Handfield (2003) revealed that in Kenyan market, conducting e-procurement is mostly meant for provisions that enable firms to identify trading partners that they could contact off-line with a view of doing business. The follow-up to an initial contact generally is taking place through other channels such as e-mail, hyperlink, the telephone, fax or the post. According to (Kim et al, 2008), only 33% of firms in private sector have implemented e-procurement strategy to improve services in Kenya. It would therefore be of importance to identify the underlying factors impeding the private and public sector in Kenya from integrating their procurement activities electronically so that they can achieve the full benefit of e-procurement.

Concept of E- Procurement Optimization

This refers to the act of increasing the performance of online based purchasing in the organization. The aim of optimizing the system operation is mainly because of, increased transparency, increased efficiency, improved transparency, enhanced risk management, higher levels of integrity, greater and better access to government procurement for small and medium size enterprises, corruption avoidance and cost reductions as compared to traditional manual procurement (Johnson & Wichern, 2010)

In the past procurement, at one time, was traditionally carried out by visiting a store and then following the procedures for placing an order. The process of procurement traditionally involved manual procedures and the transactions were often slow processes. The traditional procurement processes form the basis for the introduction of e-procurement to the system. The emergence of internet meant that companies started turning their procurement activities towards internet since it would benefit them if all procurement processes are carried out correctly, efficiently and properly (Radford, 2010).

Electronic procurement refers to the business-to-business or business-to-consumer or business-to-government 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 also refers to the transformation from paper based buying process of public entities to an internet based process (Dooley & Purchase, 2006).

The benefits of e-procurement optimization are, increased efficiency, improved transparency, enhanced risk management, higher levels of integrity, greater and better access to government procurement for small and medium size enterprises, corruption avoidance and cost reductions as compared to traditional manual procurement (Radford et al, 2010).

While there are various forms of e-Procurement that concentrate on one or many stages of the procurement process such as e-Tendering, e-Marketplace, e-Auction/Reverse Auction, and e-Catalogue/Purchasing, e-Procurement can be viewed more broadly as an end-to-end solution that integrates and streamlines many procurement processes throughout the organization. Although the term end-to-end e-Procurement is popular, industry and academic analysts indicate that this ideal model is rarely achieved and e-Procurement implementations generally involve a mixture of different models (Frankwick et al., 2014).

1.2 Statement of the Problem

Government parastatals play a major role in the development of the country through provision of public services and have become a strong entity in Kenya and very useful engines to promoting

economic and social development. In Kenya government parastatals accounted for 23% of the country's Gross Domestic Product (GDP), provided employment opportunities to about 4500,000 people in the formal sector and 3.7 million persons in the informal sectors of the economy (GOK, 2013). However, in addition, State Corporations in Kenya has been experiencing a myriad of problems including corruption, nepotism and mismanagement (R.o.K, 2009). For example a world bank report (2013) stated that a key area for corruption busting reform is the parastatal sector which when compared to similar economies are a drain on public resources and are locus of corruption that thrives in public monopolies especially when coupled with lax oversight, mismanagement and fiduciary control procedures.

Mahmood (2010) also reiterated that parastatal sector represents 18.42% of the world GDP. In Kenya, the central government spends about Kshs. 234 billion per year on procurement. However, on annual bases, the government losses close to Ksh. 121 billion about 17 per cent of the national budget due to inflated poor E-procurement optimization especially through the parastatal sector (KISM 2010). According to Public Procurement Oversight Authority (PPOA 2009), most of the tendered products/services in the parastatal sector have a mark-up of 60 per cent on the market prices. The inefficiency and ineptness of overall implementation of e-optimization in many government parastatals contributes to loss of over Ksh.50 million annually (Tom, 2012). For example government parastatals operations had become inefficient and non profitable, partly due to multiplicity of objectives, stifled private sector initiatives and failing of joint ventures requiring the government to shoulder major procurement burdens (McCrudden, 2004). 31% of state corporations rely on old records in selecting their suppliers, while 69% research through internet catalogue in selecting suppliers (Chau et al 2007). Due to the colossal amount of money involved in government procurement and the fact that such money comes from the public, there is need for accountability and transparency by the adoption of E-optimization (Hui *et al.*, 2011). A study by (Chan & Lu, (2004) found that organizations which adopted e-procurement strategies have reduced costs through transactional and process efficiencies and thereby promoting their procurement performance.

Lai & Li, (2005), in Singapore, previous research on the survey of the role of e-procurement adoption strategy shows that global state corporation use of the internet is high, while in Kenya, previous research by Kim et al, (2008) on usage, obstacles and policies on e-procurement show that only 33% of state corporations have implemented e-procurement as a strategy to improving services. The big question is the use of e-procurement optimization as a strategy to enhance of the performance of the procurement function, but none of the existing research explores further the determinants of e-procurement optimization in the public sector. It is on this premise the study sought to establish the drivers of E-Procurement optimization government parastatals in Kenya specifically Kenya Power Ltd.

Objectives of the Study

The general objective of this study was to examine the drivers of E-procurement optimization in government parastatals in Kenya.

The specific objectives of the study were to:

- i. To establish how information communication technology influence E-procurement optimization in government parastatals in Kenya
- ii. To determine how training influence E-procurement optimization in government parastatals in Kenya
- iii. To find out how supplier/buyer integration influence s E-procurement optimization in government parastatals in Kenya
- iv. To assess how legal framework influence E-procurement optimization in government parastatals in Kenya.

Research Questions

The study sought to be guided by the following research questions:

- i. How does information communication technology influence E-procurement optimization in government parastatals in Kenya?
- ii. How does training influence E-procurement optimization in government parastatals in Kenya?
- iii. To what extent does supplier/buyer integration influence E-procurement optimization in government parastatals in Kenya?

- iv. How does legal framework influence E-procurement optimization in government parastatals in Kenya?

LITERATURE REVIEW

Theoretical Review

There are several theories that have been developed to try and understand the determinants of E-procurement optimization in government parastatals in Kenya. Some of the theories discussed include:

E-Technology Perspective Theory

E-procurement lacks an overarching definition and encompasses a wide range of business activities. For example, (Choi & Rungtusanatham, 2001,) state that e-procurement remains a first generation concept aimed at buyers, which should progress into e-sourcing and ultimately into e-collaboration. E-collaboration allows customers and suppliers to increase coordination through the internet in terms of inventory management, demand management and production planning (Lee, 2003). This facilitates the so-called frictionless procurement paradigm (Brousseau, 2000). This research recognizes the extensive nature of e-procurement and uses the definition provided by (Min & Galle 2002,) where e-procurement is a business-to-business (B2B) purchasing practice that utilizes electronic procurement to identify potential sources of supply, to purchase goods and service, to transfer payment, and to interact with suppliers. The authors believe that this definition provides the scope to investigate the basic level of e-procurement in the Irish ICT manufacturing sector. E-procurement implementation is characterized by the direct and indirect procurement divide, where firms tend to use online systems for uncritical items (Min & Galle, 2001). The transition to modern e-procurement calls for strategic adaptation. It is one strategy, though, that requires much organizational change (Macinnis & Jaworski, 2009). The above theory instigated the first research question: How does ICT affect E-Procurement optimization in government parastatals.

Scientific Management Theory

To investigate the influence of training on E-Procurement optimization in government parastatals, the study will be based on scientific management theory. The theory basically consists of the works of Fredrick Taylor. Fredrick Taylor started the era of modern management in the late nineteenth and early twentieth centuries; Taylor consistently sought to overthrow management by rule of thumb and replace it with actual timed observations leading to the one best practice Watson (2012).

According to Watson (2012) scientific management is essential for procurement management as it aims to improve methods of procurement. This is especially relevant in the public sector where there is constant demand for uniformity of treatment, regularity of procedures and public accountability for operations. Scientific management in this case would ensure adherence to specific procurement rules and procedures. One of the principles of scientific management as forwarded by Taylor is performance standard Taylor found out that there were no scientific performance standards. No one knew exactly how much work a worker should do in one hour or in one day. The work was fixed assuming rule of thumb or the amount of work done by an average worker. Taylor introduced Time and Motion Studies to fix performance standards. He fixed performance standards for time, cost, and quality of work, which lead to uniformity of work. As a result, the efficiency of the workers could be compared with each other Watson (2012). The principle of performance standard will therefore to be applied in investigating the influence of training on E-Procurement optimization in government parastatals in Kenya.

Theory of Transaction Cost Economics

The theory will guide the study in investigating the relationship between supplier/buyer integration E-Procurement optimization in government parastatals in Kenya. The theory of transaction cost economics was driven by the objective of profit maximization. The basic assumption underlying the theory suggests that relationships between buyers and suppliers lower transaction costs and facilitate investment in relation-specific asset (Williamson, 1981, 1985). It is found that opportunism will not be a concern over highly specific assets if there is mutual beneficial relationship between the buyer and suppliers (Irwin *et al*, 2010).The transaction cost theory underpins supplier/buyer variable in the present study. In an effort to minimize costs associated with potential delays and inadequate E-procurement arrangements, a public organization will be keen to settle for suppliers / buyers that have all its E-procurement well factored to avoid any unplanned expenditure or losses.

Compliance Theory

The theory will guide the study in investigating the relationship between legal framework on E-Procurement optimization in government parastatals in Kenya. According to Kal Raustialla (2010), compliance theory is an approach to organizational structure that integrates several ideas from the classical and participatory management models. According to compliance theory, organizations can be classified by the type of power they use to direct the behavior of their members and the type of involvement of the participants. In most organizations, types of power and involvement are related in three predictable combinations: coercive-alienative, utilitarian-calculative, and normative-moral. Of course, a few organizations combine two or even all three types.

The specific objective: To assess the effect of legal framework on optimization in government parastatals will be well related to compliance theory. The Kenyan Government has moved to implement the laws that will aid sustainable public procurement.

Conceptual Framework

The conceptual framework explains the relationship between the independent variables and the dependent variables. The former is presumed to be the cause of the changes while the former affects the latter (Kothari, 2004). In this study, the conceptual framework is based on variables that have been critically derived from the specific objectives and will define the relationship between ICT, training, buyer supplier integration and legal framework that are interrelated. The conceptual framework will guide the study in investigating the relationship between supplier/buyer integration E-Procurement optimization in government parastatals in Kenya.

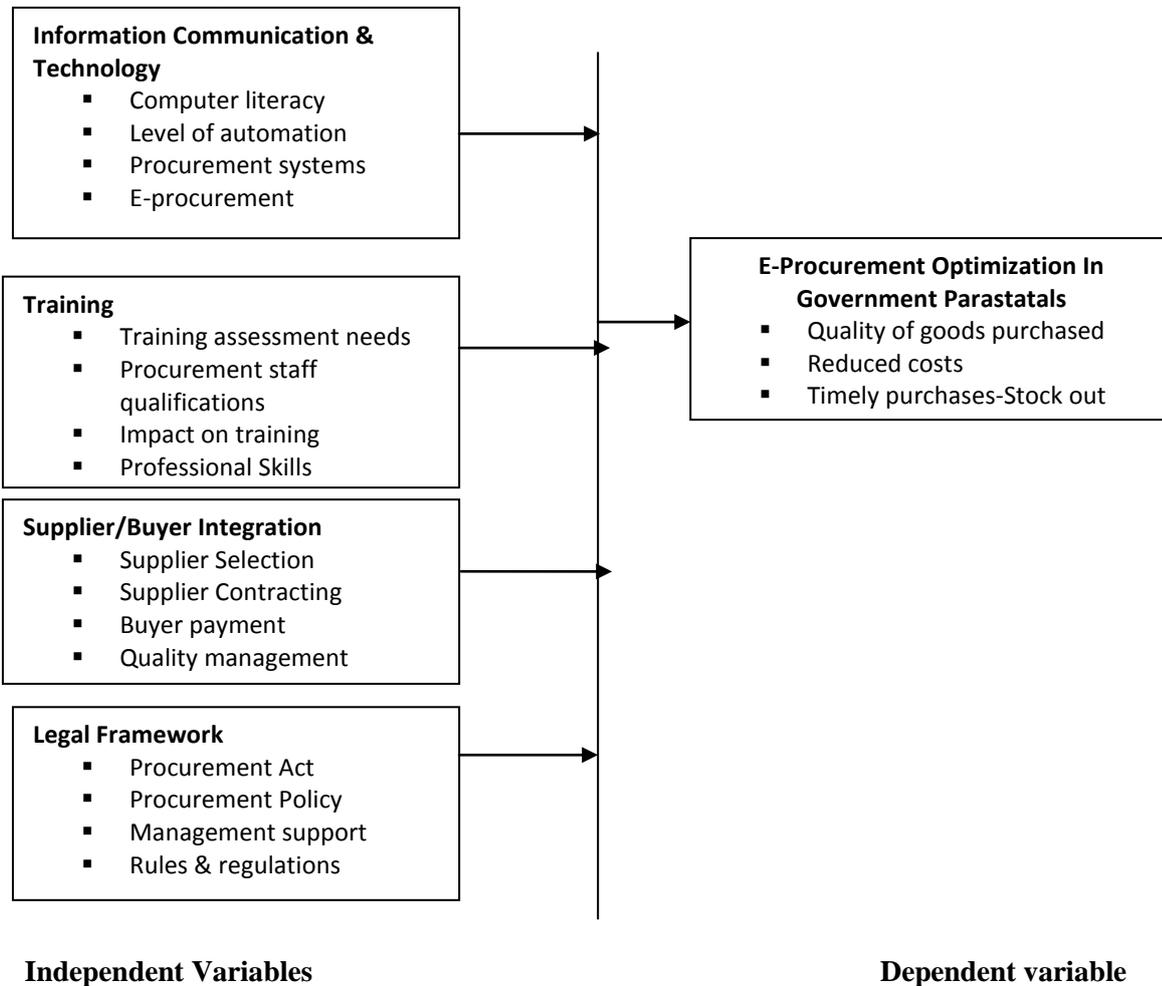


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

Research Design

The research design employed was descriptive survey where data was collected one point in time. Mugenda (2008) notes that a descriptive survey seeks to obtain information that describes existing phenomena by asking questions relating to individual perceptions and attitudes. The design is considered suitable as it allows an in-depth study of the problem under investigation.

3.3 Target Population

Mugenda and Mugenda (2012), describes a population as the entire group of individuals or items under considerations in any field of inquiry and have a common attribute. Target population is defined by Garg and Kothari (2012) as a universal set of the study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result. In this study the target populations was 85 staff of Kenya Power Ltd drawn from supply chain and related departments who were engaged in procurement activities as tabulated below.

Table 1. Target Population

Category	Population	Percentage (%)
Human resource & Administration,	25	20.41
Finance & control	13	15.30
Legal	15	17.65
Audit	32	37.65
Total	85	100%

Source: Kenya Power Ltd (2016)

Sample Size and Sampling Technique

The actual population in this study was made up of the 85 employees of Kenya Power Ltd. Since the population was relatively small, a census survey will be used implying that all the targeted respondents was studied. Census provides a true measure of the population since there is no sampling error and more detailed information about the study problem within the population is likely to be gathered (Saunders, 2011).

Data Collection Instrument

This study used structured questionnaires to obtain information from study respondents. The study made use of primary data by administration of structured questionnaires. Structured questionnaires will consist of both open ended and closed ended questions designed to elicit specific responses for qualitative and quantitative analysis respectively.

Data Collection Procedure

The researcher contacted the management with an introduction letter requesting for permission to collect data and to drop questionnaires. The individual employees were explained for by the researcher on the intention and purpose of the study. The researcher then recruited and trained two research assistants in an effort to ensure that they carried out the exercise properly. The questionnaires were then delivered by the researcher with the help of the two research assistants to the respondents. The respondents filled the questionnaires within a period of two weeks after which the questionnaires were collected. The study targeted a total population of 85 respondents from which 60 filled in and returned the questionnaires making a response rate of 70.58%

Pilot Study

Piloting of the questionnaire was done prior the actual data collection by using it on the employees of Kenya Power Ltd which will not be included in the final study. The research instrument will be pre-tested as per Mugenda and Mugenda (2012) which says that a successful pilot study will use 1% to 10% of the actual population. The suitability of the questionnaire for this study was tested by first administering it to 8 employees of the Kenya Power Ltd which is approximately 10%. The respondents were asked to evaluate the clarity, relevance and usefulness of the questionnaires. Piloting will enable the researcher to ascertain the validity and reliability of the instrument. After pilot testing, the questionnaire were revised to incorporate the feedback that was provided.

Validity of Research Instrument

The study adopted content validity which indicates whether the test items represent the content that the test is designed to measure. The validity of the instrument may assist in determining accuracy, clarity and suitability of the instruments. It may also help to identify inadequate and ambiguous items such that those that fail to measure the variables they are modified or disregarded completely and new items

added. Gall et al, (2006) points out that content experts help determine content validity. The draft questionnaire was given to a selected person knowledgeable in research to ascertain the items suitability in obtaining information according to research objectives of the study. The content validity formula by Amin (2005) was used in this study. The formula is; Content Validity Index = (No. of judges declaring item valid) / (Total no. of items). It is recommended that instruments used in research should have CVI of about 0.78 or higher and three or more experts could be considered evidence of good content validity (Amin, 2005). This study adopted a threshold of 0.78. All the CVI values of the four study variables exceeded the threshold as indicated: ICT(.889), Training(.989), Supplier/Buyer Integration (.878), Legal framework (.798) and E-Procurement Optimization (.900).

Reliability of Research Instrument

Reliability of the instruments concerns the degree to which a particular instrument gives similar results over a number of repeated trials (Mugenda & Mugenda, 2012).

The research instrument was deemed reliable if the reliability coefficient is about 0.7 and above Mugenda and Mugenda (2012). The study will use the most common internal consistency measure known as Cronbach's alpha (α). It indicates the extent to which a set of test items can be treated as measuring a single latent variable the recommended value of 0.7 was used as a cut-off of reliabilities. The reliability coefficients for each of the variables studied are as follows: ICT(.850), Training(.885), Supplier/Buyer Integration (.795), Legal framework (.798) and E-Procurement Optimization (.911).

Data Analysis and Presentation

Data was analyzed using statistical package for social science (SPSS) version 22 and Excel. The findings will be presented using tables, charts and graphs to facilitate comparison and for easy inference Content analysis was employed to analyze the qualitative data whereas statistical methods such as descriptive statistics and regression analysis was utilized to analyze the quantitative data. In order to analyze the relationship between the independent variables and the dependent variable the study may use multiple regression analysis at 5% level of significance. To test the level of significance of each independent variable against dependent variable the study may use the model summary ANOVA and Coefficient Regression.

The Multiple Regression model that aided the analysis of the variable relationships was as follows: $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$, Where, Y_i = E-Procurement Optimization; β_0 = constant (coefficient of intercept), X_1 = Information Communication & Technology; X_2 = Training; X_3 = Buyer/supplier integration; X_4 = Legal Framework; ϵ = error term; $\beta_1 \dots \beta_4$ = regression coefficient of four variables.

RESULTS AND DISCUSSIONS

Demographic Information

Gender of Respondents

The study sought to establish the gender distribution of the respondents and the findings are presented in Table 2. From the results, both male and female respondents participated in the study and results show that 50.00% were male, 37.14% were female and 12.86% of the respondents did not indicate their gender. The results indicate that the two genders were adequately represented in the study since there is none which was more than the two-thirds. However, the statistics show that the male gender could be dominating the procurement department in the organization.

Table 2: Gender of Respondents

Gender	Frequency	Percentage
Male	30	50.00%
Female	22	37.14%
Did not Respond	8	12.86%
Total	60	100

Age of the Respondents

In order to establish the ages of the respondents who participated in this study were recorded as shown in Figure 2. A total of 35 respondents answered this question and the findings show that 53.85% of the respondents were aged between 18 to 35 years, 32.76% were more than 35 years old while 13.39% did not indicate their age. The findings are in agreement with those of Price & Banham (2011) who established that there are two natural age peaks of the late 20s and mid 40s which are correlated to E-optimization in the government parastatals. The two peaks fall in both the two age brackets used in this study. Again, this shows that those who were interviewed were adults who are capable of making independent judgments and the results of a research process involving them is deemed to be valid.

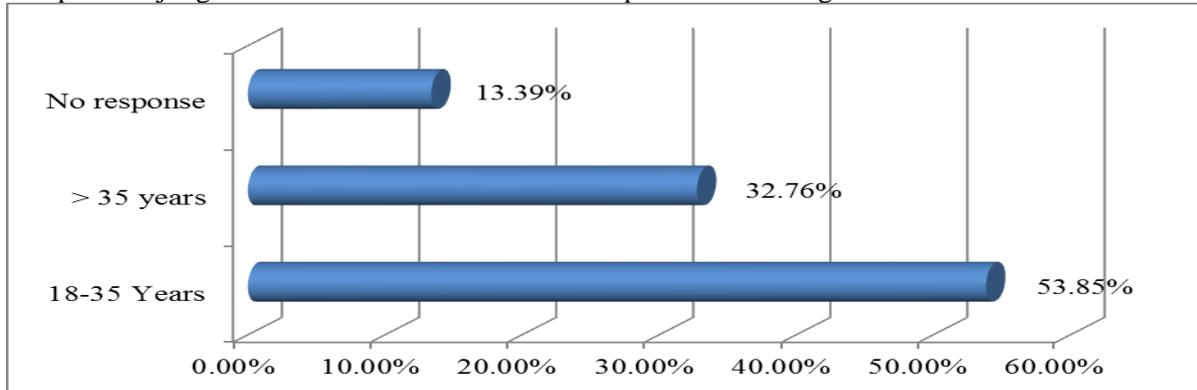


Figure 2: Age of the Respondents

Respondents Level of Education

The respondents were kindly requested to state their level of education and from the study findings as shown in Table 3, 16% had diploma, 32% had bachelors and 29% had reached secondary school certificates, 10% cited to have acquired primary level of education and 15% had no formal education but hands on skills. This infers that most of the respondents had formal education and could understand the problem under study.

Table 3: Level of Education

Years	Frequency	Percentage
Post graduate degree	17	23%
Bachelors	9	32%
Diploma	15	16%
Certificate	14	19%
Hands on training	4	15%
Total	60	100

Study Variables

The study set out to examine the drivers of E-procurement optimization in government parastatals in Kenya. To this end, four variables were conceptualized as drivers of affecting E-procurement optimization thereof. These include: ICT, Training, Supplier/buyer integration and legal framework.

Information Communication and Technology

This section presents findings to survey questions asked with a view to establish the influence of information communication and technology on E-Procurement optimization in government parastatals in Kenya. Responses were given on a five-point likert scale (where 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1= Strongly Disagree). The scores of ‘strongly disagree’ and ‘disagree’ have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of ‘Neutral’ has been taken to represent a statement agreed upon moderately, equivalent to a mean score of 2.6 to 3.4. The score of ‘agree’ and ‘strongly agree’ have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.4. Table 4.4 presents the findings.

As indicated by high levels of agreement in table 4, a majority of respondents affirm that the procurement staff is computer literate to comply with the rules and regulations (4.013); Level of automation is adequate thus increase customer satisfaction (3.953); The level of procurement systems usage is adequate thus procured quality goods (3.701); The level of automation has led to compliance with rules and regulations (3.713). However a majority moderately agrees that the firm’s level of

embracement of E-procurement has enhanced customer satisfaction (3.452); The procurement staff is computer literate thus reduction of procurement costs (3.357). As such, it can be concluded that overall, ICT is adequately observed in the study area's procurement process. Most notably, use of IT in the Procurement process, funding, timely delivery of goods and services as well as qualified manpower and training. Possible setbacks may however have been experienced in the use of ICT as per the moderate agreement levels. From the foregoing, it can be deduced that ICT is among the key drivers of E-Optimization in government parastatals in Kenya.

This is in tandem with Bedey (2012) who asserts that overall, enterprises employing organized procedures, resources and ICT systems to consistently employ and align all procurement strategies in a consistent and integrated method outperformed peers in cost savings, expenditure under management, compliance, supplier integration, and greater contribution to enterprise value. Simms (2008) adds that most of the public entities lack clear accountability on how the resources provided impact on their performance therefore going against the fundamental principles of public procurement due to lack of adoption of information communication and technology.

Table 4: Information Communication and Technology

Information Communication and Technology	Mean	Std
The procurement staff is computer literate to comply with the rules and regulations	4.013	0.5423
Level of automation is adequate thus increase customer satisfaction	3.713	1.0617
The level of procurement systems usage is adequate thus procured quality goods	3.357	0.6834
The level of automation has led to compliance with rules and regulations	3.701	0.9431
The firm's level of embracement of E-procurement has enhanced customer satisfaction	3.452	1.2317
The procurement staff is computer literate thus reduction of procurement costs	3.276	0.8612

Training

This section presents findings to survey questions asked with a view to establish the influence of training on E-Procurement optimization in government parastatals in Kenya. Responses were given on a five-point likert scale (where 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1= Strongly Disagree). The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'Neutral' has been taken to represent a statement agreed upon moderately, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.4. Table 6 presents the findings.

Table 6: Training

Training	Mean	Std. Dev
There is sufficient and qualified procurement personnel with enough training assessment methods to enhance compliance with the rules and regulations	4.224	0.5682
There is adequate training and simulation for key stakeholders especially on the procurement staff qualifications to promote reduction of procurement costs	3.891	0.6134
Organization offers professional skills related to procurement to enhance customer satisfaction	4.109	1.0067
The impact of training as enhanced by the organization has been established in compliance with the rules and regulations	4.052	0.5225
Training assessment needs as requirement by the organization enhances compliance with rules and regulations	3.643	.5360
Procurement staff qualifications are adequate thus improved procured quality goods	3.815	.5137
Professional skills are necessary for the supply chain officers to reduce the procurement costs in the organization	3.713	.4976

A majority of respondents were found to highly agree that there is sufficient and qualified procurement personnel with enough training assessment methods to enhance compliance with the rules and regulations (4.224); There is adequate training and simulation for key stakeholders especially on the procurement staff qualifications to promote reduction of procurement costs (4.109); Organization offers professional skills related to procurement to enhance customer satisfaction (4.052); The impact of training as enhanced by the organization has been established in compliance with the rules and regulations (3.891); Training assessment needs as requirement by the organization enhances compliance with rules and regulations (3.815); Training assessment needs as requirement by the organization enhances compliance with rules and regulations (3.772); Procurement staff qualifications are adequate thus improved procured quality goods (3.713); Professional skills are necessary for the supply chain officers to reduce the procurement costs in the organization (3.643).

This is in agreement with Rotich (2011) who offers that other issues affecting E-procurement have to do with core objectives being set by training modules on the application of the technology Mahmood (2010) also argues that in view of the setbacks presented to the public by the procurement systems, it should be realized that procurement practitioners face many challenges given by complexity of trainings, and government systems at times not in line with the procurement act. Thai and Grimm (2009) however observe that regardless of the effort by the governments of developing countries, like Kenya and development policies like the procurement Acts and regulations enacted to improve resource performance of the procurement function, public procurement is still marred by poor training of the staff on the modern technologies.

Supplier/Buyer Integration

This section presents findings to survey questions asked with a view to establish the influence of supplier/Buyer on E-Procurement optimization in government parastatals in Kenya. Responses were given on a five-point likert scale (where 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree). The scores of 'strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'Neutral' has been taken to represent a statement agreed upon moderately, equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.4. Table 7 presents the findings.

As tabulated, a majority of respondents were found to highly agree that they do appraise the suppliers annually (3.993); they ensure the suppliers are paid in time (3.923); they do get after sale service from your suppliers annually (3.857); The suppliers do fail to honor the orders issued (3.714); the suppliers offer credit facilities (3.572). A majority however only moderately agrees that the suppliers offer credit facilities. (3.391); Resolve immediate problems that would disrupt the work (3.325); recognize contributions and accomplishments of the suppliers (3.239); and that consult with suppliers on challenges affecting them (3.042) Keep suppliers informed about management actions affecting them(3.876). Respondents were further asked to cite other factors on supplier/buyer integration affecting E-procurement optimization in the organization. A majority cited cost effectiveness and efficiency, in which case supplier/buyer integration reduces wastages in resources including time and finances. The foregoing findings depict moderate to high levels of supplier/buyer integration in the organization.

This finding supports Ambe (2012) who argues that conducting supplier/buyer integration early in the procurement process is a useful technique to identify the likely key issues in relation to the planned procurement. Consider the internal and external stakeholders who may need to be involved in the procurement planning. Rotich (2011) holds that the main factors influencing the level of detail in a significant E-procurement plan relate to the size, scope and risk of the procurement and uncertainty about its requirements, together with the complexity of the supplier/buyer integration to achieve a successful outcome. Bedey (2008) adds that in determining the level of detail required for specific significant procurement plans, agencies must take into consideration the nature of their procurement environment and the capability of their procurement function as enhanced by the supplier/ buyer integration.

Table 7: Supplier/Buyer Integration

Supplier/Buyer Integration	Mean	Std. Dev
We do appraise the suppliers annually.	3.239	0.8317
We ensure the suppliers are paid in time	3.993	0.6315
We do get after sale service from your suppliers annually	3.325	1.0092
The suppliers do fail to honor the orders issued	3.857	1.3718
Our suppliers offer credit facilities..	3.042	0.6347
Resolve immediate problems that would disrupt the work.	3.391	0.5645
Recognize contributions and accomplishments of the suppliers.	3.572	0.4762
Consult with suppliers on challenges affecting them.		
Keep suppliers informed about management actions affecting them	3.714	0.5765

Legal Framework

Lastly, the study further sought to analyze the influence of legal framework on E-Procurement optimization in government parastatals in Kenya. Responses were given on a five-point likert scale (where 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1= Strongly Disagree). The scores of ‘strongly disagree’ and ‘disagree’ have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of ‘Neutral’ has been taken to represent a statement agreed upon moderately, equivalent to a mean score of 2.6 to 3.4. The score of ‘agree’ and ‘strongly agree’ have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.4. Table 8 presents the findings.

Table 8: Legal Framework

Legal Framework	Mean	Std. Dev
Organization has enforced the procurement process to enhance compliance with rules and regulations on the public procurement	3.583	0.9442
Organization has enforced the procurement planning guidelines to enhance procurement of quality goods	3.619	0.0429
All procurement in the organization is guided by the management support to increase customer satisfaction	3.629	0.8592
Procurement methods used provide guidance to the procurement process to enhance compliance with the rules and regulations	3.603	0.3056
Staff in Supply Chain are members understand the procurement process to reduce procurement costs	3.601	1.3078
Organization has an annual Disposal plan as detailed in the procurement planning to ensure there is procured quality goods	3.842	0.9745
Organization uses standard tender documents which enhance the procurement process to increase customer satisfaction	3.374	0.6734
All goods are inspected before acceptance as procurement methods are duly followed to ensure procured quality goods.,	3.928	1.0080

A majority of respondents highly agrees that Organization has enforced the procurement process to enhance compliance with rules and regulations on the public procurement (3.928); Organization has enforced the procurement planning guidelines to enhance procurement of quality goods (3.842); All procurement in the organization is guided by the management support to increase customer satisfaction (3.629); Procurement methods used provide guidance to the procurement process to enhance compliance with the rules and regulations (3.619); Staff in Supply Chain are members understand the procurement process to reduce procurement costs (3.603); Organization has an annual Disposal plan as detailed in the procurement planning to ensure there is procured quality goods (3.601); Organization uses standard tender documents which enhance the procurement process to increase customer satisfaction (3.583); All goods are inspected before acceptance as procurement methods are duly followed to ensure procured quality goods (3.524). Respondents were further asked to briefly provide any other aspect which may enhance legal framework on E-procurement performance in the Public sector. A majority in this regard cited risk management, insurance as well as resource efficiency. The foregoing findings reveal that legal framework is a key consideration in the study area’s E-procurement process. The legal framework practice thereof is comprehensive with

emphasis laid on among other attributes, awarding, insurance and risk management policies requirements review in the procurement process as well as awarding of contracts on a competitive basis.

This is in line with Kakwezi and Nyeko (2010) who emphasize the need to make appropriate mid to longer-term policies in procurement process capabilities. As KLR (2015) provides, these rules and regulations should be used to improve strategies, policies, practices, as well as the organizational tools and technological upgrades needed to achieve the targeted level of E-Optimization in the procurement management process and control.

E-Optimization in Government Parastatals

The study sought to determine E-procurement Optimization with reference to Kenya Power Company, attributed to the influence of information communication and technology, training, supplier/buyer integration and legal framework. The study was particularly interested in three key indicators, namely Quality of goods purchased, Cost reduction and Timely Purchases-stock out reduction, with all the three studied over a 5 year period, running from 2012 to 2016. Table 9 below presents the findings.

Findings in Table 9 above reveal improved financial performance across the 5 year period running from the year 2012 to 2016. Quality of goods purchased recorded positive growth with a majority affirming to less than 10% in 2012 (42.3%) and 2013 (37.7%), to 10% in 2014 (36.1%) then more than 10% in 2015 (41.1%) and 2016 (37.5%). A similar trend was recorded in Cost reduction, growing from less than 10% (44.1%) in 2012, to more than 10% in 2013 (36.4%), 2014 (40.4%) and 2016 (37.3%). Timely Purchases-stock out reduction further recorded positive growth with a majority affirming to less than 10% in 2012 (37.9%) and 2013 (35.9%), to 10% in 2014 (35.9%) and 2016 (35.3%) then by more than 10% in 2016 (36.2%). It can be deduced from the findings that key E-procurement optimization indicators have considerably improved as influenced by among other procurement management attributes, the influence of ICT, training, supplier/buyer integration and legal framework. The Quality of goods purchased and Timely Purchases-stock out reduction have particularly improved by at least 10 percent across the organization pointing to the significance of ICT, training, supplier/buyer integration and legal framework in the E-procurement optimization process.

Table 9: E-Optimization in Government Parastatals

Quality of goods purchased	2012	2013	2014	2015	2016
Increased by less than 10%	42.3	37.7	31.6	30.7	29.5
Increased by 10%	31.8	32.9	36.1	28.2	33
Increased by more than 10%	25.9	29.4	32.3	41.1	37.5
Cost reduction	2011	2012	2013	2014	2015
Increased by less than 10%	44.1	35.2	33.4	25.7	27.1
Increased by 10%	31.7	32.6	30.2	33.9	35.6
Increased by more than 10%	23.5	32.2	36.4	40.4	37.3
Timely Purchases-stock out reduction	2011	2012	2013	2014	2015
Increased by less than 10%	37.9	35.9	31.2	25.7	33.1
Increased by 10%	36.2	31.3	35.9	35.3	30.7
Increased by more than 10%	25.9	32.8	32.9	39	36.2

Multiple Regression Analysis

In addition, the researcher conducted a multiple regression analysis so as to test relationship among variables (independent) on the E-procurement optimization in government parastatals. The study applied the statistical package for social sciences (SPSS V. 22) to code, enter and compute the measurements of the multiple regressions for the study. According to the model summary Table 10, R is the correlation coefficient which shows the relationship between the independent variables and dependent variable. It is notable that there exists a strong positive relationship between the independent variables and dependent variable as shown by R value (0.867). The coefficient of determination (R²) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable and the four independent variables that were studied explain 76.90% of the E-procurement optimization in government parastatals as represented by the R². This therefore means that other factors not studied in this research contribute 23.10% to the E-procurement optimization in government parastatals. This implies that these variables are very significant therefore need to be considered in any effort to boost

E-procurement optimization in government parastatals in Kenya. The study therefore identifies variables as critical drivers of E-procurement optimization in government parastatals in Kenya.

Table 10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877	.769	.725	.003

Further, the study revealed that the significance value is 0.001 which is less than 0.05 thus the model is statistically significant in predicting how ICT, training, supplier/buyer integration and legal framework affect E-procurement optimization in government parastatals in Kenya. The F critical at 5% level of significance was 11.543. Since F calculated (21.397) is greater than the F critical (value = 11.543), this shows that the overall model was significant.

Table 11: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	52.543	4	13.1358	21.397	.001 ^a
	Residual	33.765	55	.6139		
	Total	86.308	59			

NB: F-critical Value = 11.543;

The study ran the procedure of obtaining the regression coefficients, and the results were as shown on the Table 11. Multiple regression analysis was conducted as to determine the relationship between E-Procurement optimization in government parastatals and the four variables. According to the regression equation established, taking all factors into account (Information communication and technology, training, supplier/buyer integration and legal framework) constant at zero E-Procurement optimization in government parastatals was 13.876.

The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in information communication and technology will lead to a 0.809 increase in E-Procurement optimization in government parastatals.; a unit increase in training will lead to a 0.765 increase in E-Procurement optimization in government parastatals, a unit increase in supplier/buyer integration will lead to 0.678 increase in E-Procurement optimization in government parastatals and a unit increase in legal framework will lead to 0.623 increase in E-Procurement optimization in government parastatals. This infers that access to information communication and technology contributed most to E-Procurement optimization in government parastatals.

At 5% level of significance, information communication and technology had a 0.000 level of significance; training show a 0.001 level of significance, supplier/buyer integration show a 0.003 level of significance and legal framework show a 0.004 level of significance hence the most significant factor was information communication and technology.

Table 11: Regression Coefficient Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	P-value.
		β	Std. Error	β		
1	(Constant)	13.876	.023		2.615	.007
	ICT	.809	.093	.667	7.098	.000
	Training	.765	.150	.601	6.087	.001
	Supplier/Buyer Integration	.678	.240	.556	5.008	.003
	Legal Framework	.623	.283	.511	4.546	.004

As per the SPSS generated table above, the model equation would be ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$) becomes: $Y = 13.876 + 0.809X_1 + 0.765X_2 + 0.678X_3 + 0.623X_4$. This indicates that E-Procurement optimization in government parastatals = 13.876 + 0.809(ICT) + 0.765(Training) + 0.678(Supplier/Buyer Integration) + 0.623 (Legal framework) + 0.023

CONCLUSION

Based on the study findings, the study concludes that E-Procurement optimization in government parastatals in Kenya is affected by information communication and technology, training, supplier/buyer integration and legal framework are the major drivers that mostly affect E-Procurement optimization in government parastatals in Kenya.

The study concludes that information communication and technology is the first important factor that E-Procurement optimization in government parastatals in Kenya. The regression coefficients of the study show that information communication and technology has a positive significant influence on E-Procurement optimization in government parastatals in Kenya. This implies that increasing levels of information communication and technology would increase the levels of E-Procurement optimization in government parastatals in Kenya. This shows that information communication and technology has a positive influence on E-Procurement optimization in government parastatals in Kenya.

The study concludes that training is the second important factor that influences E-Procurement optimization in government parastatals in Kenya. The regression coefficients of the study show that training has a significant influence on E-Procurement optimization in government parastatals in Kenya. This implies that increasing levels of training would increase the levels of E-Procurement optimization in government parastatals in Kenya. This shows that training has a positive influence on E-Procurement optimization in government parastatals in Kenya.

Further, the study concludes that supplier/buyer is the third most important factor that influences E-Procurement optimization in government parastatals in Kenya. The regression coefficients of the study show that training has a significant influence on E-Procurement optimization in government parastatals in Kenya. This implies that increasing levels of supplier/buyer would increase the levels of E-Procurement optimization in government parastatals in Kenya. This shows that supplier/buyer has a positive influence on E-Procurement optimization in government parastatals in Kenya.

Finally, the study concludes that legal framework is the fourth most important factor that influences E-Procurement optimization in government parastatals in Kenya. The regression coefficients of the study show that legal framework has a significant influence on E-Procurement optimization in government parastatals in Kenya. This implies that increasing levels of legal framework would increase the levels of E-Procurement optimization in government parastatals in Kenya. This shows that legal framework has a positive influence on E-Procurement optimization in government parastatals in Kenya.

RECOMMENDATIONS

The study explored the drivers of E-Procurement optimization in government parastatals in Kenya with specific reference to Kenya Power Company. Based on the findings, the following recommendations were made which the organization, other parastatals and even the private organizations should put in place to address these issues if Kenya is to achieve its vision 2030 plans on the public procurement.

To enhance E-procurement optimization in the government parastatals, there is need to ensure that the procurement staff is computer literate to comply with the rules and regulations.

There should be adequate training and simulation for key stakeholders especially the procurement staff qualifications to promote reduction of procurement costs.

To enhance E-procurement optimization in the government parastatals, there is need to foster the element of buyer/supplier integration. There is need to do appraise the suppliers annually.

There is need for the government to develop and enforce policies which can enhance E-procurement optimization in the parastatals. The procurement planning guidelines to enhance procurement of quality goods should be duly followed.

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