

## **INFLUENCE OF ELECTRONIC ORDER PROCESSING ON SUPPLY CHAIN PERFORMANCE OF SUGAR PROCESSING FIRMS IN KENYA**

**<sup>1\*</sup> Evans Biraori Oteki**

*PhD Supply Chain Management Student, Jomo Kenyatta University of Agriculture and Technology  
evansoteki@yahoo.com*

**<sup>2\*\*</sup> Professor Gregory S. Namusonge (Ph. D)**

*Senior Lecturer, Jomo Kenyatta University of Agriculture and Technology  
gsnamusonge@jkuat.ac.ke*

**<sup>3\*\*\*</sup> Professor Maurice Sakwa (Ph. D)**

*Senior Lecturer, Jomo Kenyatta University of Agriculture and Technology  
msakwa@jkuat.ac.ke*

**<sup>4\*\*\*\*</sup> Dr. John Ngeno (Ph. D)**

*Kenya Bureau Standards  
jngeno@gmail.com*

### **Abstract**

---

*The aim of this study was to establish the influence of electronic procurement practices on supply chain performance of sugar processing firms in Kenya guided by specific objective, to establish the influence of electronic order processing practice on supply chain performance. Mixed research design was applied and the target population comprised of 12 sugar processing firms in Kenya with a target population of 7,584. Stratified random sampling was applied to come up with a sample size of 367. Data was gathered by a self-administered drop and pick questionnaire, interviews and observation. The results reveal that there is significant relationship between electronic order processing practice and supply chain performance. The study concludes that electronic order processing practice enhances supply chain performance. The study recommends that Sugar firms in Kenya need to incorporate all the electronic order processing practices into the system to enable improve their supply chain performance.*

**Keywords:** Procurement Compliance, Competitive Bidding, Supplier Evaluation, Nairobi City County

### **I. INTRODUCTION**

E-Procurement is an important business avenue for lowering purchasing price and enhancing process efficiency. The e-procurement value chain consists of indent management, e-Informing, e-Tendering, e-Auctioning, vendor management, catalogue management, Purchase Order Integration, Order Status, Ship Notice, e-invoicing, e-payment, and contract management. Effective supply chains are crucial for a firm to remain competitive in today's

competitive economic environment. This effectiveness is driven by striving for proper synchronization and coordination of all activities across the entire supply chain network, ranging from end-customers to suppliers. As a result, once relegated functions such as procurement, a primary determinant for the organization's relationship with suppliers become important. Major changes are currently taking place within purchasing functions

of manufacturing firms, (Chartered Institute of Purchasing and Supplies, 2011).

A good e-procurement system must have all elements that enable the buyers and sellers interact effectively including all supply chain activities from procurement planning information to supplier evaluation. Both buyers and sellers should have access to each other's information as and when required electronically for smooth functioning of E-procurement. The commonly adopted e-procurement practices used in the public procurement includes: E-Tendering, E-Request for Quotations, E-Auctions, E-Catalogues, and E-Invoicing (Vaidya, Sajeev and Callender, 2006). According to Roma and Mc Cue (2012), tools such as E-Notice, E-Auction, E-Catalogue, E-Dossier, E-Submission and E-Signatures are part and parcel of e-procurement. In this study, Enterprise Resource planning (ERP); an information system package that integrates information and processes across organizational functions (Brazel and Dang, 2008), E-maintenance; maintenance managed through computer over the internet (Levrat and Lund, 2003), E-tendering, tendering through online platforms (Garran, 2005) and E-Sourcing (online sourcing).

Enterprise Resource Planning (ERP) followed in the 1970s, and then came the commercial use of the Internet in 1980s. It was only in the 1990s that the World Wide Web - the multimedia capability of the Internet became widely enabled and provided the essential resource for the automation of procurement (OGC, 2002). According to Koorn, Smith and Mueller (2001) there are three types of e-Procurement Systems: Buyer e-Procurement Systems, Seller e-Procurement Systems and Online Intermediaries. While various e-Marketplaces have been launched based on the Enterprise Portal philosophy, the implementation of e-Procurement systems usually consists of two technologies within the Enterprise Application philosophy: a workflow system integrated with an e-Procurement application that supports requisition to payment;

and the electronic catalogue that lists suppliers' items and prices over the Internet. Within these two philosophies, there are again two different approaches that the public sector agencies have used for implementation of e-Procurement: an end-to-end e-Procurement solution (the "big bang" approach), and the incremental implementation (Pan and Parkes, 2006).

In Kenya, manual systems have been a source of major inefficiencies in the regulation and operations of the procurement function. Therefore, there is need to adopt ICT in order to ensure proper functioning of the procurement system. To meet today's operating challenges, organizations are turning to ICT to improve the services for suppliers and other customers in order to lower operating costs and improving performance. Online communication, online tender advertising and computerized tendering process influences performance of the procurement function. IT offers smoother and faster process flow, efficient distribution of information, decentralization of tasks and decisions, increased transparency and better control (Mburu and Njeru, 2014).

In Kenya, there are some organizations that have successfully embraced the use of e-procurement technology. For instance Nation Media group through their digital platform commonly known as N-Soko enables their clients to purchase products online (Gitahi, 2011). Awino (2011) conducted an investigation of selected strategy variables on firm's performance. The study focused on supply chain management in large private manufacturing firms in Kenya. It was established that most of the SCM strategies of large manufacturing firms in Kenya are not owned by individual firms but also other organizations within the SC that provide the required linkages towards the overall corporate performance of the manufacturing industry.

### **Statement of the problem**

Sugar production in Kenya reduced from 580 metric tons in 2015/2016 to 520 metric tons in 2016/2017 (Global Agricultural Information Network, 2017). The high cost of production per ton of sugar and the reduction in sugar output can be associated to the application of manual procurement systems by sugar processing firms in Kenya. Because of lack of efficiency and effectiveness of procurement process, the government of Kenya continues to lose millions of shillings through fraud in procurement activities in the government mainstream (GAIN, 2017).

Waniani, Namusonge and M. Lagat (2016) found out that technological infrastructure available in Nzoia Sugar Company was considered to be adequate. A large portion (66.9%) of the respondents agreed that the company has adequate technological infrastructure to support e-procurement. This included hardware and software, the internet and technical expertise. 33.1% of the respondents disagreed that the technological infrastructure was not adequate to support e-procurement. They attributed this to unreliable internet and lack of scanners. The respondents agreed that Internet connection; poor network coverage and system failures are the challenges facing the Nzoia Sugar Company in e-procurement implementation and company have acquired the required ICT infrastructure to support e-procurement in advance. They disagreed on internal electronic communication on issues related to procurement using technologies other than email such as instant messaging; video conferencing and they strongly disagreed on permitting the suppliers to directly access the internal systems such as Enterprise Resource Planning Systems and Technological integration of the e-procurement system with other internal systems. The respondents considered the security of data and information as the most important element in procurement. Technological infrastructure accounted for 11.38% of e-procurement implementation in Nzoia Sugar Company.

To understand the concept of e-procurement and the associated benefits, a number of studies have been done. For instance, studies have been done on implementation of e-procurement, challenges of implementation of e-procurement and benefits of e-procurement. Studies have also related e-procurement with other variables like operational and overall organizational performance. Studies carried out in Kenya focused on other areas of procurement and logistics. Muhia & Afande (2015) studied the role of adoption of e-procurement strategy on procurement performance of state corporations in Kenya by focusing on Kenya Revenue Authority. Kioko and Mwangangi (2017) studied the influence of e-procurement on performance of parastatals in Kenya. Fozia, Namusonge and Shaelle (2016) studied the effect of electronic supplier management practices on the implementation of preference regulations on state corporations in Kenya. Nafula and Namusonge (2017) studied the effect of e-procurement practices on efficiency frontier of Kakamega County Government. Barasa, Namusonge and Okwaro (2017) studied the effects of E-procurement on the organizational Performance of County Governments in Kenya: A Case study of Bungoma County Government. A few studies have related e-procurement with Supply chain performance while none had studied such relationship in the sugar manufacturing sector. The study is driven by the fact that the history of the Kenya sugar industry has been revolving around procurement, production and distribution inefficiencies, inability to compete with imported sugar and perennial losses. It is however not clear that the past studies on e-Procurement have focused on the influence of e-Procurement on Supply Chain performance particularly in sugar processing firms. The aim of this study is there to fill this knowledge gap by finding out the influence of electronic tendering, effect of electronic order processing practice, electronic material management and electronic supplier management practice, with an aim to recommend how E-procurement can improve

procurement of goods and services in the manufacturing sector.

**General objective**

The general objective of the study was to establish the influence of E-procurement practices on supply chain performance of sugar processing firms in Kenya

**Specific objective**

To evaluate the influence of electronic order processing practice on supply chain performance of sugar processing firms in Kenya.

**Research Questions**

What is the significance order processing practice on supply chain performance of sugar processing firms in Kenya?

**Research hypotheses**

*H<sub>01</sub>*: Electronic order processing practice has no significant influence on supply chain performance of sugar processing firms in Kenya.

**II. LITERATURE REVIEW**

**Conceptual framework**

The dependent variable is supply chain performance and independent variable is electronic order processing as shown in figure 1 below;

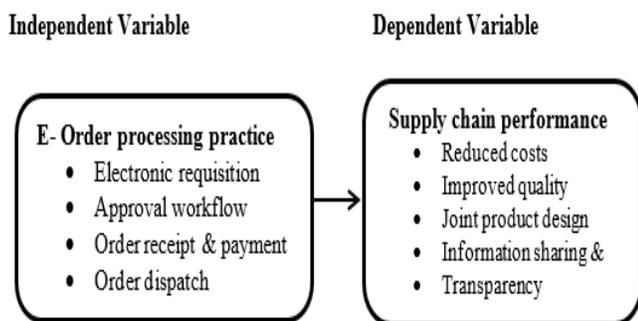


Figure 1: Conceptual Framework

**Review of Variables**

**Electronic order processing practice**

Order processing is a crucial element of order fulfillment and first stage of the fulfillment cycle. Order processing, using range of clear procedures, represent the basis of all logistics systems which makes it a key factor in logistics operations. Order processing starts with the receipt of or purchase requisition from the customer. We can receive orders in many ways whether it is faxes, phone, electronic file transfer / EDI or even methods that require manual data entry. Preferred method is to receive orders via file transfer at agreed daily slot times, normally e.g. once in the morning and once in the afternoon. The files are in a pre-agreed format that can be auto uploaded into the suppliers system without any data manipulation or manual data entry. This process ensures that human error is eliminated and also streamlines the entire order cycle, making it more effective and less time consuming, (Mutangili, 2014).

By deploying an Electronic Purchase Order Requisition system, in concert with an Accounts Payable automation solution, internal control over expenses, payables, disbursements, and suppliers can be enhanced. Going electronic allows for a much more efficient payable process by eliminating many of the manual tasks generally associated with purchase order requisition. PO Requisition technology enables generation of POs and route them online for approval using Smart Routing technology. Upon approval, POs can be electronically invoiced from suppliers directly for an efficient paperless process. Automated matching occurs between the PO and the invoice when it arrives to validate price, quantity, line amount and items ordered. All invoices matched will be tracked against the PO until the PO is closed to account for blanket POs or partial payment against a PO. Matching rules can be configured for further control to ensure that invoices are properly matched to POs based on your existing business rules. Additionally, tolerances can be applied for the entire PO or down to the line item. Automated matching occurs between the PO and the invoice

when it arrives. All invoices will be tracked against the PO in the case of a blanket PO or partial payment against a PO. Matching rules can be used for further control to ensure that invoices are properly matched to POs. Additionally, tolerances can be applied for the entire PO or any detail down to the line item, (Mutangili, 2014).

E-ordering enables Network Members and their Suppliers to exchange EDI documents: POs, acknowledgements, advanced Shipment Notices and Invoices electronically Provides means for centralized billing by suppliers to members, Reporting solutions: Fill Rate Management, Price Discrepancies, Standardization – POs, ASNs, Invoices, Drill-Down reports, Internet Parts Ordering , a single website for special orders, All documents can be viewed by your staff on the EOP website, Archive – All documents for 7 calendar years plus the current year, Track shipments, approve invoices for payments, manage all online(Mutangili, 2014).

E-ordering as well as web-based ERP is the process of creating and approving purchasing requisitions, placing purchase orders as well as receiving goods and services ordered, by using a software system based on Internet technology. In the case of e-ordering the goods and services ordered are indirect goods and services (i.e., non-product related goods and services). The supporting software system (an ordering catalog system) is usually used by all employees of an organisation. In the case of web-based ERP the goods and services ordered are product-related. These are called direct goods and services. Usually only the employees of the purchasing department (or the planning department) are using the supporting software system (a web-based ERP-system (Enterprise Resource Planning)). It maybe clear that ordering of indirect goods and services usually takes place on an ad hoc basis, whereas ordering of direct goods and services usually is plan-based.

Presutti (2003) notes that some of the earliest e-procurement solutions focused on establishing ordering routines and reducing transaction costs associated with operating resource purchasing for typically maintenance, repair and operating (MRO) supplies by automating the requisitioning to payment cycle. E-business in procurement can enable organizations to order products in online catalogues or desktop purchasing systems whereby the requisitioner's authorization is electronically checked. The order information electronically passes through various checking procedures, e.g. authorization by relevant managers or directors. Once cleared, the order can be aggregated with others to the same destination and issued electronically to the supplier. This process flow reduces operational costs, improves process efficiency, delivers greater centralized control over purchasing and may increase negotiating power with suppliers through order consolidation (Huber & Wagner, 2007).

Alcatel; was the first firm to effect complete electronic orders processing for direct goods was implemented in April 2005 with the supplier Swisscom. Since then, orders, delivery confirmations and invoices for the procurement of ADSL-net infrastructure have been exchanged completely paperless. This electronic invoice processing meets the specifications of the VAT authorities, a basic requirement for the waiving of the paper invoice and for the enforcement of input tax deduction. The functions to be supplied by Alcatel, mostly a combination of products and services, are specified in a comprehensive agreement. This forms the framework for the specifications and the orders, which are activated in SAP MM-Module and then transmitted through the transaction platform Conextrade to Alcatel. The XML standard from RosettaNet is used for this. As soon as the service is accepted by Alcatel, a delivery confirmation and, subsequently, an invoice to Swisscom Fixnet are transmitted by the same path. The latter is automatically reconciled in SAP

MM-Module and finally approved for payment. (Christian Tanner, Ralf Wölfle, Michael Quade, 2006).

### **Supply Chain performance**

From an IS point of view, many tactical and operational benefits generated by procurement departments were achieved by employing web-based e-procurement systems supporting all major procurement innovations such as e-auctions, e-RFX and e-catalogs, (Rai, Brown, and Tang, 2009). Percy, Giunipero and Wilson, (2007) summarized that the use of e-auctions within sourcing processes led to purchase price reductions of 30% in cable TV equipment, 20% in power equipment, 39% in medical supplies, 37% in public utilities, and 53% in U.S. armed forces' purchases. Further, Robinson, Sahin and Gao, (2005) found that the application of an automated e-replenishment system instead of a manual-based system leads to buyer-side operational cost reductions of 19.6%, 29.5%, and 12.5% in traditional decentralized, decentralized with information sharing, and coordinated supply chain structures, respectively. Besides, supplier-provided, standardized e-catalogs along with electronically enabled self-service procurement processes disburden procurement departments from operational purchasing activities of non-production materials (Massauer 2011). Generally speaking, the benefits of e-procurement can be summarized as product-related, process-related and inventory-related efficiency gains. A lot of research on different aspects of e-procurement systems has already been conducted. These aspects include procurement performance impact, (Teo and Lai, 2009) success factors (Puschmann and Alt, 2005) adoption issues indifferent geographical areas and industries, as well a variety of related analytical approaches, e.g., for bids election (Talluri, Narasimhan, and Viswanathan, 2011). Considerable amount of research was conducted related to single e-procurement system components such as e-auctions, e-negotiation tools or reputation mechanisms.

### **Empirical review**

Ngeno and Kinoti (2017) explored the effect of e-procurement on effective supply chain management process in energy sector in Kenya. The purpose of the study was to assess the effect e-procurement on effective supply chain management process in energy sector in Kenya. The study applied the research design where both qualitative and quantitative techniques were used. The study aimed at collating and collecting information from the respondents. The study employ stratified random sampling technique in coming up with sample size of 152 respondents from a total of 246 target population in the energy sector. All the variables, that is, electronic data interchange, e-tendering, supply chain integration were found to have influence on effective supply chain management process on energy sector.

Fozia, Namusonge and Shaelle (2016) in their study, effect of electronic supplier management practices on the implementation of preference regulations on state corporations in Kenya, findings on electronic supplier management revealed that employees electronically search for new products in the market. Supplier prequalification is done electronically together with confirmation of new suppliers' references. Besides, appraisals on marginalized groups are done electronically though there is doubt whether new suppliers are searched for electronically. Also, it was not fully established whether new suppliers are evaluated electronically, if employees electronically interact with new suppliers, if employees electronically categorize new customers, whether employees electronically do E-auctions and if employees electronically do location search

### **Critique of the existing literature**

E-procurement includes negotiation with suppliers, and research and development co-ordination taking place on the internet and electronic market (Yen and Ng, 2013). Research conducted on B2C E-Commerce focus on factors which influence the

purchasing decision of the customer in the online B2C world. Furthermore much academic research on the success and fail factors for the implementation of E-Procurements as well as the benefits of E-Procurement usage was found. While the importance of online B2C shopping as well as the importance of E-Procurement systems is recognized by many academic researchers and practitioners, limited research interest was given to the effects both research fields have on each other on consumer attractiveness.

### Research gap

Barasa, Namusonge and Okwaro (2017) investigated the effects of E-Procurement on organizational performance of Public organizations focusing on Bungoma County Government. The study was guided by the specific research objectives: To establish the effects of E-Tendering on the performance of Bungoma County Government, to establish the effects of E-Auction on the performance of Bungoma County Government, to establish the effects of E-Purchasing on the performance of Bungoma County Government and to establish the effects of E-Invoicing on the performance of Bungoma County Government. The study concluded that e-tendering, e-auctioning, e-purchasing and e-invoicing affect organisational performance. The study has not linked how supply chain performance impacts on the organizational performance the gap this study intends to fill.

Fozia, Namusonge and Shaelle (2016) in their study, effect of electronic supplier management practices on the implementation of preference regulations on state corporations in Kenya, findings on electronic supplier management revealed that employees electronically search for new products in the market. Supplier prequalification is done electronically together with confirmation of new suppliers' references. Besides, appraisals on marginalized groups are done electronically though there is doubt whether new suppliers are searched

for electronically. The research was more geared towards finding out whether electronic supplier management practices were being used. This study aims at finding out whether electronic supplier management practices affect supply chain performance and come out with conclusions whether the effect on supply chain is positive or negative.

### III. RESEARCH METHODOLOGY

Mixed research design was used to gather both qualitative and quantitative data through a questionnaire, interviews and observations. The population for this survey included all the 12 sugar companies in Kenya with 7,584 employees. Stratified random sampling method was applied to come up with the sample size. This according to Cooper and Schindler (2011) ensures that each manufacturing subsector is represented. The population was stratified into departments and level of seniority (senior, middle, lower managers or non- management cadre) in all the factories. Yamane (1967:886) formula to calculate sample sizes has been used to establish the sample size,  $n = N / [(1 + N(e)^2)]$ , Where  $n$  is the sample size,  $N$  is the population size, and  $e$  is the level of precision. When this formula is applied to the population of 7584, we get Equation,  $n = 7584 / [1 + 7584(0.05)^2] = 379$ . The main data collection instrument was open and closed ended questionnaires that will be self-administered, interview sheet and observation. A variety of secondary information sources is available to the researcher gathering data on an industry, potential product applications and the market place. The study adopted Likert Five Point rating scale to capture responses in the questionnaire. Qualitative analysis was used to present the findings gathered from procurement interviews. Quantitative data was analyzed using descriptive statistical method; the statistical tools such as mean, mode and standard deviation were used. Regression analysis was applied to analyze the relationship between a single dependent

variable and independent variable. The results were fitted in the regression model below for prediction.

$$Y = \beta_0 + \beta_2 X_2 + \epsilon$$

Where: Y = Supply chain performance (value of dependent variable),

$\beta_0, \beta_2$ , are regression coefficient to be estimated

$X_2$  = E-order processing practice

$\epsilon$  = error term

#### IV. RESEARCH FINDINGS AND DISCUSSION

##### Supply chain performance

The researcher sort opinion whether E-procurement enhanced supply chain performance, majority respondents (98.1%) were of the opinion that E-procurement enhanced supply chain performance while 1.9% said it did not as shown in Table 4.1.

**Table 4. 1 Supply chain performance**

Response	Frequency	Percent
1. No	5	1.9
2. Yes	261	98.1
Total	266	100.0

##### Results of supply chain performance

From the findings in Table 4.2, the respondents indicated that the application of E-procurement practices reduces purchasing costs to a large extent (mean 4.43). Further, respondents indicated that E-procurement improved efficiency and time taken to complete procurement process with a mean of 4.52. E-procurement enhanced standardized purchasing processes across the organization (mean score of 4.31). They agreed that E-procurement had reduced administrative cost with better effectiveness (mean 4.22). Respondents agreed that E-procurement had improved effectiveness of supply chain processes (mean 4.24). E-procurement had capped on discretion and thus increased transparency (mean

4.27). Respondents agreed that E-procurement practice had improved supply chain managers decision making (mean 4.18) and that E-procurement practices had checked on errors of order transmission (mean 4.20). On the other hand, respondents also indicated that E-procurement practices had moderately reduced procurement corruption and inventory levels as indicated by the mean score of 3.85 and 3.94 respectively.

This concurs with a research that the quest to improve service delivery is becoming an important agenda for most governments (Kaliannan et al., 2009, Vaidya and Hyde, 2011; Basheka and Sabiiti, 2011) and e-procurement has been introduced as a key strategic tool in increasing nations' competitiveness (Basheka et al., 2012) and as a way to achieve better, more cost effective procurement systems, as well as greater transparency and accountability (Karthik and Kumar, 2013). Given the digital processing of all the information related to public contracts, the costs with waste paper as well as man-hours assigned for organising the administrative work processes is dramatically reduced. Similarly, the cost of travel and staff allocated to logistical tasks also tends to be residual due to the introduction of technology in the process, (Fernandes, T. and Vieira, V. 2015). This also concurs with the research, Role of E-Procurement Strategy in Enhancing Procurement Performance in State Corporations in Kenya, that as a higher percentage of enterprise spend and more spend categories flow through e-procurement systems, greater cost savings and other benefits are realized. E-procurement technology and other advanced technologies essentially are freeing procurement professionals to become true supply managers at these enterprises, and the role of procurement is shifting from reducing costs to creating supply value for the company.

**Table 4.2 Supply chain performance**

Statement	N	Mean	Std. Dev
1. Reduced purchasing costs	266	4.43	0.74
1. Improved efficiency and time taken to complete procurement process	266	4.52	0.62
2. Standardized purchasing process across the organization	266	4.31	0.69
3. Reduces administrative cost with better effectiveness	266	4.22	0.80
4. Improved effectiveness of SC processes ( std process)	266	4.24	0.76
5. Reduces discretion & increases transparency	266	4.27	0.83
6. Improved SC managers decision making	266	4.18	0.78
7. Reduction in errors of order transmission	266	4.20	0.77
8. Reduces procurement corruption	266	3.85	1.00
9. Reduction in inventory	266	3.94	1.01

**Electronic order processing practice**

Respondents were their opinion whether E-order processing practice enhances supply chain performance, majority 98.1% were of the view that E-ordering practice enhances supply chain performance while 1.9% had a contrary view as shown in table 4.3.

**Table 4.3 Electronic tendering on supply chain performance**

Response	Frequency	Percent
1. No	5	1.9
2. Yes	261	98.1
Total	266	100.0

**Results of electronic order processing practice**

From the findings in Table 4.4, respondents opined that electronic order processing practice reduced

order processing time to a large extent (mean 4.52). They agreed also to a large extent that E-order processing practice eliminated paperwork thus reduced costs to the company (mean 4.40). It was also found out that E-ordering practice substantially reduced human errors (mean 4.18). E-ordering practice helped the supply chain personnel to monitor order due dates (mean 4.24). The study found out that E-order processing practice enabled electronic invoice payment thus improved supplier relationship (mean 4.17).

Findings concur with the study of Nyagah and Mwanga (2015), Influence of e-procurement implementation on supply chain performance in dairy industry in Kenya, that there is a positive correlation between supply chain performance and E-order Processing and that E-order Processing influences supply chain performance to a great extent.

**Table 4.4 Electronic order processing practice**

Statement	N	Mean	Std. Dev
1. Reduces order processing time.	266	4.52	0.58
2. Reduces paperwork thus reduced costs.	266	4.40	0.79
3. Reduces human errors.	266	4.18	0.74
4. Assists to monitor order due dates	266	4.24	0.78
5. Electronic invoice payment improves supplier relationship	266	4.17	0.73

**Qualitative Analysis**

**Electronic order processing practice**

On E-order processing, managers were asked whether in their view E-order processing enhance supply chain performance and the benefits of E-order processing. On the first question on one theme emerged. All the procurement managers interviewed were in agreement that E-order processing enhances supply chain performance. On the second question, the themes that emerged were that E-order practice reduced order processing time

thus improved delivery of goods and services to user departments. Also it emerged that automated approvals of orders leads benefits of reduction of the amount of time from requisition submission to purchase order creation and reduces the cost of sending POs to suppliers due to lower processing overheads.

**Correlation analysis for electronic order processing practice**

Table 4.4 shows that there is a strong, positive correlation between supply chain performance and E-order processing practice, which was statistically significant ( $r = .633, n = 266, p = .000$ ). These findings indicate that there is a positive linear relationship between supply chain performance and E-order processing practice.

The second Hypothesis postulated that,

**H02:** E-order processing practice has no significant influence on supply chain performance of sugar firms in Kenya.

The results of multiple regressions, as presented in Table 4.5 revealed that E-tendering has a beta value of  $r = .633, p = .000$ ). Since the p- value is less than  $< 0.05$ , the null hypothesis was rejected. It was then concluded that there is significant relationship between E-order processing practice and supply chain performance.

**Table 4.5 Correlation for electronic order processing practice**

Variable	correlation	Supply chain performance	E-order processing practice
Supply chain performance	Pearson correlation	1	.633*
	Sig. (2-tailed)		.000
	N	266	266
E-order processing practice	Pearson correlation	.633*	1
	Sig. (2-tailed)	.000	
	N	266	266

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

**Model summary electronic order processing practice**

The model for the construct customer service was tested. The findings as indicated in Table 4.6 shows the coefficient of determination and  $R = 0.633$  R Square = 0.401 at 0.05 at significance level. The coefficient of determination indicated that 40.1% of the variation on supply chain performance is explained by e-order processing practice. This shows that there existed a positive correlation coefficient between E-tendering and supply chain performance.

**Table 4.6 Model summary E-order processing practice**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.633	0.401	0.399	0.436

a. Predictors: (Constant), E-order processing

**ANOVA for electronic order processing practice**

Table 4.7 shows that the probability value of 0.000 indicates that the regression relationship is highly significant in predicting how E-order processing affects supply chain performance of sugar firms. The F calculated at 5% level of significance was 176.760 and since F calculated is greater than the F

critical (value = 5.1922), this shows that the overall model is significant.

**Table 4.7 ANOVA for E-order processing practice**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	33.676	1	33.679	176.76	.000
Residual	50.3	264	0.191		
Total	83.979	265			

a. Predictors: (Constant), E-order processing

b. Dependent Variable: Y

**Regression for electronic order processing practice**

Table 4.8 provides the information needed to supply chain performance from influence of E-order processing. Both the constant and E-order processing practice contribute significantly to the model. The regression equation is presented as follows; Supply chain Performance = 1.468 +0.633 (E-order processing). The regression model has established that supply chain performance will equal to 1.468 when e-order processing equal to zero. The finding presented in table 4.30 also show that supply chain performance is predicted to improve by 0.633 when E-order processing goes up by one unit. At 5% level of significance and 95% level of confidence, E-order processing practice had p-value of 0.000 level of significance indicating that E-order processing is statistically significant (p< 0.05). The predictor (E-order processing) has a low p-value hence it is likely to be a meaningful addition to the model because changes in the predictor's value are related to changes in the response variable.

**Table 4.8 Regression for E-order processing practice**

Model 1	Unstandardized Coefficients	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	1.468	0.207		7.106	.000
E-order processing	0.633	0.048	0.633	13.295	.000

a. Dependent variable: supply chain performance

**V. SUMMARY**

**Electronic order processing practice**

To answer the second research question, how does E-order processing practice influence supply chain performance of the sugar firms in Kenya? The study found out that E-order processing practice enhances supply chain performance, majority 98.1% were of the view that E-ordering practice enhances supply chain performance while 1.9% had a contrary view. E-order processing practice reduces order processing time, reduces paperwork thus reduced costs, reduces human errors, assists to monitor order due dates and electronic invoice payment improves supplier relationship as indicated by mean scores of 4.52, 4.40, 4.18, 4.24 and 4.17 respectively.

**VI. CONCLUSION**

**Electronic order processing practice**

It was concluded that there is significant relationship between E-ordering practice and supply chain performance as results of r= 0.633, p = 0.000. Since p value, 0.000 is < 0.05, the null hypothesis was rejected. Therefore, E-order processing practice enhances supply chain performance as it reduces order processing time, reduces paperwork thus reduced costs, reduces human errors, assists to monitor order due dates and electronic invoice payment improves supplier relationship.

**Managerial recommendations**

The study found out that E-order processing practice enhances supply chain performance. It is recommended that in order to achieve maximum benefits of reduced order processing time, reduced costs, reduced human errors and improved delivery, management should enhance electronic system and insist on all orders being processed electronically.

### Areas for Further Research

The researcher recommends further research to document findings on the achievements of electronic order processing. This should cover issues such as cost, time quality and corruption. Researchers to apply various measuring methods in order to fully track and understand how benefits are distributed.

### REFERENCES

- Ali, A., Namusonge, G. & Sakwa, M. (2016). *Effect of Firm Managerial Risk Aversion on Corporate Hedging of Listed Firms in Nairobi Securities Exchange in Kenya. IJRDO – Journal of Business Management*, 2 (7), 45-64.
- Amayi, F. K. (2011). *Factors Affecting Procurement in the Public Service: a Case Study of the State Law Office. Eldoret: Moi University.*
- Awino Z. B. (2011). *An empirical investigation of selected strategy variables on firm's performance: A study of supply chain management in large private manufacturing firms in Kenya, Journal of Public Administration and Policy Research* Vol. 3, 228-236.
- Barngetuny D. & Kimutai, G. (2015), *Effects of e-procurement on supply chain management performance in Elgeyo-Marakwet County. International Academic Journal of Procurement and Supply Chain Management*, 1 (5), 99-120
- Basheka, B., Oluka, P. and Mugurusi, G. (2012) 'Adopting new approaches for public procurement efficiency: critical success factors (CSFs) for the implementation of e-procurement in Uganda's public sector', *International Journal of Procurement Management*, Vol. 5, No. 6,712–732.
- Bilali, J & Bwisa, H. (2015). *Factors influencing the Adoption of e-Procurement: A case of Garissa County Government. The Strategic Journal of Business & Change Management*
- Fernandes, T. and Vieira, V. (2015). 'Public e-procurement impacts in small- and medium-enterprises', *Int. J. Procurement Management*, Vol. 8, No. 5, pp.587–607
- Fozia, Namusonge and Dr. N. Shaelle (2016). *Effect of electronic supplier management practices on the implementation of preference regulations on state corporations in Kenya. International Journal of innovative research and development*, November, 2016 Vol 5 Issue 13, ISSN 2278 – 0211, 227- 234.
- Gitahi, L. (2011). "Exceptional Customer Relationship is the Key to Our Success" *Nation Builder Newsletter.*
- Kaliannan, M., Awang, H. and Raman, M. (2009) 'Electronic procurement: a case study of Malaysia's e-perolehan (e-procurement) initiative', *International Journal of Electronic Governance*, Vol. 2, Nos. 2–3, pp.103–117.
- Karthik, V. and Kumar, S. (2013) 'Investigating 'degree of adoption' effects on e-procurement benefits', *International Journal of Procurement Management*, Vol. 6, No. 2, pp.211–232.
- Kioko and Mwangangi (2017), *the influence of e-procurement on performance of parastatals in Kenya. International Journal of Supply*

- Chain and Logistics*, ISSN 2520-3983  
(Online) Vol.1, Issue No.3, pp 19 - 45, 2017
- Koorn R., Smith, D. & Mueller, C. (2001) *e-Procurement and Online marketplaces*. Amsterdam, The Netherlands: Compact
- Makau, J. K. (2014). *Challenges facing adoption of electronic procurement in public sector in Kenya: A case of Nairobi Water and Sewerage Company*. *International Journal of Social Sciences and Entrepreneurship*, 1 (11), 267-286.
- Mburu, S. Njeru, A. (2014). *Factors Affecting Procurement Performance in the Milk Processing Firms in Kiambu County*. *International Journal of Science and Research*. ISSN (Online): 2319-7064
- Muhia, D. W. and Afande, F. O. (2015). *Adoption of e-procurement strategy and procurement performance in State Corporations in Kenya: A Case of Kenya Revenue Authority*. *Industrial Engineering Letters*. 5(6), 1-24.
- Mutangili, S. K. (2014). *An assessment of the adoption of e-procurement application systems on supply chain management environment in Kenya: A case of Zain Kenya Limited*. *International Academic Journals*, 1 (1), 38-61
- Nafula and Namusonge (2017), *effect of e-procurement practices on efficiency frontier of Kakamega county government*, *International journal of social sciences and technology*, 2147- 2157, ISSN 2412-0294
- Namusonge, G. S. (2010). *Business Statistics: Concepts and Applications*. Beau Bassin, Mauritius: VDM Publishing House Ltd.
- Ngeno and Kinoti, (2017), *Effect of e-procurement on effective supply chain management process in energy sector in kenya*.
- International Journal of Supply Chain Management* ISSN 2518-4709(Online) Vol.2, Issue 3 No.4, pp 18 - 37, 2017
- Nyagah, Kaimuri Hellen& Patrick Mwanga, (2015). *Influence of e-procurement implementation on supply chain performance in dairy industry In Kenya: a case of new Kcc limited*. *International Journal of Innovative Social Sciences & Humanities Research* 3(2):31-47.
- Public Procurement Oversight Authority, (2014). *Quarterly Bulletin*. Issue No. 04, December 2014, *Trends in Electronic Procurement in Kenya*, Website: [ppoa.go.ke](http://ppoa.go.ke), Retrieved 2014. [wepoa.go.ke](http://wepoa.go.ke)
- Public Procurement Oversight Authority, (PPOA), (2009). *The long term policy framework for public procurement in Kenya, Draft zero*.
- Puschmann, T. and Alt, R. (2005). 'Successful use of e-procurement in supply chains', *International Journal of Supply Chain Management*, Vol. 10, No. 2, pp.122–133.
- Talluri, Narasimhan, and Viswanathan, (2007). *Information technologies for procurement decisions: a decision support system for multi-attribute e-reverse auctions.*” *Int. J. Prod. Res.*
- Waniani, Namusonge and Lagat (2016), *in their study, Factors Affecting Implementation Of E-Procurement In Nzoia Sugar Company Limited in Bungoma County, Kenya*. *International Journal of Recent Research in Social Sciences and Humanities (IJRRSSH)* Vol. 3, Issue 2, pp: (134-150), Month: April 2016 - June 2016, Available at: [www.paperpublications.org](http://www.paperpublications.org)
- Yamane Taro. (1967). *Statistics: An Introductory Analysis*, 2nd Ed., New York: Harper and Row.