International Journal of Innovative Social Sciences & Humanities Research 3(2):31-47, April-June 2015

© SEAHI PUBLICATIONS, 2015 **www.seahipaj.org** **ISSN: 2354-2926**

INFLUENCE OF E-PROCUREMENT IMPLEMENTATION ON SUPPLY CHAIN PERFORMANCE IN DAIRY INDUSTRY IN KENYA: A CASE OF NEW KCC LIMITED.

[1]NYAGAH, Kaimuri Hellen & Patrick MWANGANGI[2]
[1]M.Sc Scholar Procurement And Logistics,
Jomo Kenyatta University Of Agriculture And Technology, Kenya
Lecturer, Jomo Kenyatta University Of Agriculture And Technology, Kenya

ABSTRACT
E-procurement is gaining popularity in today's competitive business world. Businesses using e-procurement benefit have from shorter lead times, cost reduction, improved quality collaboration, flexibility in the supply chain among others. The purpose of the study was to examine the influence of e-procurement on supply chain performance in dairy industry in Kenya with respect to New KCC. The study adopted descriptive research design. The target population was 1500 employees working in New KCC Limited from all levels of management. The study used stratified sampling technique to come up with 150 participants. A structured questionnaire was used as data collection method. Data analysis was done using qualitative and quantitative analysis methods with the help of Statistics Package for Social Science (SPSS). Regression analysis was used to test the relationship between the independent variable (ERP, Electronic Order processing, and information sharing and supplier appraisal) and supply chain performance. The study established that there is a positive correlation between dependent variable; supply chain performance and independent variables; ERP, E-order Processing, information sharing and E-supplier appraisal. The study concludes that ERP, E-order Processing, information sharing and E- supplier appraisal influences supply chain performance to a great extent. The study recommends that organization should pay attention on independent variable if supply chain performance has to improve.
Keywords: E-procurement, supply chain performance**,** E-order processing

INTRODUCTION
Supply chain involves all the activities concern with the transformation of raw materials into finished goods, flow to the end user and flow of information. According to Lambert & Cooper (2000), supply chain performance requires integration of key business activities from the supplier to the end user. This was affirmed by Narasimhan and Kim (2002) who noted that supply chain performance can be enhanced by different functions working together with seamless interface across processes.

According to Winser (2005), a firm should have strategic fit to attain supply chain performance. This calls for supply chain capabilities such as aligning e-procurement applications with overall corporate strategy. As noted by Lee (2004), supply chain performance can also improve if it is more agile. An agile supply chain can be able to react to short term changes quickly. This can be enabled by the use of e-procurement since it enables high responsiveness, fast responses and cost cutting in the supply chain (Lee, 2004). E-procurement allows efficiency hence shorter lead time's .according to Gunasekaran (2001), order cycle time is the order sourcing time which is the time the order is received until it is replenished. Christopher (1992) noted that supply chain responsiveness reduces due to reduction in order cycle time. Supply chain performance also result from firms' efficiency. efficiency can be enhanced and not limited to; flow of product, delivery performance, order fulfillment lead time, supply chain responsiveness, production flexibility, and inventory cost, better discounts among others which result to improved quality, cost reduction and shorter lead time thus there is entire improvement in the supply chain.

Harink (2003) defined e-procurement as the use of various forms of communication technology at various stages of procurement and it may include receipt registration, negotiation, search, order placing, need

identification, sourcing and payment. Another approach is given by Kim &Shunk (2004), who says that e-procurement is procurement of goods and services using internet technology. To affirm this, De Boer et al (2002) argued that using web employees can make orders directly from their computers. According to Gebauer & Seger (2001), e-procurement uses internet to publish request for quotation (RFQ), request for proposal (RFP), to support procurement activities, to establish e-market places, to build catalog and negotiation. This is well supported by Presutti (2003) who argued that e-procurement uses internet in all procurement stages and activities such as specification development, supplier selection, and negotiation and supplier assessment.

E-procurement started in the developed countries and spread out to developing countries due to use of internet. Many studies have revealed much concerning some of the early implementers of e-procurement. In Brazil studies done by Sigulem & Zucchi (2009), indicates that real saving can be achieved through E-procurement. In India, studies done by Salkute &manager (2012), shows that e-procurement adoption in India is influenced by cost benefits. Transparency International (2006) noted that e-procurement facilitated information flow between the procuring entities and the supplying firms in Brazil. In other countries like Chile, Mexico, Peru and Venezuela, e-procurement is must apply in every step of procurement process. In Philippine e-procurement is used for transactional and information exchange during procurement since e-procurement is not fully developed .the report further noted that in Malaysia, e-procurement enhanced use of open e-procurement competitive tender to curb corruption which is estimated to have reduced by 5.9% compared to earlier figures 3.7% when paper work was used.

The government of Kenya considers ICT as a key pillar in success of vision 2030 which targets to transform this country into an industrialized nation. As a step to achieving this, The Government has moved to set up ICT centers without forgetting the laptop project for primary schools is also under way. Studies done by Njuguna (2009) reveals that a fully ICT board has been set up by the government to spearhead the ICT revolution in the country which is a positive signal to e-procurement. Recently the ministry of Finance with the support of PPOA came up with a mandate of establishing e-procurement alongside IFMIS in public institutions. The government of Kenya is currently advocating for adoption of e-procurement by all public procuring entities to ensure there is transparency, effectiveness, accountability and reduction in corruption.

Statement of the Problem

Despite e-procurement gaining popularity due to globalization, technological changes and advancement, there are businesses that still carry out some activities manually. According to PPOA (2013), in public sector, most procurement processes are still manual and internet is only fully used in web browsing and in e-mails. According to studies done by Malela (2010),Dairy industry have manual processes which are slow, costly, inefficient and lead to poor data storage and retrieval. This has resulted poor performance in supply chain. Statistics available in the New KCC 2012/2013 annual report indicate that 103.7 Million liters of milk were received and processed reflecting a 3% decline from 103.2 Million liters processed in the previous year. A loss of Ksh.384.9M in the year 2012/2013 from a profit of Ksh.302.3M in previous year was registered (New KCC annual report.).

Studies done on e-procurement by (Subramanian, 2003; Wanyika, 2012; Kaisa, 2013& Mutunga, 2013) indicated that there is a close relationship between e-procurement and supply chain performance. In spite of all these studies, little research has been done on influence of e-procurement in dairy industry in Kenya. Thus purpose of this study is to fill this gap by examining the influence of E-procurement in supply chain performance in dairy industry in Kenya with reference to New KCC Limited and specifically looking at implementation of ERP, E-order processing, information sharing and E-supplier appraisal.

Research Objectives

The main objective of the study was to determine the influence of e-procurement implementation on supply chain performance in dairy industry in Kenya. The specific objectives are:

a) To find out if ERP has influence on supply chain performance in dairy industry in Kenya
b) To evaluate the influence of E-order processing in supply chain performance in dairy in Kenya
c) To establish if information sharing has influence on supply chain performance in dairy industry in Kenya.

d) To find out if E- supplier appraisal has influence on supply chain performance in dairy industry in Kenya.

Research Questions

a) Does ERP influence supply chain performance in dairy industry?
b) To what extent does E-order processing influence supply chain performance in dairy industry?
c) How does information sharing influence supply chain performance in dairy industry?
d) To what extent does E-supplier appraisal influence supply chain performance in dairy industry?

Theoretical review

The study was based on the principles of constraints theory, Rogers's innovation diffusion adoption Model, agency theory and Technological acceptance Model (TAM)

Theory of Constraints

As discussed by Goldratt (1990a), the theory of constraints (TOC) has been referred as a management philosophy which aims to cause improvement by focusing on a constraint that hiders a system from achieving targeted performance. According to Goldratt and Cox (1992), constraint is any element or factor that limits the system from achieving targeted goals thus a firm need to understanding of these constraints and mitigation since every organization must have a constrain which can be used by businesses in making a decision on whether to implement ERP or not. Goldratt (1990), argues that a firm needs to understand the goals and purpose of system implementation and also to use change as management philosophy so as to consistently achieve their goals by getting a linkage from business constraints to performance constraints. According to Stephenson (2007), ERP enhances organizations to have control over suppliers and distributors thus bridging the gap between in the supply chain since all members can be able to share vital information on time. The study will use constraints theory in determining the need for implementation of ERP as a system that will provide integrated business processes despite the constraints available. This led to the research question does ERP influence supply chain performance in dairy industry in Kenya?

Roger's innovation diffusion adoption Model

Rogers, (1995) argues that technology adoption results from attributes focused on technology such as relative advantage, how compatible the system and how simplified the system is. It also considers innovation, communication channels and how adoption decisions are made. Evan & Wruster, (2001) argued that ICT enables greater information to be widely available with ability to offer access to large catalogues of suppliers, wide range of product and services available to employees who in turn provide greater range flexibility. This makes E-order processing achievable through systems such as VMI and EDI which allow well integrated system.

Rogers emphasizes the nature of the social system by including network connectedness and inter-relationships among users. How large and how interconnected industrial network that the organization operates in can influence decisions as well (Lundblad, 2003). This leads to the second research questions; does e-order processing influence supply chain performance?

The Technology Acceptance Model (TAM)

Electronic procurement (e-procurement), as an information technology application, consists of a useful tool for administrators to save money and increase organizations' effectiveness and efficiency. Process cost savings, reduced administration costs, decrease in costs through reduced staffing levels, increased quality through increased competition, reduction in time through improved internal workflow and shortened overall procurement cycle times compose some of the benefits that stem of e-procurement process (Eadie, Perera& Heaney, 2010; Davila, Gupta & Palmer, 2003). Davis (1986; 1989; 1993) developed and validated the Technology Acceptance Model (TAM) to explain the mechanisms that influence and shape users' acceptance of new information technology. According to TAM, there are two specific variables that are fundamental determinants of users' attitude toward using information technology and actual use of the system: perceived usefulness and perceived ease of use relatively to new information system design features. .

Many researchers have conducted empirical studies to examine the explanatory power of the TAM, which produced relatively consistent results on the acceptance behavior of IT end users (Venkatesh & Davis, 2000). In summary, TAM provided an explanation of the determinants of technology acceptance that enables explanation of user behavior across a wide scope of end-user information technologies and user

populations (Davis *et al*, 1989). The theory triggers the third question: does information sharing influences supply chain performance in dairy industry?

Agency Theory

Agency relationship as defined by Jensen and Meckling(1976),is a contract where one or more persons delegate work to another person to do the work on their behalf. The agent is required to execute tasks that are within the principal agent relationship considering actions that have consequences for both the principal and the agent. They further argued that these consequences can have both negative and positive impact for each of the actor. Desires and goals of principal and agent are two problems that can arise and it's difficult for principal to verify what the agent is doing. According to this theory there should be contract and monitoring of work to eliminate opportunism from suppliers though this may not be sufficient to cope with the problem since consultants are more informed on the problem area than the procuring entity. In relation to agency theory, procurement has two parts with different goals .it involves a buyer and supplier or many suppliers who compete for the contract. With this in mind I intend to use principal agent theory to explain the importance of having the right supplier in the market. This is because it can help to study outcomes and decision making concerning suppliers. This triggers the research question; does electronic supplier evaluation influence supply chain performance?

Conceptual Framework

A conceptual framework shows the relationship between dependent and independent variables. The dependent variable in this case is supply chain performance and independent variable will be ERP, E-order processing, information Sharing and E-supplier appraisal.

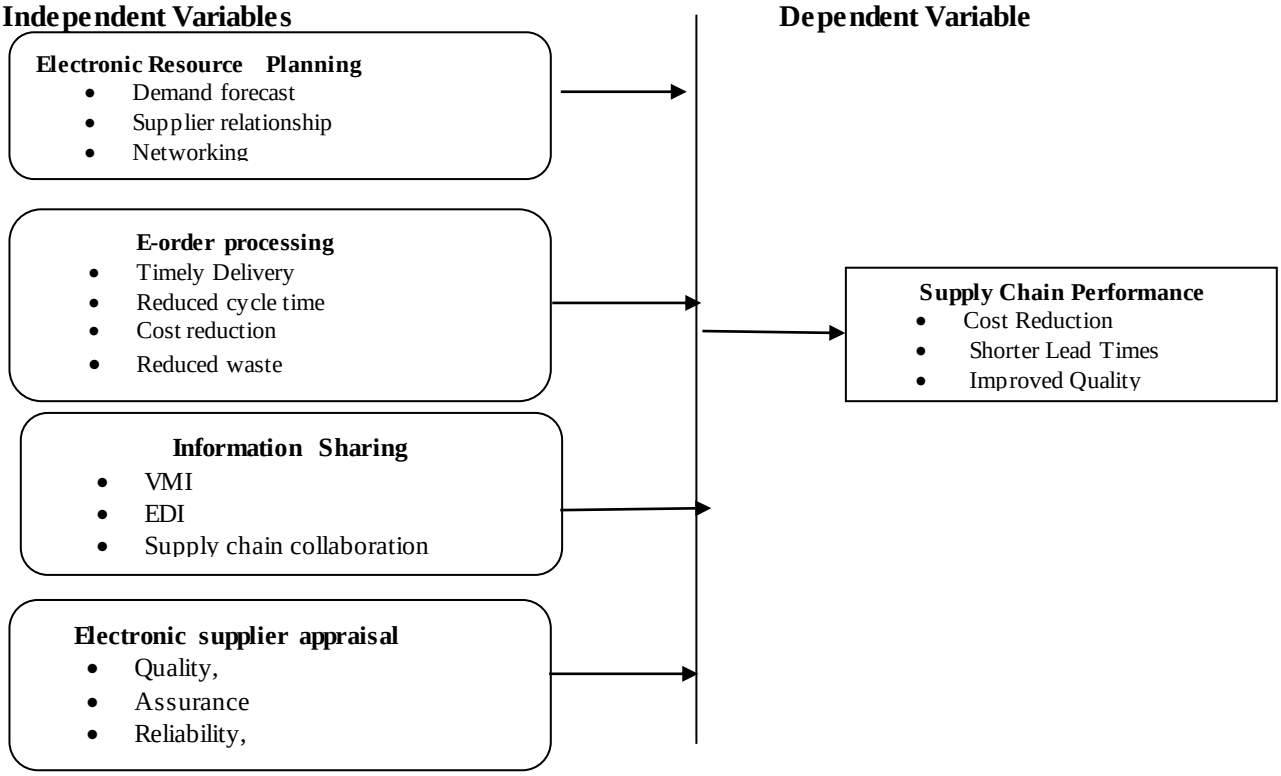

Figure 1. Conceptual frame work

RESEARCH DESIGN AND METHODOLOGY

The study used descriptive research design. The target population was 1500 New KCC employees According to Kothari (2010), a representative sample should be at least 10% of the population thus; a sample of 10% will be taken from the population of 1500 New KCC employees.

Table 1. Sample Size

Population Category	Population	Sample Size	Percentage
Top Management	100	10	7%
Middle Management	350	35	23%
Low Level Management	450	45	30%
Support Staff	600	60	40%
Total	**1500**	**150**	**100%**

Source: New KCC HR Manual, **(2014)**

Data Collection Procedures & Instruments

The data collection instrument in this study was questionnaires. The research questions were both open ended and close ended. Partially Open ended and closed ended allow ease data analysis, interpretation and tabulation of questionnaire (Mugenda & Mugenda, 2003).

The Questionnaire was divided into four sections representing each of the four research variables to ensure adequate data. The questionnaires were hand-delivered and collected after five days to give everyone a chance to fill them. The study targeted a sample size of 150 respondents from which 135 filled in and returned the questionnaires making a response rate of 90%.

Data Collection Procedures

This included both the primary and the secondary data. This included raw facts to be collected from different levels of management from New KCC employees by the use of a questionnaire.

Secondary data involves past data that had been previously collected and tabulated through use of graphs charts and reports. The data was collected through the review of existing literature, internet, books, journals and reference materials with information related to the study.

Reliability and Validity

A pilot study was carried out to determine reliability of the questionnaires. The pilot study involved the sample respondents. Reliability analysis was subsequently done using Cronbach's Alpha which measured the internal consistency by establishing if certain item within a scale measures the same construct. Gliem and Gliem (2003) established the Alpha value threshold at 0.7, thus forming the study's benchmark. Cronbach Alpha was established for every objective which formed a scale. The E-Supplier appraisal had the highest reliability (α= 0.853), followed by Electronic Resource Planning (ERP) (α=0. 832), Electronic Order Processing (α=0.784), and Information sharing (α=0.754). This illustrates that all the four variables were reliable as their reliability values exceeded the prescribed threshold of 0.7.

Data processing and Analysis

The data collected was analyzed qualitatively and quantitatively. This is because qualitative analysis provides in-depth information of the study while quantitative analysis enable the use of statistics to give better understanding of data collected. The final information was presented by use of percentage, tables, graphs and pie chart. The quantitative data from the questionnaire was analyzed using the Statistical Package for the Social Sciences (SPSS) and Microsoft Regression and Correlation analysis was also carried out to determine the relationship between dependent(supply chain performance) and independent variables (ERP, Electronic order processing, information sharing and E- supplier appraisal) Thus the regression model was as follows:

$$\mathbf{Z = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5}$$

$\mathbf{b_0}$ is the regression intercept; **Z** is the dependent variable (supply chain performance) ; b_1-b_4 are the regression coefficient; $\mathbf{X_1}$ is Electronic Resource Planning, $\mathbf{X_2}$ is E-order Processing , $\mathbf{X_3}$ is Information sharing , $\mathbf{X_4}$ is E-supplier appraisal; $\mathbf{b_1}$- $\mathbf{b_4}$ are the regression coefficient; b_5 is the error term.

On the other hand qualitative analysis which entailed words or pictures by collecting data, recording peoples experiences selected was analyzed by organizing into similar themes and tallying the number into similar responses. The result was presented using bar graphs, pie charts and distribution tables.

RESULTS AND DISCUSSION

Demographic information

The study sought to find out the demographic information of the respondent which included gender, period of service, level of education and work department.

Gender distribution

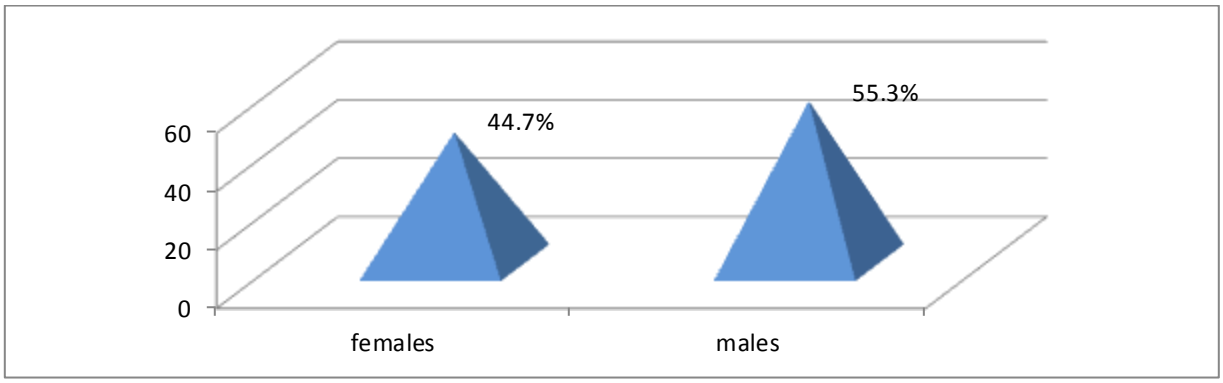

Figure 2: Gender distribution of Respondent

The study sought to determine the gender distribution in New KCC Limited so as to establish whether there was any gender disparity. The findings indicate that majority of the respondents as shown by 55.3% were males whereas 44.7% of the respondents were females, this is an indication that both genders were fairly involved in this research and thus the findings of this study did not suffer from gender biasness. It also implies that there is gender equality in New KCC Limited.

Period of service of Respondent

The study sought to establish respondent period of service classified as less than 2years, 3 to 5 years, 6 to 9 years and above 10 years. This was to determine whether the respondent were in a position to give credible information relating to the study.

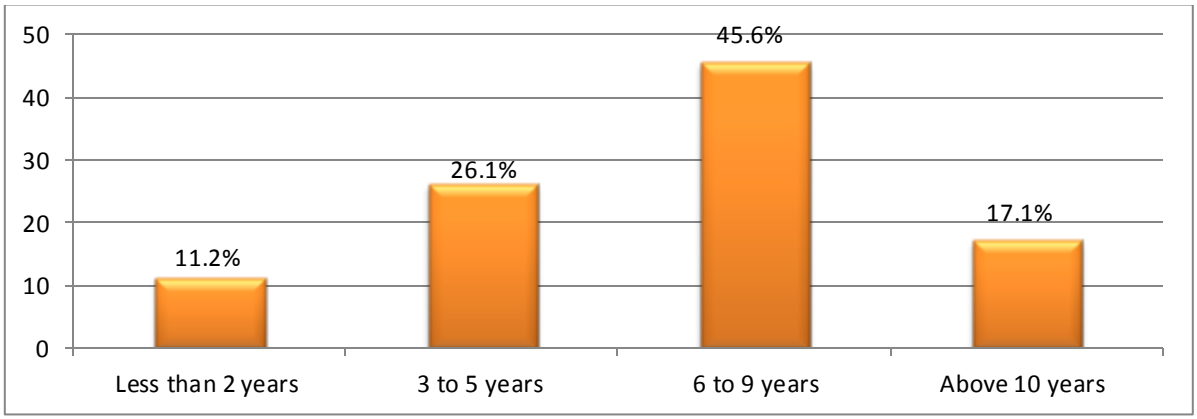

Figure 3. Period of service

From the findings in Figure 3, most of the respondents as shown by 45.6% indicated to have served for a period of 6 to 9 years, 26.1% of the respondents indicated to have served for a period of 3 to 5 years, 17.1% of the respondents indicated to have served for a more than 10 years whereas 11.2% of the respondents indicated to have served for a period of not exceeding 2 years. This implies that majority of the respondents had served for a considerable period of time which implies that they were in a position to give credible information relating to this study.

Level of Education of Respondent

The study also considered establishing the level of education of the respondent .this was to ascertain whether they had relevant skills in their area of specialization and also to establish if they were well equipped to perform their duties.

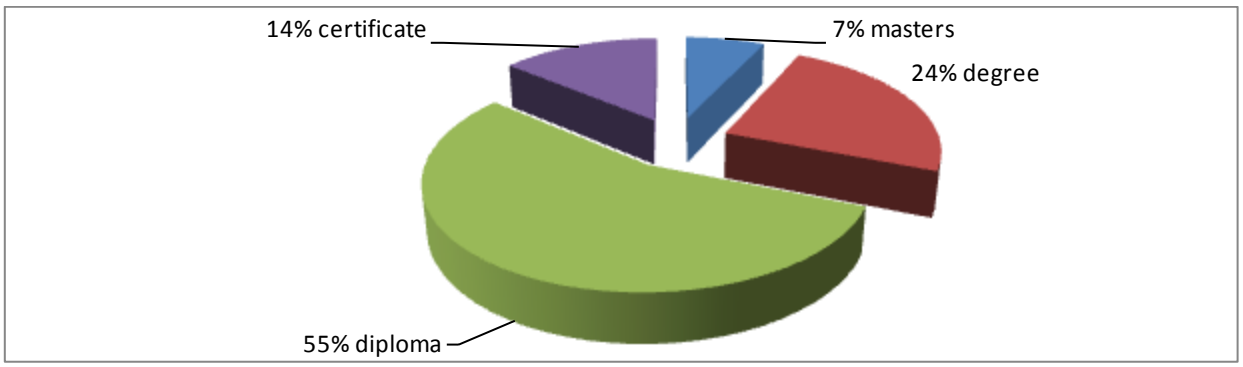

Figure 4: Educational qualification

On highest level of education achieved, the study revealed that most of the respondents as shown by 55% had college diploma certificates, 24% of the respondents held bachelor's degrees, 4% of the respondents held college certificates while 7% of the respondents held masters degrees. This implies that respondents were well equipped and had skills to perform various duties. Williamson (2009) support this finding that those with higher education or have specialized skills are more successful due to advanced knowledge and better skills in decision making.

Extent to which ERP influence supply chain performance

The study sought to determine the extent to which ERP influence supply chain performance in dairy industry in Kenya, from the research findings, majority of the respondents as shown by 81(60%) indicated that, ERP influence supply chain performance in dairy industry in Kenya, to a great extent, 24(17.8.%) of the respondents indicated to a very great extent 20(14.8%) of the respondents indicated to a moderate extent whereas 10(7.4%) of the respondents indicated to a little extent. The study also evaluated the extent in which some aspect of ERP applies to supply chain performance

Table 2: Extent to which ERP influence supply chain performance in dairy industry in Kenya

Extent	Frequency	Percentage
Very great extent	24	17.8
Great extent	81	60.0
Moderate extent	20	14.8
Little extent	10	7.4
Total	**135**	**100**

The study sought to reveal the extent to which respondents agreed with the above statements relating to ERP (Table 3). From the research findings respondent with a mean of 4.14 agreed that e-procurement allows the company to integrate business processes with their global supply chain partners, on whether e-procurement enables cheaper and faster acquisition of materials, respondent agreed by the mean of 4.16. On whether the company has facilities which enhance networking with all the supply chain partners, respondents agreed with a mean of 4.13. Majority of the respondents agreed to a great extent that; the company has automated order processing system allowing faster order approvals as shown by a mean of 4.19, as to whether e-procurement promotes positive relationship with suppliers and customers, respondent as shown by a mean of 4.07 were in agreement. On whether implementing ERP can promotes internal and external communication, respondent by a mean of 4.03 were in agreement. From the findings on whether the company is able to carry out proper demand forecast and quick response to change, respondent by the mean of 4.03 were in support of this aspect. The analysis also revealed a low standard deviation which implies that respondents were of similar opinion.

The study further established that Integrating supply chain processes help in demand forecast, improving supplier relationship and networking in supply chain. The findings concur with Tan (2001), who argues that a well-integrated supply chain ensures coordination of flow of materials and information along the supply chain.

Table 3: The extent in which the respondents agree with the Statements relating to ERP on supply chain performance

Aspects of ERP	not at all	little extent	moderate extent	great extent	Very great extent	Mean	Std deviation
E-procurement allow our companies to integrate business processes together with their global supply chain partners	1	4	13	74	43	4.14	0.23
E-procurement enables faster and cheaper acquisition of materials.	5	4	3	75	48	4.16	0.24
Our company has facilities which enhance networking with all the supply chain partners.	3	2	5	89	36	4.13	0.28
Our company has automated order processing system which allows faster order approvals	2	3	4	85	41	4.19	0.27
E-procurement enables New KCC to have Positive relationship with suppliers and customers	1	5	8	91	30	4.07	0.28
Implementation of ERP can promote internal and external communication.	3	2	4	105	21	4.03	0.33
Our company has a system that enables proper demand forecast and quick response to change.	4	5	7	86	33	4.03	0.26

Electronic Order Processing

Table 4: Extent to which Electronic Order Processing influence supply chain performance in dairy industry in Kenya

Extent	Frequency	Percentage
Very great extent	38	28.1
Great extent	74	54.8
Moderate extent	15	11.1
Little extent	8	5.9
Total	**135**	**100**

The study sought to determine the extent to which Electronic Order Processing influence supply chain performance in dairy industry in Kenya. From the research findings as shown in Table 4, majority of the respondents as shown by 74(54.8%) indicated that, Electronic Order Processing influence supply chain performance in dairy industry in Kenya, to a great extent, 38(28.1%) of the respondents indicated to a very great extent 15 (11.1%) of the respondents indicated to a moderate extent whereas 8 (5.9%) of the respondents indicated to a little extent. This implies that, Electronic Order Processing influences supply chain performance in dairy industry in Kenya to a great extent

Table 5: Effects of Electronic Order Processing on supply chain performance in dairy industry in Kenya.

Aspects of Electronic Order Processing	not at all	little extent	moderate extent	great extent	Very great extent	Mean	Std deviation
Focusing on e- procurement can make company's supply chain more efficient thus reduction in waste.	5	2	5	96	27	4.02	0.30
e-procurement has the potential to streamline inefficient procurement process by removing the manual and paper-based procurement systems	2	4	6	74	49	4.21	0.24
Electronic order processing allows placement of right and timely order hence elimination of unnecessary waste and delays.	3	3	4	89	36	4.13	0.28
Electronic order processing enables our company to enjoy faster order authorizations, approvals and processing hence shorter lead times.	4	4	5	80	42	4.13	0.25

The study sought to reveal the extent to which respondents agreed with the above statements relating to effects of Electronic Order Processing on supply chain performance. From the research findings (Table 5), respondent with a mean of 4.02 agreed that focusing on e- procurement can make company's supply chain more efficient thus reduction in waste ,majority of the respondents agreed that e-procurement has the potential to streamline inefficient procurement process by removing the manual, paper-based procurement systems as shown by a mean of 4.21, on whether electronic order processing allows placement of right and timely orders leading to elimination of unnecessary waste and delays, respondent by the mean of 4.13 supported it while a mean of 4.13 on the other hand were for the opinion that Electronic order processing enables a company to enjoy faster order authorizations, approvals and processing hence shorter lead times. The analysis also revealed a low standard deviation which implies that respondent were of similar opinion .The findings above are in line with findings by Minhan (2001) that improved order process is a key benefit of e-procurement where order fulfillment time can be shortened by up to 80 percent.

Information Sharing

Table 6: Extent to which Information Sharing influence chain performance in dairy industry in Kenya

Extent	Frequency	Percentage
Very great extent	45	33.3
Great extent	64	47.4
Moderate extent	16	11.9
Little extent	10	7.4
Total	**135**	**100**

The study sought to determine the extent to which Information Sharing influences supply chain performance in dairy industry in Kenya, from the research findings, most of the respondents as shown by 64(47.4%) indicated that, Information Sharing influence supply chain performance in dairy industry in Kenya, to a great extent, 45(33.3%) of the respondents indicated to a very great extent 16(11.9%) of the respondents indicated to a moderate extent whereas 10(7.4%) of the respondents indicated to a little extent.

Table 7: Statements relating to influence of Information Sharing on supply chain performance .

Aspects of Information Sharing	not at all	little extent	moderate extent	great extent	Very great extent	Mean	Std deviation
Our company has various IT infrastructure that link with suppliers, partners and all plants	2	1	6	87	39	4.19	0.27
E-procurement allows our company to be market sensitive through capturing and transmission of point of sale data.	1	5	5	65	59	4.30	0.24
Our company has structure that promotes proper sharing of information about the market with all the supply chain stakeholders.	3	2	8	90	32	4.08	0.28
Our company avails information about its product in the internet and in various websites.	4	2	4	83	42	4.16	0.26
New KCC Limited uses system that allows suppliers to access information about their inventory level to manage frequency, quantity and timing.	3	4	7	94	27	4.02	0.29
Information technology can speed up the time it takes new products to reach the market.	3	6	7	84	35	4.05	0.25
New KCC management is able to access information on inventory level for each plant from the main office	4	5	2	76	48	4.18	0.25

The study found it necessary to find out the extent to which respondents agreed with the above statements relating to effects of information sharing on supply chain performance. From the research findings, respondent with a mean of 4.19,agreed that the company has IT structures that link with suppliers, partners and its plants, majority of the respondents agreed that; e-procurement allow a company to be sensitive through capturing and transmission of point of sale data, as shown by a mean of 4.30, respondents by a mean of 4.08 agreed that New KCC Limited has structures that promote proper sharing of information about the market with all the supply chain partners, on the aspect of the company availing information about its products in the internet and in various websites, a mean of 4.16 was in agreement. The study also wanted to find out whether New KCC Limited has a system that allow supplier to assess information about their inventory level to manage frequency, quantity and timing and respondent by a mean of 4.02 were in agreement. On whether information technology can speed up the time it takes the new product to reach the market, respondent with a mean of 4.05 agreed whereas respondent with a mean of 4.18 agreed that New KCC management is able to access information on inventory level for each plant from the main office. The study revealed that the standard deviation range from 0.24 to 0.29 which indicates that most respondent were of a similar opinion. The study also revealed that effective information sharing helps the supply chain improve the efficiency and productivity of its operations by enabling all members to share demand and operational information .the above findings concur with the findings by Lau &Lee(2000) that information sharing enables companies to have controlled sharing of processes thus enhancing effectiveness of

information interchange among business partners and suppliers and that organization should be able to establish structures that will enhance data capturing and transmission.

E- Supplier appraisal

Table 8: Extent to which E- Supplier appraisal affects chain performance in dairy industry in Kenya

Extent	Frequency	Percentage
Very great extent	39	28.9
Great extent	56	41.5
Moderate extent	25	18.5
Little extent	15	11.1
Total	**135**	**100**

The study sought to determine the extent to which E- Supplier appraisal influence supply chain performance in dairy industry in Kenya, from the research findings, most of the respondents as shown by 56 (41.5%) indicated that, E- Supplier appraisal influence supply chain performance in dairy industry in Kenya, to a great extent, 39 (28.9%)of the respondents indicated to a very great extent 25 (18.5%) of the respondents indicated to a moderate extent whereas 15 (11.1%) of the respondents indicated to a little extent. This implies that, E- Supplier appraisal influences supply chain performance in dairy industry in Kenya to a great extent.

Table 9: Statements relating to Evaluation of supplier performance

Statements	not at all	little extent	moderate extent	great extent	Very great extent	Mean	Std deviation
E-electronic supplier appraisal can assist firms in restructuring of supplier network	3	4	8	90	30	4.04	0.27
Our company uses uniform supplier appraisal criteria on all the suppliers of materials.	5	3	4	79	44	4.14	0.25
Electronic supplier appraisal enables our company to engage suppliers who are consistent i.e. in quality and time in supply of materials.	3	3	7	86	36	4.10	0.26
E-procurement allows our company to enjoy a faster and accurate supplier evaluation.	2	2	6	83	42	4.19	0.26
Electronic supplier appraisal allow our company to engage committed suppliers	4	1	6	94	30	4.07	0.29

The study sought to reveal the extent to which respondents agreed with the above statements relating to E-Supplier appraisal on supply chain performance. from the research findings, electronic supplier appraisal can assist a firm in restructuring of supplier network as supported by a mean of 4.04, on whether the company uses uniform supplier appraisal criteria on all the suppliers of materials, respondent by a mean of 4.14 agreed whereas a mean of 4.10 supported the fact that the company is able to engage suppliers who are consistent in supply of materials. A majority of the respondents agreed that; e-procurement allows the company to enjoy a faster and accurate supplier appraisal on all suppliers by a mean of 4.19. On the aspect that through electronic supplier appraisal, our company is able to engage committed suppliers, respondent agreed with a mean of 4.07. The analysis also revealed a low standard deviation which implies that respondent were of similar opinion. From the above findings it clears that supplier appraisal has a key role

in supply chain performance. The findings are in line with the findings by Stone and Love (2007) that supplier relationships are critical to the success of the strategic goals of a company.

Regression Analysis

Table 10: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.910	0.828	0.787	.223

Predictors: (constants), ERP, Electronic order processing, information sharing and E-supplier apppraisal. Dependent varaiable; supply chain performance.

Table 10 shows that the cofficient of determination that is the percentage variation detrmination in the dependent variable is supported by the variation in independent variables. R square is 0.828 which implies that varaiance in supply chain performance can be explained by ; ERP, Electronic order processing, information sharing and E-supplier apppraisal . as shown in table 4.15, Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the above table the value of adjusted R squared was 0.787 an indication that there was variation of 78.7 percent on supply chain performance in diary sector. This shows that 78.7 percent changes in supply chain performance in diary sector in Kenya could be accounted to ERP, Electronic order processing, information sharing and E-supplier apppraisal. R is the correlation coefficient which shows the relationship between the study variables, from the findings shown in the table above is notable that there extists strong positive relationship between the study variables as shown by 0.910. The study used Analysis of Variance (ANOVA) to check how well the model fits the data and the results were presented on table 4.16 as shown

Table 11: Analysis of Variance

Model		Sum of Squares	d.f.	Mean Square	F	Sig.
1	Regression	3.788	4	.947	3.026	.001[b]
	Residual	40.69	130	.313		
	Total	44.478	134			

`Critical value =1.997

From the ANOVA statics, the study established the regression model had a significance level of 0.01% which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance was less than 5%. F (3.026) statistic is the regression mean divided by the residue mean .the significant value shown by 0.001 is smaller than estimated value of 0.05 which implies that the data was significant for making conclusion that is the predictors variable; ERP, Electronic order processing, information sharing and E-supplier apppraisal explains the variation in the dependent variable that is supply chain performance.

From the data in table 12 the established regression equation was

$$\mathbf{Y = 1.543 + 0.371X_1 + 0.421X_2 + 0.406\ X_3 + 0.296\ X_4}$$

$\mathbf{X_1}$ is Electronic Resource Planning (ERP), $_{X2}$ is E-order Processing, $\mathbf{X_3}$ is Information sharing $_{X4}$ is E-supplier appraisal .from the above linear regression model, all independent variables have positive coefficient. This shows that there is a positive relationship between dependent variable; supply chain performance and independent variables; ERP, E-order Processing, information sharing and E- supplier appraisal.

Table 12: Regression Coefficients results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.543	1.033		1.494	0.004
	ERP	0.371	0.118	0.293	3.144	0.003
	E-order Processing	0.421	0.107	0.327	3.935	0.001
	Information Sharing	0.406	0.126	0.316	3.222	0.002
	E-Supplier appraisal	0.296	0.123	0.231	2.407	0.000

Dependent Variables: supply chain performance

From the above regression equation it was revealed that holding ERP, Electronic order processing, information sharing and E-supplier apppraisal to a constant zero, the supply chain performance would be at 1.543, a unit increase in ERP would lead to an increase in supply chain performance by a factors of 0.371, a unit increase in E-order proecessing would lead to increase supply chain performance by factors of 0.421, a unit increase in information Sharing would lead to decrease an in supply chain performance by a factor of 0.406, and a unit increase in E-supplier appraisal would lead to an increase in supply chain performance by a factors of 0.296 and . The t statistics determines the relativity of each predictor in the model. This is taking t as being 0.05 and below. The most significant variable was E-supplier appraisal with significant value of 0.000, E-order processing (0.001), information sharing (0.002) and ERP (0.003). All the variables were significant as their significant value was less than ($p<0.05$).

Correlation Statistics

The study applied Pearson product moment correlation coefficient which is a measure of the strength of liner association between two variables. It was used to measure the degree of association between variables under consideration. The coefficient ranges from -1 to +1.where there is a negative value, there is negative correlation and positive value implies a positive correlation. Where Pearson coefficient is less than 0.3, the correlation is weak and 0.5 implies a strong correlation.

Table 12 Correlation coefficient

	supply chain performance	ERP	E-order Processing	Information Sharing	E-Supplier appraisal
supply chain performance	1				
ERP	.880	1			
E-order Processing	.667	.084	1		
Information Sharing	.701	.236	.061	1	
E-Supplier appraisal	.834	.094	.210	.120	1

From the finding in the table above, the study found that there was strong correlation coefficient between Supply chain performance and ERP, as shown by correlation factor of 0.880, this strong relationship was found to be statistically significant, the study found strong positive correlation between Supply chain performance and E-order Processing as shown by correlation coefficient of 0.667, The study also found strong positive correlation between Supply chain performance and Information Sharing as shown by correlation coefficient of 0.701. Finally the study found a strong positive correlation between Supply chain performance and E-Supplier appraisal as shown by correlation coefficient of 0.834.

CONCLUSIONS

The study analysis showed that e-procurement has a very strong influence on supply chain performance. The study also found out that ERP, E-order processing, information sharing and E- supplier appraisal are positively correlated to supply chain performance. The independent variables: ERP, E-order processing, information sharing and E-supplier appraisal have a strong and positive relationship with the dependent variable; supply chain performance. As shown by the correlation matrix, independent variables: ERP, E-order processing, information sharing and E-supplier appraisal, are important determinant of supply chain performance. From the regression model shown in the study, the findings are that the value of adjusted R squared was 0.787 an indication that there was variation of 78.7 percent on supply chain performance which is explained with the variables considered in the model; ERP , E-order processing , information sharing, and E- supplier appraisal. Considering the level of R squared, it is clear that 78.7 percent changes in supply chain performance in diary sector in Kenya could be accounted to ERP, E-order processing,

information sharing and E-supplier appraisal which implies that these variables are significant and need to be considered any time an organization is targeting to improve performance.

RECOMMENDATIONS

Based on the findings the study came up with the following recommendations as far as influence of e-procurement on supply chain in dairy industry is concerned. The study recommends that the company should embrace e-procurement by implement ERP so as to improve supply chain performance.

Further, the study recommends that the company should implement e-procurement systems that enhance better supply chain performance through improved order processing. This is by ensuring customer satisfaction, reduction in lead times and waste reduction. In order to achieve this company should ensure use of electronic order processing, implementation of a system that enhances waste reduction, implementation of a system that enhance timely placement of order and also use of a system that will allow faster order processing..

The study recommend use of IT infrastructure that enable linking with suppliers and partners, use of system that enable sensitivity in capturing and transmission of point of sale data, use of EDI in sharing of information on market, ensuring suppliers access inventory data of their customers and implementing systems that speeds up time taken for new products to get to the market.

Finally the study recommends that to enhance the performance of supply chain ,the management should take into consideration the study variables since the finding shows that there is a relationship between ERP, Electronic order processing, information sharing and supplier appraisal and supply chain performance.

REFERENCES

Aberdeen group (2005), *«Best Practices in E-Procurement: Reducing Costs and Increasing Value through Online Buying»*, Aberdeen Group, pp. 6-7.

Afshin afsharipour (2005), *e-procurement in automotive supply chain of Iran*, Master Thesis, Lulea University of technology

Albrecht, C.C., Dean, D.L. & Hansen, J.V. (2005). Marketplace and technology standards for B2B e-commerce: Progress, challenges, and the state of the art, *Information & Management*. Marriott School of Management and Rollins Center for e-business Brigham Young University, USA.

Bakos, J.Y. (1991). A strategic analysis of electronic marketplaces, *MIS Quarterly*, 15(3).

Barla, D. (2003). Assessment of the Procurement System in Kenya, downloaded from http//:www.ppoa.co.ke assessment done by Rambøll Management A/S, Final version.

Barratt, M. & Rosdahl, K. (2002). Exploring business-to-business market sites, *European Journal of Purchasing and Supply Management*, vol. 11, no. 3, pp. 11-12. Bartezzaghi, E. and Ronchi, S., (2004). A portfolio approach in the e-purchasing materials. *Journal of Purchasing and Supply* Management, vol. 10, no. 3, pp. 127-129.

Bendoly, E., Scoenherr, T., 2005. ERP systems and implementation process benefits: Implications for B2B e-procurement. *International Journal of Operations& Production Management* 25 (4), pp.304-319

Boer L, Harink J, Heijboer G (2001) *A model for assessing the impact of electronic procurement forms.* In 10th International Annual IPSERA Conference, pp 119–130

Borg and Gall(1989), *Statistics, 2nd* Edition,Gall's Publication, Goteborg

Braglia, S. and Petroni, R. (2000).Supply chain performance benchmarking study reveals keys to supply chain excellence. Logistics Information Management 8 (2).

Cagliano, R., Caniato, F. & Spina, G. (2003). E-business strategy: How companies are shaping their supply chain through the Internet, *International Journal of Operations & Production Management*, 23(10).

Carter P, Carter J, Monczka R, Slaight T, Swan A (2000) *The future of purchasing and supply: a ten year forecast*. J Supply Chain Manage 36(1):14–26

Çebi. S. and Bayraktar, A. (2003). trategically managed buyer-supplier relationships and performance outcomes, *Journal of Operations Management* (pg 44.53)

Chin, W. C., & Todd, P. A. (1995). On the use, usefulness and ease of use of structural equation modeling in MIS research: a note of caution. MIS Quarterly, 19(2), 237–246.

Chopra S, Meindl P, Kalra D (2010) *Supply chain management*. Pearson Education, Noida

Chun Wang-Zheng Wang (2006). *The impact of Internet on service quality in the banking sector*, Lulea University. Master.

Clark, T. H. and Lee, H. G., "Performance, Interdependence, and Coordination in Business to- Business Electronic Commerce and Supply-Chain Management," *Information Technology and Management*, 1, 2000, 85-105.

Croom, S. & Johnson, R. (2003). E-service: Enhancing internal customer service through e-procurement, *International Journal of Service Industry Management*, 14(5).

Croom, S. (2000). The impact of web-based procurement on the management of operating resources supply, *Journal of Supply Chain Management*, 36(1).

Daugherty, P., R. Germain, and C. Droge. 1995. Predicting EDI technology adoption in logistics management: The influence influence of context and structure. *Logistics and Transportation Review* 31: 309-324

David Caffey (2009). *E-Business and E-Commerce Management*.

Davila, A., M. Gupta, and R. Palmer. 2003.Moving procurement systems to the internet: The adoption and use of e-procurement technology models. *European Management Journal 21:* 11-23.

Davis, F. D., Bagozzi, R. P., &Warshaw, P.R. (1989). User acceptance of computer technology: A comparison of two theoretical model. Management Science, 35(8), 982-1003.

De Boer, L., Harink, J. & Heijboer G. (2002). A conceptual model for assessing the impact of electronic procurement, *European Journal of Purchasing & Supply Management*, 8(1).

De Toni and Nassimbeni (2000) The contribution of performance measurement to the expansion of third party logistics alliances in the supply chain. International Journal of Operations &Production Management 21 (1/2

Dooley, K. and S. Purchase. 2006. Factors influencing e-procurement usage. *Journal of Public Procurement* 6: 28-45.

Eisenhardt, K. M. (1989) *Agency Theory: An Assessment and Review*. Academy of Management Review, 14(1)**,** 57-74.

Eng, T.Y. (2004). The role of e-marketplaces in supply chain management, *Industrial Marketing Management*, 33(2).

Evans, P. & Wruster, T.S. (2001). Blown to Bits, *How the new economics of information transforms strategy*, Harvard Business School Press, Boston from http://plato.stanford.edu/entries/game-theory

Giunipero, C. L., Denslow, D., & Eltantawy, R. (2005). Purchasing/supply chain management flexibility: Moving to an entrepreneurial skill set. *Industrial Marketing Management, 34*, 602-613.

Giunipero, L. and C. Sawchuck. 2002. *E-purchasing plus: Changing the way corporations buy*,JGS Enterprise

Goldratt, E.M. (1990a), *Theory of Constraints,* North River Press, Croton-on-Hudson, NY.

Goldratt, E.M. and Cox, J. (1992), *The Goal: A Process of Ongoing Improvement*, North River Press, Croton-on-Hudson, NY.

Gordon, S. (2008) Advances in e-procurement: A focus on the product/buying situation, Management Services, 48(6).

Gunasekaran, A., Lai, K.-h., & Cheng, T. E. (2008).Responsive supply chain: A competitive strategy in anetworked economy. *The international journal of management science*,549 564.

Gunasekaran, A., Patel, C., Tirtiroglu, E. (2001). Performance measure and metrics in a supply chain environment. *International Journal of Operations & Production Management* 21 (1/2).

Gunesakan, A.,Ngai, E.W.T., 2008, "Adoption of e-procurement in Hong Kong:An empirical research", *International Journal of Production Economics* 113 (2008), pp.159-175

Hansen A. (2005). "*E-purchasing – set for growth*?" Digital Ship.

Heywood J. B., (2002). *e-Procurement: Managing successful e-procurement implementation, Financial Times* - Prentice Hall, Harlow.

Hill, C. W. L. & Jones, T. M. (1992) *agency theory*. *Journal of Management Studies*,29 (2)**,** 131-154.

Hoboken, NJ: Wiley-Blackwell Hugos, M. (2003). *Essentials of Supply Chain Management*. New Jersey: John Wiley & Sons.

Hunja, R. R. (2003). Obstacles to public procurement reform in developing countries. *Public Procurement: The Continuing Revolution, Kluwer Law International*.

Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. M. (1997). Personal computing acceptance factors in small firms: A structural equation model. MIS Quarterly, 21(3), 279-305

Jones, T. M. (1995) *Instrumental Stakeholder Theory: A Synthesis of Ethics and Economics. Academy of Management Review*, 20(2)**,** 404-437.

Jose garrido-saminiego et al (2010). "Assessing the impact of e-procurement on the structure of buying center." *International Journal Of information Management*.

Judith Gebauer & Arie Segav (2001). *"Assessing Internet-Based procurement to Support virtual enterprise."*

Judith Gebauer-Carrie Beam and Arie Segev (1998). *Impact of the Internet on Procurement*

Kassim.A (2012) Unpublished. Electronic procurement and organizational performance among commercial states corporations. Kenya Dairy Board report (2006)

Kaplan, R. & Norton D. (1996). *Balanced score card: Translating strategy into action*. Harvard Business School Press

Kim J. and Shunk D. (2003). *Matching indirect procurement process with different B2B e-procurementsystems*, Computers in Industry Vol. 53. 153-164.

Kinya R (2013) Unpublished ,E-procurement Implementation and Supply Chain Integration among Large Scale Manufacturing Firms in Nairobi Kenya.

Knudsen, D. 2003. 'Aligning corporate strategy, procurement strategy and e-procurement tools'. *International Journal of Physical Distribution and Logistics Management*, 33(8): 720-734

Kothari, C.R. (2003). *Research Methodology*. New Delhi: Willy Eastern Limited. India

Lambert, D. and M. Cooper. 2000. *Issues in supply chain management. Industrial Marketing Management 29:* 65-83.

Lau, H., & Lee, W. (2000). On a responsiveSupplyChain Information System. *International journal of physical Distribution& Logistics Management*, 598-610.12]

Lee, H.L., & Whang, S. (2001). *E-Business and Supply Chain Integration, Standford Global Supply Chain Management Forum*, Stanford University

Lee, H.L., Padmanabhan, V., & Whang, S. (1997). *Information distortion in a supply chain: The bullwhip*, *Management Science*, 43(4).

Lejeune, M. A., & Yakova, N. (2005). On characterizing the 4 C's in supply chain management. *Journal of Operational Management*, 23, 81-100.

Lidija Pulevska-Ivanovska (2004). "E-procurement as an instrument for hotel supply chain management." *Journal of tourism.*

Lysons, K. (2002). *Purchasing and Supply Chain Management*, (5th Ed). London Financial Times, Prentice Hall

Malcom H.Morrison (2009). *"An opportunity for cost saving, greater efficiencies."*

Maskel , M .(2001). Internet based electronic markets, Electronic Markets 9(3).

Minahan T.A (2001)"Wanted; rapid deployment of ROI for e-procurement"available at www.aberden.com.

Mohindroo A (2003)*"Deriving value from an extended enterprise with Oracle application server integration".*

Moon, M.J., 2005, "E-procurement management in state governments: Diffusion of eprocurement practices and its determinants." *Journal of Public Procurement* 5 (1), pp. 54-72

Mose, P.N (2012). An Assessment of the Extent Of Compliance With Public Procurement And Disposal Act 2005 In Level 5 Hospitals In Kenya: A Study Of Kisii Level 5 Hospital. Unpublished MBA Report, Egerton University, Kenya

Mugenda, O.M. & Mugenda A. (1999). *Research Methodology: Quantitative Approaches*, Acts Place, Nairobi.

Narasimhan, R. and S. Kim. 2002. Effect of supply chain integration on the relationship between diversification and performance: Evidence from Japanese and Korean ñrms. *Journal of Operations Management* 20: 303-323.

Narasimhan, R., & Das, A. (2001). The impact of purchasing integration practices on manufacturing performance, *Journal of Operations Management*. 19(5).

Neef, D. (2001). *E-procurement: From Strategy to Implementation*. Upper Saddle River, NJ: Prentice-Hall/ Financial Times.

Nelson D, Moody P, & Stegner J. (2001). *The purchasing machine: How the top ten companies use best practices to manage their supply chains*, New York, NY: Free Press

New KCC annual Report(2013/2014)

Odongo.G(2012) Unpublished. Adoption and Risk of Electronic Procurement among Automated teller machines solutions providers in Kenya

Presuti W (2003)*"Supply Management and e-procurement: creating value added in the supply chain"* Industrial Marketing Vol. 32 pp 219-27.

Puschmann, T. and Alt, R., 2005. *Successful use of e-procurement in supply chains*. *Supply Chain Management*: An International Journal, vol. 10, no. 2, pp. 122-133.

Ramasubramanian D. (2005). *E-procurement making waves offshore*. Offshore Magazine.

Rankin J., Chen Y. and Christian A. (2006). *E-procurement in the Atlantic Canadian AEC industry*. ITcon Vol. 11, Pp. 75-87

Robinson Jr., E.P., Sahin, F., Gao, L.-L., 2005, "*The impact of e-replenishment strategy on make-to-order supply chain performance."* Decision Sciences 36 (1), pp. 33-64

Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press

Roylance, W. (2008) Supply management and e-procurement: *journal Creating value added in the supply chain*, Industrial Marketing Management 32(3)

Schmitz and Platts (2003). Measuring the Performance of Suppliers: An Analysis of Evaluation Processes, The *Journal of Supply Chain Management* 52.66

Sekaran, U. (2010). *Research methods for business*: A skill building approach, (4th Ed).

Selnes, F. & Sallis, J. (2003). Promoting relationship learning,*Journal of Marketing*,67(3).

Sheel Print-N-Pack. Noida. India. Segev, A., Gebauer, J. & Farber, F. (1999). Internet based electronic markets, *Electronic Markets* 9(3).

Simatupang, T. M, & Sridharan, R. (2004). A benchmarking scheme for supply chain collaboration. *Benchmarking: An International Journal*, 11(1), 9-30.

Slack, N., Chambers, S., Harland, C., Harrison, A., Johnston, R. (1995).Operations Management. Pitman Publishing, London Smallholders development project

Stank, T., Kotzab, H. & Grieger, M. (2001). Electronic marketplaces and supply chain relationships, Industrial Marketing Management, 32(3).

Stone, G. and Love, S. (2007). Benefits and barriers of electronic marketplace participation: An SME perspective, *Journal of Enterprise Information Management* 17(4)

Subramaniam, C. and Shaw, M.J. 2002. 'A Study of the Value and Impact of B2B E-commerce: The Case of Web-Based Procurement'. *International Journal of Electronic Commerce*, 6(4): 19-40.

Swartz, D., & Orgill, K. (2001). *Higher Education ERP:* Lesson Learned. 20-27.

Tan, K., V. Kannan, R. Handfield, and S. Ghosh. 1999. Supply chain management : An empirical study of its impact on performance. *International Journal of Operations and Production Management* 10:1034-1052

Tan, K.C. (2001). A framework of supply chain management literature, European *Journal of Purchasing and Supply Management*, 7(1).

Transparency International. (2006). *Handbook for Curbing Corruption in Public Procurement*. Transparency International, Berlin

Turban, E., D. King, J. Lee, M. Warkentin, and H. Chung. 2002. *Electronic commerce2002: A managerial perspective*. New York: Pearson.

Van de Ven, A. H. & Poole, M. S. (1995) *Explaining development and change in organizations. Academy of Management Review*, 20(3)**,** 510-540.

Wangui.m.(2013) Unpublished .The effect of E-procurement on supply chain management at Teachers' service commission

Willisand Huston (1989). A survey of procurement strategy development in industrial companies, International *Journal of Production Economics* 56-57(1).

Wittig, W.A. (1998). *Report of the Conference on Public Procurement Reform Conference in Africa,Côte d'Ivoire,* 30 November-4 December 1998, International Trade Centre, Geneva.

Yen, B.P.-C. and Ng, E.O.S. 2003. 'The impact of electronic commerce on procurement'. *Journal of Organizational Computing and Electronic Commerce*, 13(3-4): 167-189.

YÜRÜYEN, U. M. (2002). *"E-commerce Applications in Liner Shipping."*

Yvonne Darlington and Dorothy Scott (2002). *Qualitative research in practice Stories from the field*.

Zeng, A. and B. Pathak. 2003. Achieving information integration in supply chain management through B2B e-hubs: Concepts and *analyses. Industrial Management and Data Systems* 103: 657- 665