

**ELECTRONIC PROCUREMENT IMPLEMENTATION AND
SUPPLY CHAIN PERFORMANCE OF DAIRY FIRMS IN KENYA**

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DECLARATION

I declare that this research project is my original work and has never been submitted to any other University for assessment or award of a degree.

Signature..... Date.....

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REG: D61/78605/2015

This project has been submitted with my authority as the university supervisor.

Signature..... Date

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DEDICATION

This work is dedicated to the entire Onjala family and my friends.

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I wish to recognize the guidance I received from Mr. Michael Chirchir who was my supervisor as I conducted this study. I also acknowledge my colleagues in the MBA class for their ideas, assistance, stimulating feedback and advice. To all respondents your honest responses and candid feedback were very helpful for accomplishment of this research project. I also acknowledge the University of Nairobi, Department of Management Science who are doing everything to ensure that we get the right skills for our careers. And to all those who supported me in one way or another, thank you very much and, may God bless you.

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ABBREVIATIONS AND ACRONYMS

B2B	-	Business to Business
FAO	-	Food and Agriculture Organization
IT	-	Information Technology
KCC	-	Kenya Cooperative Creameries
KDB	-	Kenya Dairy Board
NKCC	-	New Kenya Cooperative Creameries
NHIF	-	National Hospital Insurance Fund
SCM	-	Supply Chain Management
SPSS	-	Statistical Package for the Social Sciences
TAM	-	Technology Acceptance Model
UHT	-	Ultra High Temperature

ABSTRACT

In today's dynamic and radical global business competition scenario, web based technology is of great importance. Due to increased globalization, deregulation and digitalization, information technology has become extremely important and businesses are now adopting e-commerce such as electronic procurement. Over the past decade in Kenya dairy processing firms have been using information and communication technology to enhance the procurement functions. Dairy industry in Kenya is undergoing stiff competition. This has seen them diversify their products and increase their customers' network. Despite this, they are still experiencing slow adoption of e-procurement. The main objective of the study was to establish the relationship between electronic procurement implementation and supply chain performance of dairy firms in Kenya. The study will be anchored on relevant theories on e-procurement which are: Technology Acceptance Model, Supply Chain Network Theory and Systems Theory. This study used descriptive research design. The study population was the dairy firms in Kenya. Questionnaire was used to collect data. Data collected was analyzed quantitatively. The findings indicated that the firms had implemented E-procurement to a moderate extent. The procurement processes include: E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing. The respondents indicated that E-reverse auction contributes to Supply Chain performance to a large percentage ($M=3.04$, $SD=0.031$). The challenges faced by dairy firms include: fear of security threats and confidentiality of information ($M=3.92$, $SD=0.854$), inadequate technical expertise and staff in competencies ($M=3.80$, $SD=1.004$). From the above findings the following conclusions were made. E-procurement has been implemented to varying extents by the dairy processing firms. The aggregate E-procurement implementation level for all the dairy firms is moderate indicating that some of the firms are still using the traditional procurement methods to a moderate extent. The study concludes that the challenges of E-procurement implementation among dairy firms that were established from the study are: fear of security threats and confidentiality of information, inadequate technical expertise and staff in competencies. Security matters on any IT platform are a concern for all. Despite this, investment in the necessary IT security features in any electronic system will provide substantial deterrent from any unauthorized access or manipulation. The dairy firms should therefore invest in security systems within their entire IT platform that will give them the ability to minimize their exposure to such risks. The limitations of the study include the use of questionnaire which might suffer the problem of social desirability and study concentrated on only one industry thus generalization of results was limited.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

In today's dynamic and radical global business competition scenario, web based technology is of great importance. Due to increased globalization, deregulation and digitalization, information technology has become extremely important and businesses are now adopting e-commerce such as electronic procurement (Lee, Ni & Koc, 2001). Electronic procurement involves adoption and use of technology to procurement practices with an aim to improve efficiency and management. The business environment is constantly changing meaning that companies are need to flexible so as to continue being profitable so as to meet the expectations of the stakeholders. Procurement is a vital function in the organization as it affects the organizational operations and financial performance since it cuts across all departments of an organization (Wachira, 2013). According to Musau (2015) electronic procurement has been promoted as one of the ways of improving the effectiveness and efficiency of procurement. The dairy industry in Kenya has evolved due to the emergence of new players, new products and new customers and the ever changing economic environment with factors such as cost of doing business, borrowing and lending coming into play. These factors can be monitored by ensuring that there is in place an efficient and effective procurement system.

According to Presutti (2013) electronic procurement is an information technology based purchasing process in the supply chain network. E-procurement system should be compatible with other information infrastructures so as to become connected with other business enterprises (Vaast&Walsham, 2014). The use of information technology in

electronic procurement is an innovative strategy to improve supply chain performance (Mishra & Agarwal, 2014). Implementation of electronic procurement system leads to effective operations and accountability in the supply chain. It can therefore be argued that e-procurement is an e-business application that contributes to supply chain performance. Due to increased competition, e-procurement plays a pivotal role in improving procurement performance.

In Kenya we have the Public Procurement and Asset Disposal Act (2015) which set the standards of procurement practices. Organizations are generally either public or private organizations thus procurement can be divided into either Public procurement or Private procurement (Wachira 2013). Public procurement is governed by government legislations while private procurement cannot be strictly governed by government legislations. Irrespective of the category procurement faces challenges such as corruption, waste and integrity issues (Nyanjala, 2016).

1.1.1 Electronic Procurement

Procurement involves identifying, analyzing and finding ways of availing goods and services needed by an organization (Eadie, Perera, Heaney & Carlisle, 2007). The means can be through leasing, outsourcing, borrowing or pillage depending on which one is optimal to an organization. Chepkemoi(2014) indicated that electronic procurement refers to purchasing of goods and services by various business enterprises via internet technology such as enterprise resource planning. It is seen as the solution to challenges associated with traditional procurement practices. The advancement in information and

communications technology has led to online business transactions as the preferred mode of conducting business (Musau, 2015).

E-procurement has become a popular way of doing business because of benefits such as cost of supply reduction, reduction of lead time and increased levels of transparency (Bof&Previtali, 2010). Adoption of electronic procurement has resulted to increased profitability, ease of control and improved effectiveness and efficiency in the procurement process (Khanapuri, Nayak, Sharma & Soni, 2011). Due to the benefits associated with E-procurement, many organizations both private and public are using e-procurement systems

1.1.2 Supply Chain Performance

A supply chain is composed of linked organizations which are independent but work together in ensuring an efficient flow of goods and services from the suppliers to the buyers (Dale & Cooper, 2014). Key elements to a supply chain function are processes and people. SCM endeavors to manage processes and actors within the supply chain in fulfilling customer requirements.

Supply chain management is the management of all business processes and activities that involves manufacturing, procuring of raw materials and distribution management of final goods. SCM manages materials and information flow from suppliers to producers to distributors and customers (Waithaka, 2015). It involves providing the products at the right time, place and cost to clients. In order to optimize supply chain, certain activities must be streamlined, for example constant liaison among suppliers to eliminate barriers; maintaining the right mix of factories and warehouses; strategic sourcing to minimize cost; use of just-in-time techniques; vehicle routing analysis; location allocation;

optimization of traditional logistics and dynamic programming(Gaucher & Coffey, 2014).

Supply chain performance is ability of an organization to lower the costs of logistics by delivering the products at the right place and at the right time (Zhang &Okoroafo, 2015).

Supply chain performance is a competitive strategy that enhances productivity and profitability of an organization. It affects the short term, long term and operational planning and control (Nyanjala, 2016). The main goal of supply chain management is fulfillment of customer requirements through efficiently enhancing distribution, labour and inventory. According to Stewart (2012) supply chain performance was measured by using the following metrics: procurement cost, lead times, procurement quality, competitiveness, inventory and transparency.

1.1.3 Dairy Firms in Kenya

Kenya's dairy industry is an important sector not only economically but also for its nutritional role as well as providing employment to many people including farmers, processors and milk hawkers among others (Ndinda, 2013). Farmers, milk hawkers and processors make money by selling the dairy products. The processors also hire people to work in those firms thus creating employment opportunities in the country. Agriculture contributes 30% of Gross Domestic Product of which 10% is contributed by the livestock sector (FAO, 2011). The consumers also benefit nutritionally by consuming the dairy products which are contain important nutrients that are needed to keep the body healthy.

Kenyan dairy industry dates back to the early 1900s when white settlers introduced dairy cattle in Kenya. Only whites were allowed to practice dairy farming until 1956 when Africans were allowed (Ndinda, 2013). Until 1992 the sector was under monopoly by KCC (Mwangi, 2005). Its liberalization has led to various challenges such as emergence of informal sector and private players in the milk industry (Ndinda, 2013).

The industry is regulated by Kenya Dairy Board. The main duties are to regulate, license, control and develop the dairy industry in Kenya (KDB, 2017). According to KDB (2017), there were 42 licensed milk processing firms in Kenya as at 31st August 2017. The main dominators of the industry are Brookside Dairy Ltd and New Kenya Cooperative Creameries (NKCC). These milk processors produce a wide range of products namely fresh milk, ice cream, yoghurt, mala, powder milk, cheese, ghee, UHT and butter.

1.2 Research Problem

Electronic procurement is one of the procurement reforms that have promoted open procurement through increased transparency and accountability in the procurement process. Technology has become very important in service and processing industry which has been used as a competitive advantage globally. Technology has been adopted by both the public and private institutions. In a bid to fulfill customer demands, companies are finding it necessary to undertake technological innovation as it is cost effective. Companies are now shifting from traditional way of doing business to e-commerce such as electronic procurement and electronic supply chain (Hamisi, 2010). Over the past decade in Kenya dairy processing firms have been using information and communication technology to enhance the procurement functions. According to Chepkemoi (2014)

procurement and stores department is always considered the most important department to every organization because of its contribution to organizations efficiency and effectiveness. Most companies continue to lose millions of shillings and time in purchasing various products. This has forced them to opt to e-procurement in order to cut off on cost among others.

Dairy industry in Kenya is undergoing stiff competition. This has seen them diversify their products and increase their customers' network. Despite this, they are still experiencing slow adoption of e-procurement. 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 to poor performance in the dairy supply chain. The dairy sector enjoys less regulation just like many monopolies therefore they enjoy flexibility in their business operations (Kiragu, 2013). Dairy processing firms transact with the same suppliers over and over therefore paying less attention on effective procurement systems.

Several studies have been undertaken by various researchers on e-procurement implementation. Bowonder, *et al* (2015), undertook a study on application of information and communication technology in the dairy industry in Amul, India and concluded that challenges are abound in the conceptualization in the implementation of electronic procurement because of the complexity of data architecture in the dairy sector. Tatoglu *et al* (2016) did a study in Europe seeking to establish how information systems used in supply chain affects operational performance of small and medium enterprises. The findings indicated that information systems related to supply chain management positively influence operational performance. Acar (2017) further did a study on

relationships among Enterprise Resource Planning, supply chain orientation and operational performance using structural equation modeling where the results revealed that supply chain orientation has significant and positive effects on operation performance, whereas Enterprise Resource Planning practices do not.

Locally, Musau (2015) focused on state corporations but his study was specific to how inventory optimization challenges influenced e-procurement performance in state corporations. The findings showed that strategies for inventory optimization are positively related to performance of electronic procurement in public corporations. Omondi and Namusonge (2015) did a study on best practices in the retail industry and established that e-procurement is one of the best practices. Murathi (2016) did a study on determining the success on user adoption of electronic procurement in Kenyan Government Ministries and found out that there was success on user adoption of e-procurement in Kenyan Government Ministries.

Although various studies have been done on e-procurement and e-procurement implementation, none of the studies focused on e-procurement implementation and supply chain performance of dairy firms in Kenya. This research therefore sought to address this knowledge gap by answering the research questions: to what extent do dairy firms in Kenya adopt and implement e-procurement? What is the relationship between electronic procurement implementation and supply chain performance of dairy firms in Kenya? What are the challenges faced by dairy firms in Kenya when implementing electronic procurement?

1.3 Research Objectives

1.3.1 General Objective

The main objective of the study was to establish the relationship between electronic procurement implementation and supply chain performance of dairy firms in Kenya.

1.3.2 Specific Objectives

Specifically, the study sought:

- i. To establish the extent to which e-procurement is adopted and implemented by dairy firms in Kenya.
- ii. To determine the relationship between e-procurement implementation and supply chain performance of dairy firms in Kenya.
- iii. To establish the challenges faced by dairy firms in Kenya when implementing e-procurement.

1.4 Value of the Study

The study will be of value to members in the dairy industry as it will help them to improve in future by identifying gaps in their procurement system, identifying areas of improvement and employing the right procurement practices to increase effectiveness and efficiency.

The study will be of value to the policymakers in the dairy industry in drafting and improving policies governing the dairy sector in Kenya. The findings and recommendations generated from the study may be of invaluable input to the stakeholders of dairy industry in general both in Kenya and elsewhere both public and private sector institutions.

The findings will also benefit academicians and scholars in the area of supply chain and procurement; it can be used for further studies by academia. The findings will create a research gap which other researchers can study and come up with informed findings.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers relevant literature on e-procurement implementation and supply chain performance. Empirical review of literature is also carried out in line with the research objectives. The chapter reviews theories relevant to the study as well as the empirical review of electronic procurement implementation and supply chain performance.

2.2 Theoretical Literature Review

The study was guided by relevant theories on e-procurement which are: Technology Acceptance Model, Institutional Theory and Resource Based view.

2.2.1 Technology Acceptance Model

There has been an increase in procurement cost and companies are seeking to adjust their budgets accordingly. Organizations are facing serious pressure of providing quality products and services despite resource limitation. Information and communication technologies have been adopted by many organizations both public and private organizations which has led to increased performance through effective communication, knowledge sharing, information access and innovation (Dewett& Jones, 2001).

Technology Acceptance Model (TAM) was propounded and validated by Davis (1993) in order to explain the antecedents that influence the adoption and user acceptance of new technological innovation. Davis (1993) indicated that there are two important determinants of users' acceptance of using new technology which include perceived ease of use and perceived usefulness as explained by the design of the information system.

Administrators of organizations need to do an assessment of employees' attitude towards adoption of e-procurement so as to ensure successful implementation and reduction of resource wastage.

Successful implementation of e-procurement requires a well designed policy and process. One of the important variables which may derail successful implementation of e-procurement is users' acceptance of new information technology. Implementation of e-procurement may face resistance because it presents a change in the way they perform their procurement activities. The changes include replacement of the traditional manual procedures with procedures anchored on information and communication technology. According to Rahim (2008) one of the obstacles in implementing of electronic procurement is the users' resistance to change while acceptance is not.

2.2.2 Supply Chain Network Theory

Supply chain can be represented as a network in the form of "nodes" of independent units of business which are capable of undertaking free choices. It is a combination of connections which link organizations jointly for purposes of new product and service development. Inter firm connections symbolize the relations and contractual agreements if any. Previous empirical research into real-world networks has recognised seemingly universal network properties (Bullmore&Sporns, 2009). The purpose of supply chain network is to develop trust among the various supply chain players leading to long-term business relationships. These include 3rd party logistics, management roles in supply chain networks and buyer supplier relationships (Gunasekaran, Lai & Cheng, 2008).

According to Tang (2013) supply management should have a positive impact on the mitigation of the supply chain risks. Many researchers have posited several supply base strategies that can be used to reduce supply chain risks. These include extensive use of inspections in supplier qualification, flexible contractual agreements combined with other strategies such as buy make and buy. This helps in dividing the production process across different departments or factories in choosing multiple sourcing (Wieland, 2013), nurturing trust in supply chain network (Srinivasan, Mukherjee & Gaur, 2011), risk management in a practical manner and finding alignment on the benefits vis a vis cost incurred in managing risks, (Paik & Bagchi, 2007), risk sharing through sourcing relationships through forging close association with selected single suppliers and weakening any other relationships with multiple suppliers so as to minimize risks (Blackhurst *et al.*, 2011).

2.2.3 Systems Theory

Systems theory was propounded by Luudwig Von Bertalanffy while making contribution for a seminar in 1950s. In his arguments, Bertalanffy (1968) argued against classical modeling whose basis is mathematical analysis of the system and presented arguments that time factor affected open systems. Lowaon (2003) indicated that dynamic analysis of the systems is needed for interrogation of the open systems. Open systems theory is based on several principles and the first principle has two concerns that firms should take into considerations in regards to supply chains. The principle holds that the length of the supply chain affects the adaptability of the supply chain and hence the alteration required to survive will be impossible (Parker, 1999).

The principle number two of the open systems theory indicates that supply chains provides the prospects to contract out certain services to other firms by embracing new methods like inventory managed by vendors as a technique of rationalizing the company's operations. Thirdly, supply chains are not monumental structures but can be divided into various sub-systems. In regards to supply chains; the quantity of service, goods, knowledge/information and products transacted in the supply chain may grow. In addition, firms should come to the realization that even if supply chain and information systems are artificial assemblage and not living systems but doesn't mean that they cannot change.

Yourdon (1989) applied the four principles of open systems theory in the area of information systems and regards to e-procurement and supply chains. The universal concept of open systems theory can be applied in understanding the interactions of the components of supply chain.

2.3 E-Procurement Implementation

Electronic procurement is a form advanced online technologies. Electronic procurement is defined as the adoption and use of integrated information and communications technologysystems in the procurement process such as tendering, ordering, negotiation and post purchase evaluation. Enterprise Resource Planning refers to the use of software in making requisitions, ordering and receipt of ordered goods and services (Croom & Brandon-Jones, 2007). Collaboration is one of the crucial enablers of Enterprise Resource Planning (Knudsen, 2003). GovWin (2012) listed a number of forms of electronic

procurement applications. The applications include; E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing as general elements of electronic procurement.

E-sourcing is defined as the application of internet technology in identifying suppliers that fit a given purchasing requirement as specified in the various categories of purchases. Internet provides organizations with a platform to transact with different suppliers in a wider perspective and allow selection of suppliers based on their specific requirements. According to Shalle (2014), E-sourcing also entails obtaining bids from different suppliers via a single online portal. Firms that employ this strategy benefits from its competitive aspect where by a different suppliers bid for projects, thus the firm has to choose their favorite.

E-tendering refers to the use of web based technology in sending invoice and purchases requests to suppliers. Supplier responses are also received online as part of the e-tendering process. E-tendering is a secure platform that allows suppliers and buyers to carry out their transactions online. According to Teo (2009), electronic tendering system encompasses the entire tendering procedure from advertisement of tender requirements to contract placement. All the required documents are also electronically exchanged online

According to Smart (2010) E-reverse auctioning is real time, an online bidding process where the winner is the lowest bidder. The suppliers are given the contract by the customers who bid for them to get the business. The lowest bidder in this case is considered to be the winner. It is a strong negotiating weapon that enables several interested parties to bid and others to sell. This gives room to competition, increasing the competitiveness and improving the price at which goods and services can be sold. E-reverse auctioning involves use of internet in bidding products in real time.

E-ordering involves electronically capturing data such as requests, orders and other information directly from customers and storing in database that is central to an organization. The data is then analyzed by the relevant departments. Ingram (2016) asserts that e-order processing makes use of systems to record data of orders from the customers and stores the information in a database. The data of orders is then forwarded to the logistics or accounting department for further action. Ordering sales and purchases appears a simple and straightforward process but it is a major challenge to many buyers and suppliers (Celtino, 2016). An E-ordering system keeps order information and keeps track of inventory in a step wise manner along the procurement process. It ensures quick response to customer orders due to enhanced speed order processing and reduced transmission errors.

E-informing is a process of collecting and disseminating information concerning purchases to buyers and suppliers as well as other interested persons using web based technology (GovWin, 2012). In contrast to other forms of e-procurement discussed above, E-informing is not directly linked to contracting or ordering. According to Miles and Covin (2010) E-informing involves assembling information and distributing to and from external and internal parties using web based technology. For instance use of extranet that is easily accessible by suppliers in making available information on purchasing management is a form of e-informing.

2.4 Empirical Literature Review

Ronchi et al. (2010) concentrated on the significance of information technology on electronic procurement system. Six benefits were identified in this study and were

classified as follows; lead time opportunity cost, Order cost, opportunity cost of capital and administrative cost on which decentralization and financial performance is calculated. Organizational performance is assessed through supply-base rationalization, maverick-buying reduction, transparency and control. This classification was an attempt to establish the value of electronic procurement in firms. The study was done as a general empirical review without focusing on any specific industry as opposed to the current study which was confined to the dairy sector only.

Calipinar and Soysal (2012) analyzed e-Procurement in the health sector in Turkey. The study adopted a case study strategy. The researchers established that with little time and financial investment, saving considerable time and money can be ensured by using the proposed advice given to pharmacies working in hospitals. The study concluded that generally electronic procurement in less developed countries can be seen by academics and practitioners with e-procurement adoption by pharmacies located in Turkey. The study was based on health sector while the present study looked at the dairy sector in Kenya.

Amin (2012) conducted a study on the effects of e-procurement on organizational performance among commercial state corporations in Kenya. The study sought to find out the extent of e-procurement adoption among commercial state corporations in Kenya as well as find out how e-procurement affected performance in commercial state corporations. The sample size comprised of forty respondents who were sampling through stratified sampling technique. The results indicated that e-procurement had been adopted in commercial state corporations however certain procurement functions were

still being carried manually. The study however did not look at other firms in the private sector.

Kamarulzaman and Mohamed (2013) conducted a study on application of e-procurement technologies for selecting suppliers of agro-based small and medium enterprises in Malaysia. The study further sought to find out the extent to which small and medium enterprises were willing to increase the use of electronic application system in supplier selection. Data collection was done using an online survey where the findings indicated that security, commitment, cost, quality, efficiency, legal environment and delivery acceleration affect the extent of e-procurement adoption and application among agro based small and medium enterprises. The study however looked at the entire agro based industry while the current study narrowed down to dairy sector in Kenya.

Mose, Njihia and Magutu (2013) carried out a study to establish the factors affecting e-procurement projects success using a descriptive approach. The results indicated that most of the large scale manufacturing firms in Nairobi had implemented electronic procurement such as receipt of online submission of proposals, advertisement of tenders online and online short listing of suppliers. The study did not show a link between e-procurement implementation and supply chain performance but rather focused on the challenges in e-procurement adoption.

Nzuve (2013) conducted on a study focusing on implementation of e-procurement practices among private hospitals in Nairobi, Kenya. The study found that e-procurement had been implemented to a moderate extent by the NHIF accredited hospitals. Factor analysis was applied to identify factors that affect implementation of electronic procurement. These factors include: risk perception, end user training, existing

technology, top management support, supplier systems integration, implementation strategy and vendor support. The study focused on e-procurement practices but the current study focused on e-procurement implementation.

Sharifai, Mbaraka and Agaba (2013) conducted a study on the effects of e-procurement and performance of service organizations in Uganda. The findings indicated that there was a connection between electronic procurement and the performance of the service organizations that were selected. Descriptive research design was used in this study applying both quantitative and qualitative methods. The study found out that there was significant relationship between electronic procurement and performance of service organizations. This conclusion came because IT has been embarrassed in all spheres of life to an extent that almost everything revolves around use of information technology. This research mainly focused only on service organizations in Uganda not in Kenya.

Makali (2015) focused on the contribution of electronic procurement to procurement performance in supermarkets in Nairobi. The aim of the study was to assess the adoption of e-procurement in the supermarkets in Nairobi, to evaluate procurement performance in the supermarkets in Nairobi and to determine the contribution of e-procurement to procurement performance in supermarkets in Nairobi. Due to small number of supermarkets in Nairobi, a census survey was done. The findings in this study show the most critical practices that contribute greatly to procurement performance in supermarkets are e-tendering, e-requisitioning and e-sourcing. The study only dealt with supermarkets in Nairobi while the current study focused on the dairy processing firms in Kenya.

Mwangi and Kagiri (2016) sought to find out the relationship between e-procurement and procurement performance in hospitality industry in Kenya. This study was descriptive in nature hence used descriptive design. The study was a case of Sarova chain of hotels and adopted a descriptive research design. The study revealed that through e-tendering, compliance to policy at Sarova Chain of Hotels has improved as the hotel can quickly procure products and services from preferred suppliers and are unable to create maverick purchase. The study further revealed that e-informing influences the procurement performance of Sarova Chain of Hotels to a great extent –because electronic procurement has the potential to reduce the total cost of acquisition. The study only focused on the hospitality industry while the current study looked at the dairy industry in Kenya.

2.4.1 Summary of Literature and Gaps

The table 2.1 below indicates the summary of the empirical literature and the knowledge gap that the current study will address.

Seven studies reviewed under the empirical review both local and international are presented in the table below.

Table 2.1: Summary and Knowledge Gaps

Author(s)	Focus of the Study	Methodology	Major findings	Knowledge gaps
Ronchi et al. (2010)	The value of an information technology on electronic procurement system	Delphi methodology was applied	The study determined six major benefits emanating from e-procurement adoption. A classification type was also prepared	Data was collected from companies without e-procurement system in place but the current study looks at firms that have implemented e-procurement.
Amin (2012)	Effects of e-procurement on organizational performance in commercial state corporations	Descriptive research design was adopted	Although e-procurement had been adopted in commercial state corporations, manual functions still existed	The study however did not look at other firms in the private sector.
Calipinar and Soysal (2012)	E-Procurement in the health sector in Turkey	A case study research design. Semi structured interviews and nonparticipant observations	Flow of materials and information can be improved by use of technology from the perspective of e-procurement.	The study was Turkey based and only used a case study of pharmaceuticals which is in a different sector with the dairy processing firms
Kamarulzaman and Mohamed (2013)	E-procurement technologies in agro-based small and medium enterprises	Data collection was done using an online survey. factor analysis and logistic regression analysis were carried	Security, commitment, cost, quality, efficiency, legal environment and delivery acceleration affect e-procurement implementation	The study looked at the entire agro based industry while the current study narrowed down to dairy sector in Kenya

		out		
Mose, Njihia and Magutu (2013)	Factors that influence the success of e-procurement projects in large scale manufacturing firms in Nairobi	Descriptive survey approach	The study found out that a higher percentage of large scale manufacturers based in Nairobi had implemented e-tendering, e-sourcing and online short listing of suppliers	The study did not show a link between e-procurement implementation and supply chain performance but rather focused on the challenges in e-procurement adoption.
Nzuve (2013)	E-procurement implementation practices among private hospitals in Nairobi, Kenya.	The study employed a descriptive research design	The study found that e-procurement had been implemented to a moderate extent by the NHIF accredited hospitals.	The study focused on e-procurement practices but the current study focused on e-procurement implementation.
Sharifai, Mbaraka and Agaba (2013)	E-Procurement and performance of service organizations in Uganda.	Cross-sectional survey was used	A significant relationship exists between E-procurement and service organizations	Study focused on Ugandan service organizations and not dairy processing firms.
Makali (2015)	E-procurement and procurement performance of supermarkets in Nairobi	A census survey was done	Most critical practices that contribute greatly to procurement performance in supermarkets are e-tendering, e-requisitioning and e-sourcing.	The study only dealt with supermarkets in Nairobi while the current study focused on the dairy processing firms in Kenya.
Mwangi and Kagiri (2016)	Relationship between e-procurement and procurement performance in hospitality industry in Kenya	A multivariate regression model was also applied.	The study concludes that adoption of ERP, e-sourcing, e-tendering, E-informing was positively related to procurement performance.	The study only focused on the hospitality industry while the current study looked at the dairy industry in Kenya.

Source: Researcher (2017)

2.5 Challenges of E-Procurement Implementation

Rebecca and Ravi (2007) undertook a study aimed at finding out the B2B electronic procurement practices. The study sought to highlight the implementation challenges and success factors in a corporate environment. The study identified three challenges and implementation factors as follows: complexity in incorporating e-procurement with other information systems; absence of integration of the system and issues of standard and Lack of maturity in markets services based on e-procurement.

Edie *et al*, (2007) observed that many studies have been carried out and confirmed that benefits accrued from e-procurement have not been optimally exploited mainly because of unsatisfactory tangible results due to resistance to change in the adoption of information and communication technology. Changes in information technology are costly to an organization and hence become a hindrance in adoption and implementation. Firms undertake a cost benefit analysis looking at the cost of implementation of IT versus the benefits so as to justify its implementation. Internet based technologies are faced with serious security concerns such as hacking. Edie *et al*, (2007) argued that the information transmitted through the inter web may be interfered with and wrongly transmitted and may not be compatible with other softwares at the other end.

According to Galloway and Jamieson (2012), the barriers to e-procurement implementation are categorized into three; Environmental, Technological and organizational factors. Inadequacy and insufficiency of information technology act as barrier in implementation. The situation becomes wanting when the staff are not well skilled to support changes in information technology and its sophistication. Organization

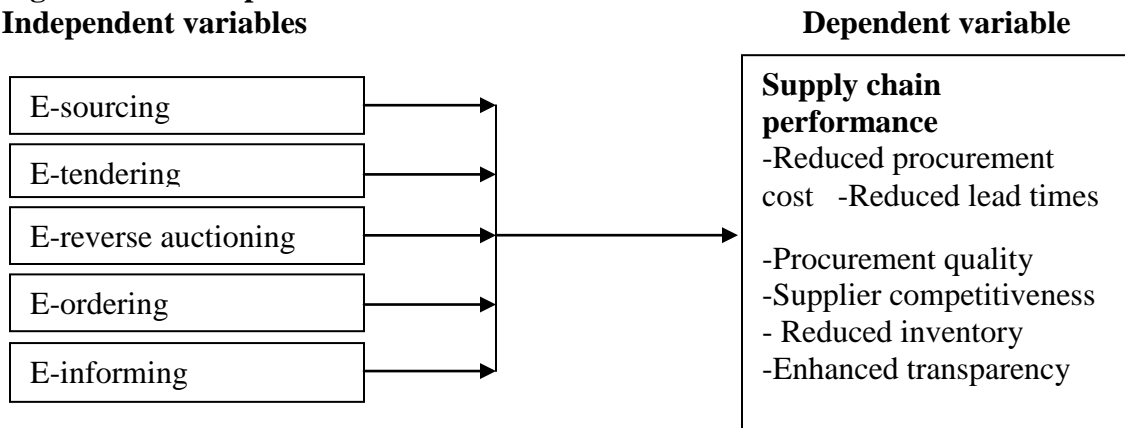
culture also acts as barrier to technology adoption as the employees may resist coupled by lack of support from the top management. Another barrier stems from lack of integration between players in the supply chain such as supply chain actors and business partners.

A study by Yen (2013) undertook a study focusing on migrating procurement onto the internet. The study reported that some suppliers may resist e-procurement especially where they may not derive benefits emanating from the change of the buyers' system. The study further indicated that in the advent of technological advancement and internet spread, companies have resorted into the worldwide web for advertisement and publicity as a common business practice.

2.6 Conceptual Framework

The independent variable was electronic procurement implementation (E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing) while the dependent variable was supply chain performance.

Figure 2.1: Conceptual framework
Independent variables



Source: Researcher (2017)

2.6.1 Hypothesis

H₀: There is no significant relationship between e-procurement implementation and supply chain performance.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methods that were applied in carrying out the study. The chapter covers the research design, population of the study, methods of data collection, data analysis and methods of data presentation.

3.2 Research Design

Descriptive research design was adopted in this study to clearly explain the variables of the study derived from its objectives (Kombo & Tromp (2006). The design was suitable in determining the relationship between electronic procurement implementation and supply chain performance of dairy firms in Kenya.

3.3 Population of the Study

The study population was the dairy firms in Kenya. According to Kenya Dairy Board, (2017) there are 42 dairy processing firms in Kenya (Appendix V). This study used a census since the population was not too large.

3.4 Data Collection

Primary data was captured by use questionnaires. The questionnaires had open and closed ended questions. The questionnaire was structured into four sections. Section A captured the general information of the firm and the respondents; section B captured extent of E-procurement implementation; section C covered the effect of E-procurement on supply chain performance of dairy firms while section D captured the challenges of E-procurement implementation. The respondents were supply chain officers or their equivalent. This research found it advantageous to triangulate methods whenever feasible that is, the study used both emails and “drop and pick later” method to administer the questionnaire.

3.5 Data Analysis

After collection, data was analysed using quantitative methods. To begin with the questionnaires used in the survey were evaluated for reliability using Cronbach's α measure for each construct in the questionnaire. Descriptive statistics identified the data patterns as well as consistency of the responses in each of the results from the survey. In order to test hypothesis, inferential statistics was applied where the dependencies among the components were analyzed using regression analysis. The relationship between electronic procurement and supply chain performance was measured by the following multivariate regression analysis.

Where:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e \text{ where;}$$

Y = Supply chain performance

α = Autonomous factors

X_1 = E-sourcing

X_2 = E-tendering

X_3 = E-reverse auction

X_4 = E-ordering

X_5 = E-informing

β s represents the beta coefficients of the independent variables

e = Error term

Table 3.1: Summary of data collection and methods analyzing data

Objectives/ Type of Variable	Questionnaire's part	Analysis of data
General information	Section A	Descriptive
Extent of E-procurement implementation	Section B	Descriptive
Relationship between electronic procurement implementation and supply chain performance	Section C	Correlation and regression analysis
Challenges in E-procurement implementation	Section D	Descriptive

Source: Researcher (2017)

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter presents data analysis and discussions. In this chapter data is presented and discussed to address the research objectives; extent of electronic procurement adoption, relationship between e-procurement implementation and supply chain performance and the challenges faced by dairy firms in Kenya when implementing e-procurement.

4.2 Response Rate

Detailed questionnaires were designed and distributed to establish the electronic procurement implementation and supply chain performance of dairy firms in Kenya. To make the analysis more comprehensive a total of 42 respondents were presented with the research instrument to fill where only 31 were returned after being successfully filled. This is a response rate of 74% which was considered satisfactory for the study. This response rate was considered satisfactory and corroborates Mugenda and Mugenda (2003) who stipulated that 50% response rate was enough for descriptive studies, 60% is good while 70% response rate was considered excellent.

4.3 Respondents Characteristics

The profile of the respondents was investigated in the first section of the questionnaire. Demographic characteristics of the respondents included: gender, age, college, work experience, and use of electronic procurement.

4.3.1 Gender

The study sought to find out the gender of employees in the dairy processing firms in Kenya. Based on the findings, majority (54%) of the respondents were male while 46%

were female. The study was therefore gender responsive and the findings were representative of both genders.

Table 4.1: Gender

Gender	Frequency	Percent (%)	Valid Percent	Cumulative Percent
Male	17	54	54	54
Female	14	46	46	100
Total	31	100	100	

Source: Research Data (2017)

4.3.2 Age

In terms of age, 35% of the respondents were between the age of 31 and 35 years while 26% were aged between 36 and 40 years. Results also showed that 5(16%) were between 41 and 50 years old and 10% were between 26 and 30 years old. The respondents who were between 20 and 25 years and those above 50 years old each represented 6.5% of the total number of the respondents respectively. Table 4.2 shows the summary of findings.

Table 4.2: Age

Age	Frequency	Percent (%)	Valid Percent	Cumulative Percent
20-25	2	6.5	6.5	6.5
26-30	3	10	10	16.5
31-35	11	35	35	51.5
36-40	8	26	26	77.5
41-50	5	16	16	93.5
Above 50	2	6.5	6.5	100
Total	31	100	100	

Source: Research Data (2017)

4.3.3 Level of Education

The results indicated that graduates formed a majority (62%) of the respondents while 20% had attained college education. Further findings showed that 18% of the respondents

had attained postgraduate qualification. The respondents were educated enough to be able to provide informed answers to the questionnaire items since all had college education and above.

Table 4.3: Level of Education

Level of Education	Frequency	Percent (%)	Valid Percent	Cumulative Percent
Collage	6	20	20	20
Graduate	19	62	62	82
Postgraduate	5	18	18	100
Total	31	100	100	

Source: Research Data (2017)

4.3.4 Work Experience in the Organization

In terms of the numbers of years that the employees had worked in the organization, the findings indicated that 42% of the respondents had an experience of between 6 to 10 years. Further findings indicated that 32% of the respondents had over 10 years experience. It was established that 26% of the respondents had experience of 1 to 5 years. The findings imply that the respondents were very experienced to be able to provide answers on electronic procurement and supply chain performance.

Table 4.4: Work Experience

Years	Frequency	Percent (%)	Valid Percent	Cumulative Percent
1-5	8	26	26	26
6-10	13	42	42	68
Over 10	10	32	32	100
Total	31	100	100	

Source: Research Data (2017)

4.3.5 Years of Electronic Procurement Usage

The respondents were required to provide information on the number of years that the organization had been using electronic procurement so as to determine the level of adoption as well as the success or failure of the system. According to the findings shown in table 4.5, majority (48%) of the firms in the dairy processing industry had adopted electronic procurement for duration between 4 to 6 years. Further findings indicated that 29% of the firms had used electronic procurement for over 6 years while 18% had used electronic procurement for a period of 1 and 3 years. Only 5% of the firms had used electronic procurement for a period of less than 1 year. It can therefore be deduced that the firms had used electronic procurement long enough to provide valuable information on electronic procurement and supply chain performance in the dairy industry.

Table 4.5: Years of Electronic Procurement Usage

Years	Frequency	Percent (%)	Valid Percent	Cumulative Percent
Less than 1	1	5	5	5
1-3	6	18	18	23
4-6	15	48	48	71
Above 6	9	29	29	100
Total	31	100	100	

Source: Research Data (2017)

4.4 Electronic Procurement Implementation

The first objective was to find out the extent to which e-procurement had been implemented in the dairy processing companies under study. The respondents were therefore presented with statements to rate on a likert scale (ranging from 5= Very great extent to 1= Very small extent).

The procurement processes include: E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing. The respondents indicated that their firms have implemented E-procurement: E-sourcing (M=3.65, SD=0.788), E-tendering (M=3.94, SD=0.700), E-reverse auction (M=3.82, SD=0.718), E-ordering (M=3.43, SD=1.014) and E-informing (M=3.62, SD=0.624). The summary of results is shown in table 4.6.

Table 4.6: Electronic Procurement Implementation

Electronic Procurement	Mean	Standard Deviation
E- sourcing	3.65	0.788
E-tendering	3.94	0.700
E-reverse auction	3.82	0.718
E-ordering	3.43	1.014
E-informing	3.62	0.624

Source: Research Data (2017)

The findings concur with GovWin (2012) who listed a number of forms of electronic procurement applications. The applications include; E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing as general elements of electronic procurement. Kamarulzaman and Mohamed (2013) conducted a study on application of e-procurement technologies where the findings indicated that security, commitment, cost, quality, efficiency, legal environment and delivery acceleration affect the extent of e-procurement adoption and application among agro based small and medium enterprises.

4.5 E-Procurement Implementation and Supply Chain Performance

The second objective of the study was to determine the relationship between e-procurement implementation and supply chain performance of dairy firms in Kenya. The respondents were hence presented with statements to rate using a scale of 1 to 5 where 1 is very small percentage, 2 is small percentage, 3 is moderate percentage, 4 is large percentage and 5 is to a very large percentage.

Table 4.7: Electronic Procurement Implementation and Supply Chain Performance

Electronic Procurement	Mean	Standard Deviation
E- sourcing	3.75	1.001
E-tendering	3.86	1.069
E-reverse auction	4.04	0.031
E-ordering	3.75	0.932
E-informing	3.67	1.071

Source: Research Data (2017)

The respondents indicated that E-sourcing has led to reduced procurement lead times and greater transparency in procurement processes (M=3.75, SD=1.001). The results also indicated that E-tendering has led to reduced paper consumption cost and enables suppliers and buyers to manage their transactions securing during online tendering (M=3.86, SD=1.069). It was also established that E-reverse auction has led to real time trading online and increased competitiveness and improving the price at which goods and services can be sold to a large percentage (M=4.04, SD=0.031). Further findings indicated that E-ordering has led to reduced errors in order transmission to and reduced inventory to a large percentage (M=3.75, SD=0.932). E-informing has led to increased quality and availability of information and has also led to increased purchasing intelligence (M=3.67, SD=1.071).

The findings concur with Makali (2015) who focused on the contribution of electronic procurement to procurement performance in supermarkets in Nairobi. The findings in this study show the most critical practices that contribute greatly to procurement performance in supermarkets are e-tendering, e-requisitioning and e-sourcing. The findings also corroborates Mwangi and Kagiri (2016) who indicated that through e-tendering,

compliance to policy at firm level had improved as the firm can quickly procure products and services from preferred suppliers and are unable to create maverick purchase. The study further revealed that e-informing influences the procurement performance of firms to a great extent because electronic procurement has the potential to reduce the cost of acquiring goods and services.

4.6 Regression Analysis

Multiple linear regression analysis was conducted to determine the joint relationship between the E-procurement implementation with supply chain performance. The following regression model was used:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e \text{ where;}$$

Y= Supply chain performance, α = Autonomous factors, X_1 =E-sourcing, X_2 =E-tendering, X_3 =E-reverse auction, X_4 =E-ordering, X_5 =E-informing, β s represents the beta coefficients of the independent variables and e= Error term.

Table 4.8: Regression Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.887401	0.787481	0.754786	0.8143

Source: Research Data (2017)

Predictors: (Constant), E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing.

The goodness of fit shown by the regression summary model in table 4.8 had a value of 0.7874 shown by R^2 which is coefficient of determination. It can therefore be deduced that electronic procurement implementation (E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing) explain 78.74 percent of the variations of

operational performance. Other factors that are not considered in the study contribute approximately 21.26% of the supply chain performance of dairy firms.

The study further conducted ANOVA to test significance. ANOVA comprises of the computations that give rise to information pertaining levels of variance within particular regression models and hence forms a basis for the testing of significance.

The significance level as shown in table 4.9 was 0.0% indicating that the data was good in reaching a conclusion since the p-value was less than 0.05%. In comparing the critical value and the F value, it was concluded that the F value was greater hence the model is statistically significant when it comes to prediction of how electronic procurement implementation affects supply chain performance. The F value at 5% level of significance was 3.546. Since F value is far much greater than the F critical value (2.60), this satisfies that the overall model was statistically significant and thus we reject the null hypothesis.

Table 4.9: Summary of ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig. (p-value)
1	Regression	1.825	5	1.209	3.546	.000 ^b
	Residual	1.273	25	.051		
	Total	3.098	30			

a. Dependent Variable: Supply chain performance

b. Predictors: (Constant), E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing

Source: Research Data (2017)

The equation obtained after running regression analysis in SPSS was

$$Y=1.851 + 0.804X_1+ 0.748X_2+ 0.701X_3+ 0.587X_4 +0.485X_5 + e$$

Table 4.10: Summary of Coefficients of Regression Model

	Unstandardized Coefficients		Standardized Coefficients	T-values	Sig. (p-value)
	Beta	Std. Error	Beta		
(Constant)	1.851	.620		0.912	.000
E-sourcing (X ₁)	.804	.233	.365	2.089	.049
E-tendering (X ₂)	.748	.435	.96	2.436	.032
E-reverse auction (X ₃)	.701	.336	.97	2.322	.036
E-ordering (X ₄)	.587	.127	.787	2.275	.025
E-informing (X ₅)	.485	.253	.630	2.028	.032

Source: Research Data (2017)

The regression equation shows that taking all factors into account (E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing) supply chain performance will be 1.851 at 95% confidence. Holding all other predictor variables constant at zero, a unit increase in E-sourcing will increase supply chain performance by 0.804. An increase in E-tendering by one unit will increase supply chain performance by 0.748. A unit increase in E-reverse auction and E-ordering will increase supply chain performance by 0.701 and 0.587 respectively. It was also established that an increase in E-informing by one unit will increase supply chain performance by 0.485. The Beta coefficients show the extent to which each variable contributes to the model. The larger the value means the larger the effect of predictor variable on dependent variable. The T and p values indicate the effect of predictor variable on criterion variable. From the results shown in table 4.10, all the calculated T values of the independent variables are greater than the critical value

(1.708) thus we reject the null hypothesis. P-values as shown in table 4.10 were greater than 0.05 affirming the statistical significance of the model.

4.7 Challenges in E-Procurement Implementation

The study also sought to establish the challenges faced by dairy firms in Kenya when implementing e-procurement. The statements presented to the respondents used the following rating criteria: - 5 = strongly disagree, 4 = disagree, 3 = not sure, 2 = agree, 1 = strongly agree.

Table 4.11: Challenges in e-procurement implementation

Statement	Mean	Standard Deviation
Fear of security threats and confidentiality of information	3.92	0.854
Inadequate technical expertise and staff in competencies	3.80	1.004
Lack of sufficient evaluation of systems before installation	3.72	1.098
Slow user acceptance of new information systems	3.64	0.577
Failure to comply with best practices	3.59	1.007
Lack of the digital format necessary for e-procurement systems	3.51	0.942
Inadequacy or absence of IT infrastructure	3.31	0.590
Lack of a widely accepted e-procurement software solution	3.12	0.054
Inadequate support from system developers and vendors	2.77	0.907

Source: Research Data (2017)

The results in table 4.11 shows that the challenges faced by dairy firms include: fear of security threats and confidentiality of information (M=3.92, SD=0.854), inadequate technical expertise and staff in competencies (M=3.80, SD=1.004), insufficient assessment of systems prior to installation (M=3.72, SD=1.098), slow user acceptance of

new information systems (M=3.64, SD=0.577), failure to comply with best practices (M=3.59, SD=1.007), lack of the digital format necessary for e-procurement systems (M=3.51, SD=0.942), inadequacy or absence of IT infrastructure (M=3.31, SD=0.590), lack of a widely accepted e-procurement software solution (M=3.12, SD=0.054) and inadequate support from system developers and vendors (M=2.77, SD=0.907).

This is further supported with the study by Rebecca and Ravi (2007) who identified challenges faced in the implementation of e-procurement which included; challenges associated with strategic initiative, legal infrastructure Edie et al, (2007), supplier enablement, Filipe (2009), technological integration and security issues.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study focused on electronic procurement implementation and supply chain performance of dairy firms in Kenya. This chapter summarizes the results presented in chapter four as well as provide conclusions, recommendations, limitations and suggestions for further studies based on the findings.

5.2 Summary of Findings

It was established that procurement processes in the dairy firms include: E-sourcing, E-tendering, E-reverse auctioning, E-ordering and E-informing. In terms of E-sourcing, the respondents indicated that their firms develop contract terms online, identifies new suppliers online, assess potential suppliers online and suppliers submit bids online. The respondents indicated that Submission of proposals and evaluation is done online. The respondents also agreed that the firms receives responses from suppliers online and that short listing of pre qualified suppliers is done through company website. The respondents further indicated that their firms had a pool of suppliers to choose from. It was also observed that the respondents agreed that E-procurement allows better comparison of quotes and that firms do sourcing from a number of suppliers online.

In as far as E-ordering is concerned, the respondents agreed that their companies staff make requisitions online and post item specifications is made online. The respondents also agreed that authorization is done online. The respondents indicated that their firms make payment of goods over the internet. The study also sought to find out the extent to which E-informing had been implemented by dairy processing firms in Kenya. The

respondents agreed to a large extent that advertising of tenders is done online and that communication with customers is done over company's website. The respondents also agreed to a large extent that suppliers respond to buyers' information online. Further findings also revealed that the companies promptly answer queries regarding procurement online though to a moderate extent.

The respondents further indicated that E-sourcing has led to reduced procurement lead times to a large percentage. E-sourcing has led to greater transparency in procurement processes. The results also indicated that E-tendering has led to reduced paper consumption and costs to a large percentage and enables suppliers and buyers to manage their transactions securely during online tendering. It was also established that E-reverse auction has led to real time trading online and increased competitiveness and improving the price at which goods and services can be sold to a large percentage. Further findings indicated that E-ordering had led to reduced errors in order transmission to a large percentage and reduced inventory. E-informing has led to increased quality and availability of information and had led to increased purchasing intelligence.

The study also sought to establish the challenges faced by dairy firms in Kenya when implementing e-procurement. Based on the results, the challenges faced by dairy firms include: fear of security threats and confidentiality of information, inadequate technical expertise and staff in competencies, lack of sufficient evaluation of systems before installation, slow user acceptance of new information systems, failure to comply with best practices, lack of the digital format necessary for e-procurement systems, inadequacy

or absence of IT infrastructure, lack of a widely accepted e-procurement software solution and inadequate support from system developers and vendors.

5.3 Conclusions

From the above findings the following conclusions were made. E-procurement has been implemented to varying extents by the dairy processing firms. The aggregate E-procurement implementation level for all the dairy firms is moderate indicating that some of the firms are still using the traditional procurement methods to a moderate extent. It can be concluded that dairy firms in Kenya have adopted e-procurement with the following e-procurement practices: receipt of online submission of proposals, advertisement of tenders online and online short listing of suppliers.

The study concludes that e-procurement has led to reduced lead times, greater transparency, reduced procurement costs, improved supplier competitiveness and reduced inventory in the dairy firms in Kenya.

The study concludes that the challenges of E-procurement implementation among dairy firms that were established from the study are: fear of security threats and confidentiality of information, inadequate technical expertise and staff in competencies, lack of sufficient evaluation of systems before installation, slow user acceptance of new information systems, failure to comply with best practices and lack of the digital format necessary for e-procurement systems.

Security seems to be the highest impediment to the implementation of e-procurement system within the selected firms where majority saw exposure of their valuable information becoming exposed to unauthorized parties who may use them to harm the

firm. Fear of security threats and confidentiality of information was notably considered to have a negative effect on the systems implementation.

5.4 Recommendations of the Study

Dairy firms in Kenya need to implement electronic procurement practices to enhance procurement activities. The study recommends that employees IT skills should be developed through training to acquire knowledge and competencies. An assessment of the IT skills of the employees should through training needs assessment.

The dairy firms should devise methods of motivating workers to adopt and use electronic procurement systems. If employees are encouraged to use the e-procurement, implementation of the same will greatly improve and hence supply chain performance will also improve. Given that there are limited resources, the dairy processing firms should allocate enough funds in electronic procurement as an investment in the company so as to streamline procurement process. Furthermore, only the initial investment in procurement of the necessary hardware, software and training of require personnel is resource intensive while the subsequent maintenance and operation cost are substantially low in comparison to the streams of benefits that will accrue from such investments.

Security matters on any IT platform are a concern for all. Despite this, investment in the necessary IT security features in any electronic system will provide substantial deterrent from any unauthorized access or manipulation. The dairy firms should therefore invest in security systems within their entire IT platform that will give them the ability to minimize their exposure to such risks.

5.5 Limitations of the Study

Questionnaire was the main research instrument which might suffer the problem of societal acceptability. Some respondents might exaggerate the information or even provide responses that are seen to be biased to their company. The study concentrated on a relatively small portion of the accessible population and the responses were only from a single industry. Therefore, the generalization of the results was limited and should be carried with caution. The respondents declined to provide information which they regarded as confidential. The study mitigated this by assuring respondents that the information was for academic purposes only.

5.6 Suggestion for Further Research

This study was limited to dairy firms in Kenya, it is therefore recommended further studies on the factors influencing e-procurement implementation of firms in different sectors in Kenya considering the critical success factors, extent of adoption, challenges and the impact on supply chain performance.

A comparative research should be done on the impact of e-procurement on the supply chain performance of both public and private sector firms in Kenya. This will identify the similarities and differences which can be used as benchmarks.

A study should be carried out to establish the reasons why there is minimal consumption of electronic procurement among some Kenyan firms despite the advantages that it brings.

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APPENDIX ONE: DATA COLLECTION LETTER



UNIVERSITY OF NAIROBI SCHOOL OF BUSINESS

Telephone: 020-2059162
Telegrams: "Varsity" Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE...16/10/2017

TO WHOM IT MAY CONCERN

The bearer of this letter **ONJALA LUKE .. WARIGA**

Registration No. **DG1/78605/2015**

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.



**PATRICK NYABUTO
SENIOR ADMINISTRATIVE ASSISTANT
SCHOOL OF BUSINESS**

APPENDIX TWO: QUESTIONNAIRE

This questionnaire seeks to collect data on the relationship between electronic procurement and supply chain performance. Kindly fill in the questionnaire. Any information availed will be treated with utmost confidentiality and shall be used for academic purposes only. Your identity shall not be revealed.

SECTION A: GENERAL INFORMATION

Name of company: _____

1. Gender

Male Female

2. Age

20-25 26-30

31-35 36-40

41 -50 51 and Above

3. Highest level of education

O Level A Level

College Level Graduate Level

Post Graduate Level Any other (Specify)

4. What position do you hold in this organization?

a) Supply Chain Officer

b) Other Positions (please specify).....

5. For how long have you been working in this organization?

1-5 years

6-10 years.....

10 years and above.....

6. For how long has the company used electronic procurement? [Please tick “√”]

Less than 1 year []

1- 3 years []

4-6 years []

More than 6 years []

SECTION B: ELECTRONIC PROCUREMENT IMPLEMENTATION

7. To what extent has e-procurement been implemented in your company among key activities in the procurement function? Use the following five point liker scale (1= Very small extent; 2 = Small extent; 3 = Moderate extent; 4= Great extent 5= Very great extent) [please tick (√), if not adopted leave blank]

Statement	1	2	3	4	5
E-sourcing					
Our firm develop contract terms online					
Our firm identifies new suppliers online					
Our firm identifies potential suppliers online					
Our suppliers submit bids online					
E-tendering					
Short listing of pre qualified suppliers is done through company website					
Submission of proposals and evaluation is done online					
The firm receives responses from suppliers online					
E-reverse auction					
Our firm does sourcing from a number of suppliers online					
E-procurement allows better comparison of quotes					
Suppliers compete in real time for the buyer's product request					
Our firm has a pool of suppliers to choose from					

E-ordering					
Our firm makes payment of goods over the internet					
Authorization done online					
Our company staff make requisitions online					
Posting item specifications is made online					
E-informing					
Advertising of tenders is done online					
Communication with customers is done over company's website					
Suppliers respond to buyers information online					
Our company promptly answers queries regarding procurement online					

SECTION C: E-PROCUREMENT IMPLEMENTATION AND SUPPLY CHAIN PERFORMANCE

8. To what percentage is the supply chain performance in your company affected by e - procurement? Use a scale of 1 to 5 where 1 is very small percentage, 2 is small percentage, 3 is moderate percentage, 4 is large percentage and 5 is to a very large percentage.

Statement	1	2	3	4	5
E-sourcing					
E-sourcing has led to greater transparency in procurement processes					
E-sourcing has led to reduced procurement lead times					
E-tendering					
E-tendering allows buyers and suppliers to securely manage their interactions during tendering process via online					
E-tendering has led to reduced paper consumption and costs					
E-reverse auction					
E-reverse auction has led to increased competitiveness and improving the price at which goods and services can be sold					

E-reverse auction has led to real time trading online					
E-ordering					
E-ordering has led to reduced errors in order transmission					
E-ordering has led to reduced inventory					
E-informing					
E-informing has led to increased purchasing intelligence					
E-informing has led to increased quality and availability of information					

SECTION D: CHALLENGES IN E-PROCUREMENT IMPLEMENTATION

9. The following statements shows concern the challenges faced by your company in the implementation of electronic procurement in your organization. Use the following rating criteria: - **1 = Strongly Agree, 2 = Agree, 3 = Not Sure, 4 = Disagree, 5 = Strongly Disagree**

Statement	1	2	3	4	5
Fear of security threats and confidentiality of information					
Inadequate technical expertise and staff in competencies					
Insufficient assessment of systems prior to Installation					
Inadequate support from system developers and vendors					
Slow user acceptance of new information systems					
Lack of a widely accepted e-procurement software solution					
Inadequacy or absence of IT infrastructure					
Lack of the digital format necessary for e-procurement systems					
Failure to comply with best practices					

APPENDIX THREE: THE EXTENT OF ELECTRONIC PROCUREMENT

IMPLEMENTATION RESULTS

E-procurement Implementation	Mean	Standard Deviation
E-sourcing		
Our firm develop contract terms online	3.76	0.584
Our firm identifies new suppliers online	3.65	1.005
Our firm assess potential suppliers online	3.64	0.849
Our suppliers submit bids online	3.56	0.712
E-tendering		
Submission of proposals and evaluation is done online	4.02	0.561
The firm receives responses from suppliers online	4.00	0.667
Short listing of pre qualified suppliers is done through company website	3.81	0.871
E-reverse auction		
Our firm has a pool of suppliers to choose from	4.02	0.556
E-procurement allows better comparison of quotes	3.97	0.907
Our firm does sourcing from a number of suppliers online	3.78	0.954
Suppliers compete in real time for the buyer's product request	3.52	0.454
E-ordering		
Our company staff make requisitions online	4.00	0.899
Posting item specifications is made online	3.42	1.054
Authorization done online	3.52	1.098
Our firm makes payment of goods over the internet	2.77	1.004
E-informing		
Advertising of tenders is done online	3.95	0.354
Communication with customers is done over company's website	3.79	0.598

Suppliers respond to buyers information online	3.73	0.590
Our company promptly answers queries regarding procurement online	3.01	0.954

Source: Research Data (2017)

**APPENDIX FOUR: ELECTRONIC PROCUREMENT IMPLEMENTATION AND
SUPPLY CHAIN PERFORMANCE RESULTS**

E-procurement	Mean	Standard Deviation
E-sourcing		
E-sourcing has led to reduced procurement lead times	3.88	1.054
E-sourcing has led to greater transparency in procurement processes	3.61	0.958
E-tendering		
E-tendering has led to reduced paper consumption and costs	4.02	1.042
E-tendering allows buyers and suppliers to securely manage their interactions during tendering process via online	3.70	1.096
E-reverse auction		
E-reverse auction has led to real time trading online	4.12	0.054
E-reverse auction to has led to increased competitiveness and improving the price at which goods and services can be sold	3.96	0.008
E-ordering		
E-ordering has led to reduced errors in order transmission	3.82	0.942
E-ordering has led to reduced inventory	3.67	0.921
E-informing		
E-informing has led to increased quality and availability of information	3.92	1.090
E-informing has led to increased purchasing intelligence	3.42	1.051

Source: Research Data (2017)

APPENDIX FIVE: DAIRY FIRMS IN KENYA

No.	Name Of Firm
1	Brookside Dairy
2	New KCC
3	Githunguri Dairy
4	New Summer A & L
5	Meru Central Co-Op
6	Aspendos Dairy
7	Kinangop Dairy
8	Kabianga Dairy
9	Sunpower Products
10	DonyoLesses
11	Pamside Dairy
12	Happy Cow Dairy
13	Afrodane Industries
14	Palmshouse Dairies
15	Biofood Products
16	Eldoville Farm
17	Stanley & Sons
18	Mois Bridge
19	Kinyagi Foods
20	New Island Dairy
21	NdumberiDfcs
22	Miyanji Dairy Farm
23	Raka Milk Processors
24	Egerton University
25	TeitaEstages
26	Baraka Cheese Farm
27	Kibarani Dairy
28	Palm Farm Ltd

29	Orchard Spillers
30	Mini Dairies
31	Countryside Dairy
32	Razco Ltd
33	Farmers Milk Processors
34	Hussein Dairy
35	Crown Creameries
36	Silent Valley Creameries
37	Solai Stores
38	Snowpack Dairy
39	Bico Farm
40	Mariakani Dairy Plant
41	Lari Dairy Alliance
42	East African Dairies

Kenya Dairy Board, (2017)