EFFECTS OF ENTERPRISE RESOURCE PLANNING SYSTEMS ON PROCUREMENT EFFICIENCY IN SELECTED MANUFACTURING ORGANISATIONS IN NAIROBI, KENYA

BY

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DECLARATION

I declare that the work contained in this dissertation has not been previously published or submitted elsewhere for award of a degree. I also declare that this is my own original work and contains no material written or published by other people except where due reference is made and author duly acknowledged.

Student Name: _____ Reg. No. _____

Sign: _____ Date: _____

I do hereby confirm that I have examined the Master's dissertation of

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And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

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ABSTRACT

Enterprise Resource Planning (ERP) is one of the major business system that assist organizations to manage their resources effectively. In the era of Information Technology, ERP system has become the necessary tool to operate business efficiently. The purpose of the study was to investigate effects of Enterprise Resource Planning (ERP) systems on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya. The objectives of the study were; to determine the effect of system controls of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, to establish the effect of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, to assess the influence of process flexibility of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi and to find out the effect of a faster process of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi. The study was carried out in five selected manufacturing organizations which were randomly sampled in Nairobi County. The organization are; East Africa Breweries Limited, Uniliver Kenya, Athi River, Tetrapak and Farmers Choice. The study adopted a quantitative descriptive research design and used questionnaires as the main data collection instrument. The target population was all the managers, senior and junior clerks in the procurement, production and finance departments respectively. Data was analyzed by Statistical Packages for Social Sciences and ANOVA was presented in form frequency tables, bar charts and bar graphs. The study found that the ERP systems has come out to be the best tool in coordinating and integration of organizations procurement processes due to its ability in processing information faster, track orders and inventory control, automation of orders and payments processes, lowering of set-up costs, reduction of order cycle, avoidance of data duplication in the procurement system module. The most covered area in the ERP was the customer relation management (80%) this implies that both the internal and external customers' needs had been well taken care of by the system leading to a faster process in the procurement. The study recommended that organizations should embrace technological changes that are rapidly changing on the environment that the organization exists. This was evident with the effects of ERP on timely delivery of products, improved customer relationship and was a reliable information system.

Keywords: Information Technology, Enterprise Resource Planning, Procurement, Systems, Manufacturing.

DEDICATION

I dedicate this work to my beloved wife Phelister and my wonderful daughters Flora, Martha and Latasha for their prayers and endless support. May God bless them and thank you.

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I would like to thank all my friends for their prayers and continuous support on this entire period of my research proposal. Special Gratitude goes to my supervisor Dr. Beatrice Okatch who has selflessly guided and encouraged me throughout the research project. I want to thank the management and staff of the following organizations who facilitated my data collection; Farmers Choice Limited, Tetra Pak, Athi River, East Africa Breweries and Unilver. God bless you all. To my wife and lovely children, parents, friends, my lecturers (Mr. Ochiri, Mose, Kariuki, Kobuthi, Dr. Ongore, Professor Ogao, Dr. Kosimbei, Dr. Otieno, Dr. Okonga); you all made me reach this far.

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ACRONYMS AND ABBREVIATIONS

B2B	Business to Business
ERP	Enterprise Resource Planning
GDP	General Domestic product
IS:	Information Systems
IT	Information technology
MRO	Maintenance Repair and Operations
MRP	Material Requirement Planning
MRPII	Manufacturing Resource Planning

OPERATIONAL DEFINITION OF TERMS

Manufacturing firms:

Manufacturing firms involve those entities that are engaged in transforming inputs into outputs in the most efficient and effective way in order to achieve customer satisfaction while attaining their organizational goals (Pycraft *et al.*, 2010).

System:

A system is a collection of components that work together towards a common goal. The object of a system is to receive inputs and transform these to outputs (Hardcastle, 2011).

Large Firms:

A large firm is an organization that has grown beyond the limits of a medium-sized business and has 250 or more employees. (QFinance Dictionary, 2014).

Legacy Systems:

They are older systems that remain vital to the organization. An application program which continues to be used because of the cost of replacing or redesigning it and often despite its poor competitiveness and compatibility with modern equivalents.(QFinance Dictionary, 2014).

E-procurement:

It is the use of the internet to operate the transactional aspects of requisitioning, authorizing ordering, receiving and payment processes for the required services or products (Lysons & Farrington, 2006).

Enterprise Resource Planning:

A business management system that is supported by multi-module application software that integrates all the departments or functions of an enterprise (Lysons & Farrington, 2006).

Procurement:

This refers to the process for acquiring the various resource inputs at the right price, of the required quality, in the right place and at the right time to the primary activities. (Rushton, Oxley & Croucher, 2000).

Supply Chain:

A group of inter-connected participating companies that add value to a stream of transformed inputs from their source of origin to the end products or services that are demanded by the designated end-consumers (Dr. Dawei Lu 2011).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The Enterprise Resource Planning (ERP) is an integrated set entailing subsystems that integrates all facets of the business, including planning, manufacturing, logistics and sales and marketing. The systems of ERP system integrate both the external and internal management information of all the entire organization. It embraces finance/accounting, manufacturing, sales and marketing services, management of customer relationship among other areas. The system of ERP automates organization activities with an integrated software application. According to Hossein (2004), ERP allows the flow of information between activities within the organization as well as manage outside connections with stakeholders.

Procurement encompasses the whole process of acquiring goods or services. It is initiated when the agency or a firm identifies a need and decides on its procurement requirement. The process of procurement continues through the following activities; assessment of risks, soliciting alternative solution, awarding, contracting and delivering and paying of the product or service. Zhao & Fan (2007) observe that modern procurement extends to the ultimate disposal of the property of service at its final use. The procurement managers managing modern day procurement source organization functions from both strategic and operational levels. They are proactively engaged in building the networks of suppliers, estimating, controlling and reducing costs besides performing other functions and sneering service levels (Shallat & Udin, 2012). The job functions of the procurement officers are increasingly becoming cross functional together with supply chain and manufacturing functions.

Procurement is one of the key links in the supply chain and has a significant influence on the overall success of an organization. It is crucial for any organization to ensure that there are sufficient supplies of raw materials at the right price, of the required quantity, in the right place and at the right time (Rushton, Oxley & Croucher, 2000). According to Zhao & Fan (2007), the new generation of the system of ERP ought to be developed basing on the principles of low cost, high quality and efficiency. Genoulaz & Millet (2007) have observed that, the recent years have seen wider use of the ERP software in many sectors like production, services, finance, transportation and public utilities

Many large manufacturing organizations are still using legacy systems which have affected the effectiveness of procurement function operations as a function which handles large sums of money in any organization. The result of this is high operational costs, loss of customers due to delays or poor services and loosing stocks due to inaccurate inventory management and the major suspect of this is the use of manual or traditional legacy procurement systems. These systems of ERP have become major pre-requisites, a price of entry, and a strong and integrated IT infrastructure for many manufacturing organizations. This has enabled them to compete in the local and global marketplace given them a global competitive advantage in the economy specifically with the current introduction of the e-business portfolio (Shallat & Udin, 2012).

ERP systems can be a useful tool for manufacturing organizations to build sound and robust information systems infrastructure and enable management to take better decisions based on accurate and on-time information. These systems improve product quality and process efficiency and also enhance information sharing and information quality among different functions inside the company as well as to suppliers and other partners in the procurement process. This enhanced overall organization efficiency, particularly procurement efficiency, help

to achieve good performance of the entire organization and improve long term profitability (Shallat & Udin, 2012).

1.1.1 *Manufacturing Organization in Kenya*

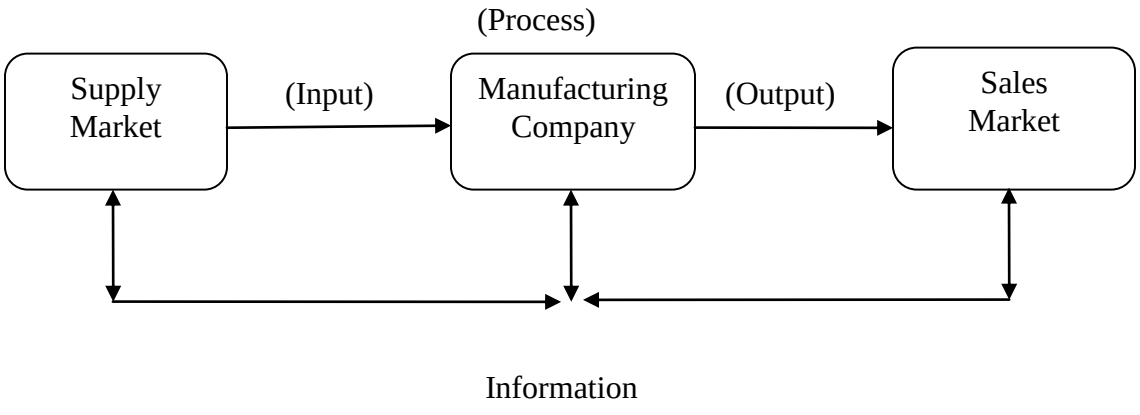
The manufacturing sector in Kenya is recognized as an important institution for economic development. Growth targets for manufacturing sector are ambitious and to meet the targets, it requires increasing investment levels in ERP systems to be able to reach GDP levels of above 30% (Bigsten, Kimuyu, & Soderbom, 2010). In the recent past, many manufacturing organizations have reduced the number of suppliers they work with in order to reduce the cost of transactions. In addition to supplier base reduction, many companies are moving away from the traditional adversarial relationship with suppliers towards a more partnership based relationship, which recognizes that parties need to make profits to survive. But, there may be areas where through co-operation and the adoption of ERP systems, real cost may be removed from the supply chain (Rushton, Oxley & Croucher, 2000).

Hsu and Chen (2004) posit that, manufacturing function work is to control costs and schedules of the entire production process and inventory related to value addition and process support, while procurement focuses on buying goods and services in the right quality, quantity, from the right source, at a reasonable cost within the required time. This interaction is the source of duty conflicts between procurement and manufacturing functions, which suggests ERP being a useful integrated tool to bring efficiency procurement functions of existing large manufacturing organisations.

FIGURE 1

MODEL OF MANUFACTURING COMPANY

Source: (Baily, Farmer, Jessop & Jones, 1994, p.44)



1.1.2 ***Enterprise Resource Planning Systems***

The world of manufacturing has become more competitive making implementation of ERP systems very crucial in bringing changes in manufacturing organizations which affects the way business is conducted, and reorganizing procurement processes. Stakeholders involved in the procurement process and the entire organizations in particular need to realize and understand these crucial and very important changes, which they conducted in a new and different manner from that previously performed in their legacy systems (Shallat & Udin, 2012).If management does not realize and understand the actual effects of ERP system on the organization and on its business efficiency, and not prepared for the large changes, it will affect the performance of the entire organization.

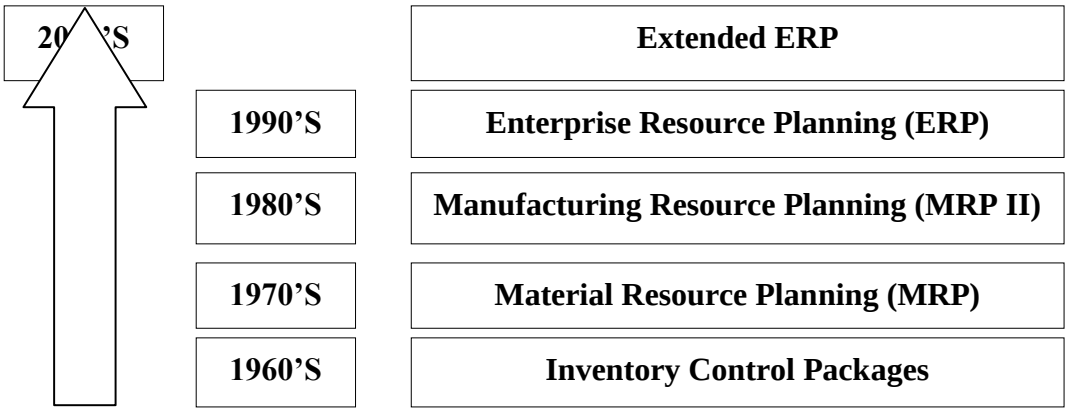
The ERP systems hold the promise of improving business process and at the same time decrease costs (Ahmad, 2009). This is because ERP systems enhance communication and coordination, bring together administrative activities, increase efficiency in the information system functionality and minimize the maintenance costs of information system. An ERP system which has been implemented successfully can act as the central tenet of business

intelligence for a firm by offering an integrated objective of the business processes. According to Chen (2011), the systems of ERP offer seamless integration of various activities across functional areas with efficient workflow standardization of various practices of business and access to real time up to date data. Figure 2 summarizes the historical events related with ERP (Rashid, Hossain and Patrick, 2002):

FIGURE 2

ERP EVOLUTION

Source: (Rashid, Hossain & Patrick, 2002, p.4)



1.1.3 *Procurement Efficiency*

Procurement is a very important function in any organization. Traditionally, procurement was mainly associated with buying goods and services for an organization without following systems and ethics governing the procurement function. But in the recent past, procurement has and is performed by competent, independent and people of high integrity known as procurement officers or buyers. They carry the whole process from the purchase request point to when the supplier is paid for goods, services and works supplied through ERP systems. The ERP system has become a fixture to provide a basis for business process management integration across business functions (Mabert *et al*., 2000).

In the procurement of goods, proper and detailed specifications are critical to attain goods of good quality. Procurement identifies what is required from the contractor and he is expected to bid against the specifications given in the bid document. According Caldewell, Roehrich & Davies, 2009), the nature of procurement determines the specifications which can be either simple or complex. In order to ensure fair and impartial competition, the specifications should be defined in such a manner that it allows widest possible competition and should not favor any single contractor or supplier nor put others at a disadvantage. Caldwell, Roehrich & Davies (2009) observe that specifications should be generic and should exclude the reference to the brand names, the numbers of the models as well as numbers of catalogue or similar classifications.

1.2 Problem Statement

It is the essence of companies to ensure continuity of key operations with fewer resources. The enterprise resource planning (ERP) system is being considered by many companies to be efficient, improve production process, minimize complexities, integrate the systems and erase redundancy. Although ERP's systems pledge to be of beneficial to companies and substantial investment of capital, not all the implementations of ERP generate successful stories. According to Ehie & Madsen (2005), the implementation process of ERP have commonly delayed an estimated schedule and overrun the budget initially set. There are some organizations which have not yet experienced the efficiency of the ERP system thus causing more frustrations. These frustrations may propel users to come up with more innovative solutions and methodologies for purchasing, managing and tracking the resources of the organization. The self innovations may negate the full benefits of ERP systems like centralized planning, efficient procurement and insightful financial reporting. Failure of the business groups to submit up to

date data hinders effective activities of the ERP system like generation of accurate and timely information and other management reports.

At the moment, manufacturing organizations have started to realize that for them to exist and grow globally in business environment; they ought to improve not only their organizations efficiency, but specifically their procurement function which handles over three quarters of any organizations budget through procurement. This is because procurement does not involve only the internal organization stakeholders, but also external stakeholders which largely include suppliers of goods, services and works as well. These emerging issues have lead organizations to make tough decisions of investing heavily in developing and implementing better technologies and systems such as enterprise resource planning (ERP) system (Davenport & Brooks, 2004).

There are some local studies which have been done regarding ERP systems in Kenya. Adhiambo (2013) did a study on use of the ERP system but as a strategic approach by the Equity Bank limited in Kenya. The study revealed that enterprise resource planning system approach is an important investment that institutions need to consider to remain competitive. Other scholars (Kiburi, 2008, Katana, 2011 and Ogada, 2013) have done studies related to ERP systems and procurement in various Kenyan organizations. Soh & Sia (2004) on studies on ERP system assert that it reflects western ways of doing things. Boersman and Kingman (2005) argue that the benefits of implementing ERP as revealed by most studies are applicable to the developed countries but they advocate the need to conduct more studies in developing countries regarding ERP systems and procurement. These findings generated a fertile ground for the study to establish the effects of ERP systems on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

1.3 Objectives

1.3.1 General Objectives:

The general objective of the study was to establish the effect of enterprise resource planning (ERP) systems on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were:

i. To determine the effect of system controls of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya.
ii. To establish the effect of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya.
iii. To assess the influence of process flexibility of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya.
iv. To find out the effects of a faster process of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya.

1.4 Research Questions

The research endeavored to answer the following questions:

i. What is the effect of system control of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya?
ii. What is the effect of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi, Kenya?

iii. How do process flexibility of Enterprise Resource Planning influence procurement efficiency in selected manufacturing firms in Nairobi,, Kenya?

iv. What are the effects of faster process of Enterprise Resource Planning in procurement efficiency in selected manufacturing firms in Nairobi, Kenya*?*

1.5 Justification of the Study

Procurement function plays a strategic role in organizations by enabling firms to achieve value for money in terms of right quality, right prices, faster lead times and buying from the right sources. Manufacturing organizations need to ensure goods; services and works are procured by meeting the required objectives of the purchase. There is therefore the need to have the best enterprise resource planning systems which integrates the whole supply chain considering the effects to procurement and the entire organization. This study consequently sought to find out the effects of ERP systems on procurement efficiency in selected manufacturing organization in Nairobi, Kenya.

1.6 Significance of the Study

Organizations cannot achieve its profitability expectations if it does not embrace ever changing technology in the form of ERP systems. These systems need to be given greater priority from the top management to lower management level since they positively affect the end result of any organization. The study findings may be beneficial to the following: first, the top management to get to know the importance and benefits of ERP systems in an organization. The organization leadership was able to assess the best system to adopt based on the type of business operation based on the different stakeholders involved, which was trickled down to the involved parties in the whole process of procurement. Second, the government in identifying the best ERP

systems to use and their benefits to be able to facilitate controls, cost saving, flexibility and faster process to the benefit of the entire citizenry. Finally, the study findings may benefit upcoming future professionals in knowledge creation especially in the specific area of procurement, and supply chain management. This is a crucial part in any organization set up both private and public, and this puts us on the forefront of innovations in current ERP systems.

1.7 Scope of the Study

This study focused on selected goods manufacturing organizations. Both internal customers (employees) and management in procurement function were engaged in giving their views on ERP system, and to what level it affects procurement efficiency in an organization. Random selection was used to distribute questionnaires during the study.

1.8 Delimitation of the Study

This study was focused to finding out whether the manufacturing organizations in Nairobi, Kenya have adopted Enterprise Resource Planning (ERP) systems in their procurement function in order to achieve efficiency. The research focused on some selected manufacturing organization in Nairobi City and its environs. For confidentiality purposes, names of the organizations and respondents were omited in the findings.

1.9 Limitations of the Study

The study encountered the following limitation; one, organization information confidentiality. To counter this challenge, the researcher acquired an introduction letter from the KCA University clarifying the academic purpose of the study. The busy schedule in the manufacturing firms made difficult for the respondents to have some time for filling of questionnaires. To address this, questionnaire submission and filling was done during lunch

hours, and a special arrangement between the researcher and the respondent to meet after office hours was done.

1.10 Assumptions of the Study

The researcher assumed that the manufacturing organizations have introduced enterprise resource planning systems in their procurement function which is being used to carry cost saving analysis, having a flexible process and faster to be used to control the entire process in attaining efficiency in the selected manufacturing organization.

1.11 Research Ethics

The researcher sought permission to carry out the study from the relevant authority and from the participants who participated in the study. The nature and the purpose of the research was explained to the respondents by the researcher. The researcher respected the individual's rights to safeguard their personal integrity. During the data collection period, the respondents were assured of anonymity, confidentiality and they were affirmed of their willingness to withdraw from the study freely and at any moment if they wished to do so. No names or personal identification numbers reflected on the questionnaires except the numbering for questionnaires, which was for purposes of identification of data during data editing. The results of the study shall be availed to the relevant authority and to those participants who may have the interest in knowing the results.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature and scholarly articles, identified theoretical framework, empirical review towards the effects of ERP systems on procurement efficiency in selected manufacturing organizations and the authors view towards the specific objectives. The independent variables and dependent variable were identified and explained. In this section, the study briefly discussed each theoretical framework and translated it to ERP and procurement efficiency.

2.2Theoretical Review

According to Hsu and Chen (2004), the effectiveness of interaction between manufacturing and procurement function often determines efficiency and profitability of an organization. The system of ERP addresses business functions issues including manufacturing and procurement. Kahn (1994) used contingency, system and socio-technical theory to interpret interaction among functions. This research model on contingency theory and socio-technical theories were found effective in studying the effects of ERP systems on procurement efficiency in selected manufacturing organizations.

2.2.1 Contingency Theory

Integration of functions and firms is currently a big challenge in modern manufacturing organizations. Contingency theory argues that integration of functions is as a result of environmental factors which are uncertain and complex on an organizational and its structure

(Hsu and Chen 2004). According to Ruekert & Walker (1987), interaction among functions in an organization is contingent to internal and external factors such as procurement structures and manufacturing structures. With the different degrees of uncertainties and environmental factors, ERP system is required to improve the efficiency of the procurement function in an organization by using existing information to forecast.

2.2.2 Socio-technical Theory

The Socio-technical theory studies about social aspects of people and technical aspects of organizational structure, and processes, and the effects to technology implementation (Bostrom & Heinen, 1977). Therefore socio-technical theory is about joint optimization which designs the social system and technical system in tandem to enable work efficiency. According to Walker, Stanton, Salmon and Jenkins (2007), the social and technical factors interact to generate conditions for successful/unsuccessfulness of system performance in the efficiency of functions in an organisation. Socio-technical theory aims at addressing the problem of inefficiency by implementing technological solutions in the form of ERP systems which smoothly brought together people and technical structures of procurement functions.

2.3 Empirical Review

Journals and articles on previous studies already done in relation to ERP systems and how they affect procurement as a function in selected manufacturing organizations to attaining efficiency was reviewed in this section.

2.3.1 System Controls

By using integration technologies to integrate management of document activities, human resource intervention is only necessary in activity control (Davis and Leonard, 2006). Also,

spending control increase, supplier transparency, procurement activities decentralization and rationalization of supply base is evident. Quality information availability and integration of procurement with other business processes has facilitated controls in the selected manufacturing business processes.

The procurement function with the introduction of ERP systems has improved efficiency in the organized structure specifically the reduction of procurement function size, and the number of departments involved in the procurement process. Chances of doctoring information in the system is more than impossible and if it is done, it shows exactly who did it, when and at what time which makes it easy to trace for feedback. Reference of all the reports and transaction done is available any time on a click of a button making controls to be of the highest standards especially the ones involving non-ethical practices. Reduction in process flow times with simplifying activities and the possibility to control process. (Piotrowicz & Irani, 2009).

The study also found that users lacked support thus affecting the organization while the quality satisfaction was affected by technological newness. The team's skills like general expertise, application complexity and user experience affected the system development. According to Tomblin (2010), it is important for understand user needs and mitigate user resistance. He also notes that project management should be set properly including the definition of the project scope, sponsorship of top management and creation of a project team possessing appropriate skills.

According to Hardcastke (2011), both the business process re-engineering literature and the literature of the ERP system assert that ERP as a system on its own cannot improve the performance of a company until the company restructures its operational processes. Rashid &

Walker (2002) posit that the implementation of ERP project ought to be a business initiative. Organizations are required to gain strategic goals clarity and a constancy of purpose. To achieve organizational goals there is need to have an outcome orientation. Another major risk within an ERP project is lack of control in the entire project. The loss of control arises in two ways; not able to control the team involved in the project and also not able to control staff when the system is fully in functional.

Much has been written on project escalation on risks related to control of critical projects before initial development of the ERP systems. Lack of control over project team results from the decentralization of decision making and subsequent ineffective ratification of decisions. It is common for organizations to form an ERP system implementation team involving individuals with relevant specific knowledge associated with the implementation of the ERP system. This is done to ensure the collocation of knowledge with decision rights. According to Shata, Udin & Amana (2012) the team is assigned to the decision rights.

Both the business process re-engineering literature (Hardcastle, 2011) and the literature on ERP literature suggest that ERP system on its own cannot improve the performance of company. Rashid & Walker (2002) remarks that organization performance can improve if the organization restructures the way it operates. The system of ERP ought to be a business initiative. Organizations are required to gain strategic clarity and a constancy of purpose. In order to achieve organizational goals an outcome orientation is needed. Loss of control in the ERP project can arise in two different ways. One it is through the lack of control of the team mandated to implement the ERP project and two it is through the lack of control of staff once the system is fully functionally and operational. Various studies have been done on risks related with large project controls prior the development of ERP software.

Procurement Information System .is a database that collects, records, interprets, analyzes, reports and disseminates data regarding procurement. This data is crucial as it is used for making critical management decisions regarding organizational procurement. An effective and efficient procurement information system is the one that assists in making delivery of goods and services at appropriate cost through a clear policy regarding the procurement procedures of the company (Majed, 2002). The ERP system controls offer the service platform to improve the efficiency of enterprise work among them, procurement, accounting, management etc. (Tomblin, 2010). The intention of this study was to determine the effect of system controls of Enterprise Resource Planning on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

2.3.2 Cost Savings

Electronic procurement as a function affects the strategic and operational benefits. The former is summarized as a better relationship among trade partners leading to lasting relationship and increase information flow, the operation benefits enhances minimal execution of the cost of interface activities due to an increase in the productivity of the workforce. All this is translated to the overall reduction in procurement related costs leading to an efficient organization. According *to Lyson & Gillingham (2003), cost savings in transaction costs is evident by automating requisitioning, purchase order management and accounting processes. ERP systems by the use of electronic means and internet technology including on-line ordering, empowers system users through integrating buyers and suppliers, requisitioners and accounts functions.* Analysis done by a UK based chemical company indicated that the average cost of processing a paper-based procurement transaction from receipt of a requisition to payment of the supplier is about $60, and with a fully automated process that figure reduces to around $8.

The ever changing requirements of internet based business processes are challenging many organizations which need upgrade of their current ERP systems. It is necessary for organizations to keep abreast of the new and evolving e-business imperatives. A study by Muotongwa & Kefa (2011) on ERP implementation in SMEs in Kenya found that the affordability of proprietary ERP for SME as problem hindering them from implementing the ERP system. Ogada (2013) found that ERP systems were cost effective in that they allowed organizations to enjoy the benefits of both centralized and decentralized processing simultaneously.

The Enterprise Resource Planning (ERP) and Supply Chain Management (SCM) system have today eliminated much of the busy work linked with making production forecast and placing orders. For instance the business to customer electronic commerce as facilitated by the internet, allows organizations to interact directly with their customers without intermediaries. According to Pani *et al* (2011), use of corporate extranets has also allowed organization to connect to their suppliers and distributors as well. This has reduced costs in procurement and distribution process (Shata, Udin & Aman, 2012). These findings were observed in developed countries because of the improved IT infrastructure among other factors. There are limited studies of the same nature of ERP cost saving in procurement efficiency in developing countries like Kenya. Thus, the study found it relevant to establish the effects of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

2.3.3 Process Flexibility

Information is power in procurement as it helps practitioners in making informed decisions on behalf of the organization at the same time be able to relay accurate information in any format easily understood by management. This information is generated on-line having an opportunity to share the same information with other staff for different usages. This gives an operational benefit to manufacturing which has a positive effect to the organization (Firk, 2006). With the adoption of procurement in ERP systems, the procurement personnel are able to correct, change data in the systems in case of a error without changing i.e. purchase order numbers or purchase request numbers, which is contrary to the manual traditional system which in case of an error, the buyer/purchaser is forced to destroy a whole document. This flexibility and agility in the process promotes efficiency in the whole process (Garrido*et al*., 2008).

ERP post-implementation studies acknowledge how those modifications take different forms (Ng & Gable 2010), and vary in their impact on organizations. Modification and additional changes to the ERP system after it has been implemented is called maintenance. Ng *et al* (2010) cites that there are motivations for modifying the wider IS and ERP systems. It should be noted that the type of motivation behind modifications of ERP systems has not been used as the theoretical lens to conceptualize the outcome of modifications to ERP systems. Motivation in this case is not a monolithic construct. Little has been done to understand the relationship between the type of modification and the kinds of results that organizations experience from an organizational motivation perspective.

Smith et al (2008) defines organizational motivation as the high-level objectives of the organization to start a specific project. Rahim et al (2011) supports this definition by asserting

the existence of two types of motivations for the Information Technology projects. ERP systems have two types of motivation: business motivation and technical motivation. Business motivation infers to an organizational purpose to gain benefits associated with customer satisfaction and general productivity (Tomblin, 2010). On the other hand, technical motivation on refers to an organization intent to gain benefits basing on the technical advantages within the system (Themistocleous et al, 2001).

The ERP system is considered as a complex multimodal software application integrating all the company's process for the purpose of perfection and growth. It integrates all enterprise function right from production and R&D, financial, human resource, marketing, procurement and management function. The functional units in a firm are able to communicate directly with each other via the ERP system. However, Maina (2009) observed that a lot of organizations which had implemented ERP did not gain the intended success by implementing the ERO system. This was because they used the software without operating the necessary organizational changes. Soh and Sia (2004) concluded that to make the ERP systems generate the intended effect; their implementation requires sometime and radical change. This implies that the process has limited flexibility. The study sought to understand more regarding this argument by assessing process flexibility of Enterprise Resource Planning on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

2.3.4 Faster Process

ERP systems has come out to be the best tool in coordinating and integration of organizations procurement processes due to its ability in processing information faster, track orders and inventory control, automation of orders and payments processes, lowering of set-up

costs, reduction of order cycle, avoidance of data duplication in the procurement system module (Trott, Hoecht & O'leary, 2004). Faster Process is evident in areas of purchase orders and purchase request approval and the overall document management, whereby it is done online the moment documents are keyed in and saved in the system. The relevant approvers are triggered to approve the moment the entries are saved and after approval documents are released and emailed to the relevant people hence completely remove paper work, and integration of vendors in the entire supply chain from request for offers to payment of invoices (Kalakota & Robinson, 2001).

In general, Enterprise Resource Planning Systems impacts positively on procurement efficiency in manufacturing organizations. According to Hwang and Min (2013) ERP systems has proved to be a major breakthrough information technologies that can bring positive change in the manufacturing industry. ERP popularity grew in the last couple of years by its market share standing at $28.8 billion in 2006 to $47.5 billion in 2011, and it has established an estimated growth of $67.7 billion by 2017 (Jacobs, 2007; Lucintel, 2013). ERP is the backbone for many organizations' supply chain processes. Supply chain operations are highly transactional: updating supplier information, managing inventory, executing purchase orders, processing invoices, making payments. Many activities are document-intensive, being initiated by a document received from an external party or a document produced during the course of transaction. When documents associated with transactions are not readily available to the person(s) executing the transaction, it delays ERP processes.

Although ERP systems have some document management capabilities, they do not have the breadth, depth and enterprise scalability to keep up with the needs of a large enterprise. Also, ERP document management systems do not readily accommodate the sharing of a bigger range

of supply chain content budget plans, product quotes, fax, contracts, vendor email, warranties beyond the ERP system (Lucintel, 2013). And although ERP systems have workflow capabilities, many supply chain processes begin outside of the ERP system or extend outside of the ERP system when integrated with other systems, or when exceptions to the process need to be rectified. The lack of a seamless workflow among systems hinders supply chain efficiency.

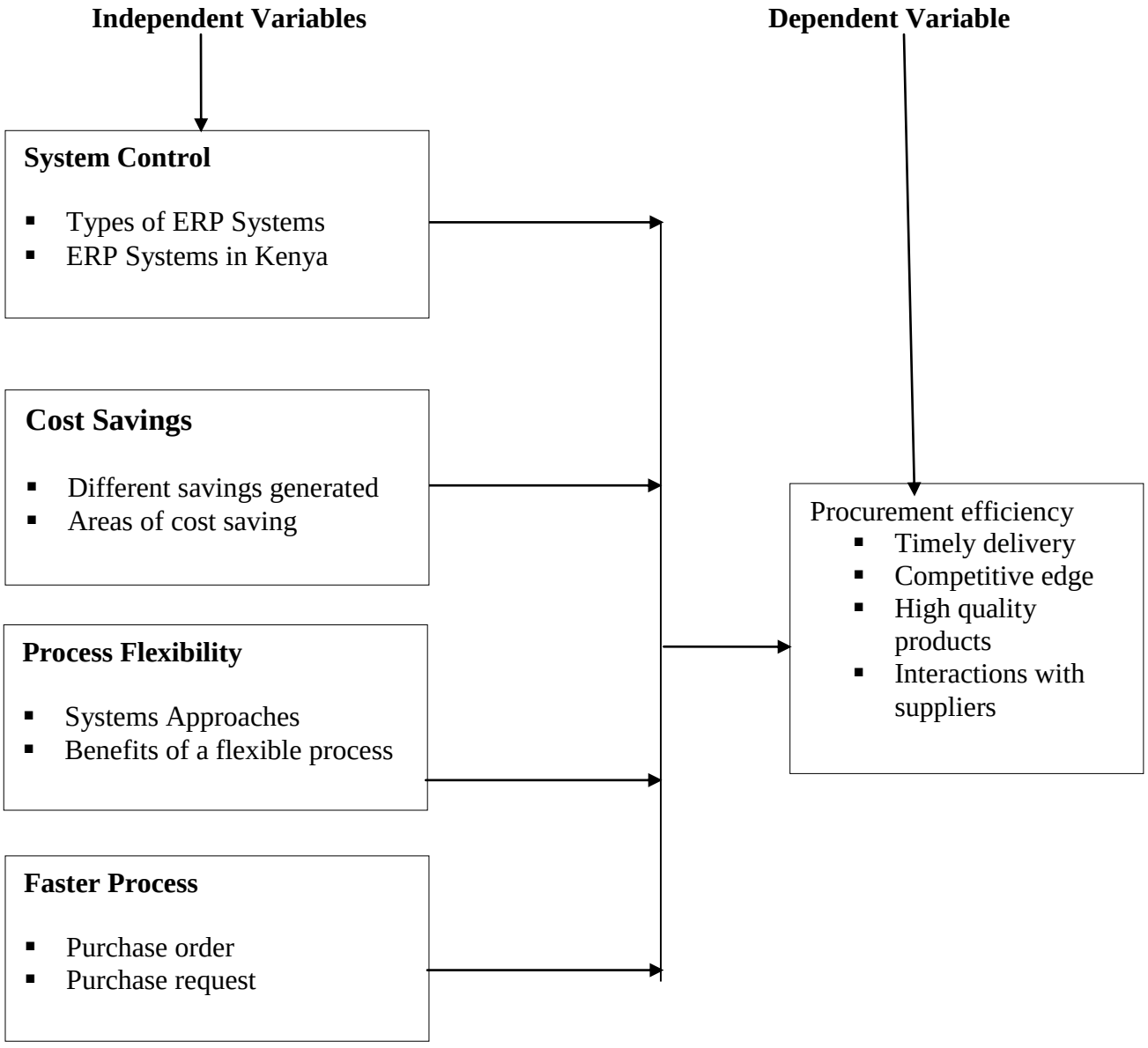
Nyagah (2006) noted that ERP system assist in transacting simple and complex inter-organizational systems improving work efficiency. Njuguna (2011) noted that ERP system was preferred in many organizations because it was user friendly and had was quick in processing data. However, Maina (2009) states that some institutions had experienced slower processes of organizational functions with regard to ERP. This was later asserted to the fact that some big organizations had used ERP systems which were not their company size. Mwatua (2010) indicated that although ERP system had faster process with regard to instant access of real time data, they required regular database update and encryptions. Nangithia (2010) and Mwatua (2010) assert that ERP systems have changed the manner in which organization operate their business by offering online and real time information enhancing communication efficiency. Considering the fact that communication efficiency has been identified as an effect of faster process of ERP, the study found it relevant to find out the effects of faster process of Enterprise resource Planning on procurement efficiency in selected manufacturing organizations in Nairobi, Kenya.

2.4 Conceptual Framework

This section highlights how independent variables affect the dependent variables. It displays system controls; cost savings, process flexibility and faster ERP procurement processes affect Procurement in selected manufacturing organizations in Nairobi, Kenya as indicated in figure 3.

FIGURE 3

CONCEPTUAL FRAME WORK



CHAPTER THREE

RESEARCH METHODOLGY

3.1 Introduction

This section analyses how the research was conducted which covers research design, the study population, sampling procedure & sample size, data collection instruments and procedures, instruments validity and reliability, data analysis and presentation methods.

3.2 Research Design

Research design is about the type of information that is required to be collected so as to address the research question (Kothari, 2009). The study adopted a quantitative descriptive research design. This is because descriptive quantitative research allows manipulation of one variable at a time filtering out external factors (Sow & Sia, 2004). The study intended to manipulate the dependent variable of procurement efficiency against the effects of Enterprise Resource Planning systems in selected organizations in Nairobi. The fact also that quantitative studies lead to a final answer and narrow down of possible directions for follow up research to take place made this research design more appropriate for this study.

3.3 Study Population

According to Mugenda & Mugenda (2003) study population refers to an entire group of individuals, events or objects having common observable characteristics. The study population was all department managers, senior department officers, and junior clerks in the procurement, operations/productions and finance departments respectively, employees working in the Procurement, Production or Operations and Finance departments. The selected manufacturing

organizations include; East African Breweries Limited, Farmers Choice, Unilever Kenya Limited, Tetra Pak Limited and Athi River Mining Limited.

The department managers were sampled as they are responsible for the induction of the ERP systems in organizations because they are involved in the senior level of organizing, planning, leading and controlling of the manufacturing activities. The senior department officers and junior clerks were considered appropriate because they are the actual implementers of the ERP system. They stand a high chance of giving relevant information regarding its effects on procurement efficiency. The study sampled the five organizations because they were easily accessible to the researcher thus minimizing the study cost and reducing time spent for data collection. Departmental population size for the selected organizations is elaborated in table 1 below

TABLE 1

POPULATION SIZE PER ORGANIZATION

Companies	**Procurement**	**Production**	**Finance**	**Total**
EABL	15	100	16	131
Farmers Choice	8	40	6	54
Uniliver Kenya	12	65	10	87
Tetra Pak	5	45	8	58
Athi River	10	50	10	70
Total	**50**	**300**	**50**	**400**

From the population size per organization, 30% of the five organizations sampled per department were selected to allow for a full representation of all groups in the entire five organizations, making the anticipated total selected sample size to be 120. It is well highlighted in table 2 below.

TABLE 2

SAMPLE SIZE

Companies	**Procurement 30%**	**Production 30%**	**Finance 30%**	**Total**
EABL	5	30	5	40
Farmers Choice	2	12	2	16
Uniliver Kenya	3	19	3	25
Tetra Pak	2	14	2	18
Athi River	3	15	3	21
Total	**15**	**90**	**15**	**120**

3.4 Sampling Procedure and Sample Size

The respondents were selected by the use of simple random sampling. The study mainly focused on respondents from procurement, finance and operations/productions departments. The population was preferred because they tend to have vast knowledge regarding ERP and procurement as compared to other respondents. In his 10th edition Gay (2009), advocates for researchers in the social science to use 10-30% of the target population to obtain an appropriate sample size for a study. The respondents were organization employees who directly or indirectly interact with the ERP system procurement module, selected purposively from the three functions of the organization; Procurement (30%), Production or Operations (30%) and Finance (30%) through purposive sampling from the five selected manufacturing organizations in Nairobi, Kenya. This has been elaborated more on table 3 below.

TABLE 3

SAMPLE SIZE

Category	Total population	Sample size	Percentage
Procurement	50	15	30%
production	300	90	30%
Finance	50	15	30%
Total	400	120	30%

3.5 Data Collection Instruments and Data Collection Procedure

Data collection instruments are tools used for collecting data during a study (Sow & Sia, 2004). The study used only the questionnaires. Questionnaires were preferred as being economical in as far as data collection is concerned. The questionnaire entailed sections A-F; section A focused on general information while part B-F were structured to measure each of the study objectives namely system control, cost saving, process flexibility and faster process.

The researcher got an introductory letter from the school of business and presented it to the National Commission for Science, Technology and Innovation in order to acquire a research permit. The Managerial Board of the selected organizations was informed on the data collection process due to take place in their organization two weeks prior the actual data collection period. The researcher hired two experienced research assistants who aided in distributing and collecting filled questionnaires from the sample respondents. During the data collection, the researcher observed research ethics as needed. The data of the study was from primary sources which involved the use of structured questionnaire. The respondents was strictly asked to focus on

procurement as a function on system controls, cost savings, process flexibility and faster processes while focusing on ERP systems in bringing efficiency to manufacturing organization.

3.6 Instruments Validity and Instruments Reliability

Mugenda & Mugenda (2003) defines validity as the accuracy and meaningfulness of inferences, which are based on the research results. It defines the degree to which results obtained from the analysis of data actually represent the phenomena. Validity of the questionnaire was enhanced by involving the relevant stakeholders from the procurement, finance and production or operation function. These three functions play a very crucial role in procurement and its efficiency in the manufacturing set-up. Their in-put enhanced validation of the instruments used during research process.

Orodho (2004) defines reliability as the degree to which empirical indicators are consistent across two or more attempts to measure the theoretical concept. Reliability of the instruments was done by testing individuals using similar testing procedures. The researcher tested the research instruments by forwarding at least one questionnaire to the one non selected organization earlier before the actual research was carried out with an intention of identifying any errors in-terms of language and if the questionnaire was well structured to get the required data from the respondents. A test re-test was done on the findings from the same organization using Cronbach's Alpha. A reliability score of 0.75 was obtained making the research instruments more reliable.

3.7 Data Analysis and Presentation Methods

According to Smeeten & Goda (2003) data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and

evaluate data. The researcher collected data quantitatively. The completed questionnaires were edited at first for completeness and consistency before it was processed.

The Statistical Package for Social Sciences (SPSS) version 18 was used in the analysis. The researcher used quantitative data analysis because of accurate results and limited personal bias involved in the analysis (Gay, 2009). Quantitative data was coded, summarized and analyzed using descriptive statistics such as frequencies, distribution tables and percentages. Analysis was done through calculating frequencies, percentages and tabulating them appropriately. It was then presented using frequency tables, graphs and pie charts. ANOVA was used to carry out regression analysis to find out the relationship between the independent variable and dependent variable. In the regression analysis the study used the following model

Equation i $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$

Where; Y is the dependent variable which procurement efficiency

b_0 is the regression constant,

b_1, b_2, b_3 and b_4 are the coefficient of independent variables, referred to as knowledge enablers

X_1 is control systems,

X_2 is cost saving

X_3 is process flexibility

X_4 is faster process.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter is a presentation of results and findings obtained from field responses and data, broken into two parts. The first section discusses the background information of the respondents, while the other sections present findings of the analysis. The study used descriptive and inferential statistics in the analysis and discussed the issues in the best way possible.

4.2 Section A: General Organization Information

4.2.1 Response Rate

Out of 120 questionnaires which had been administered to the interviewees, 88 of them were returned for analysis. This translates to 73 percent return rate of the respondents. Overall, the response rate can be considered to have been very high as shown in Table 4 According to Mugenda and Mugenda (2003) a 50% response rate is adequate, 60% good and above 70% rated very good. This also corroborates Bailey (2000) assertion that a response rate of 50% is adequate, while a response rate greater than 70% is very good. This implies that based on this assertion; the response rate in this case of 73% is good.

TABLE 4
RESPONSE RATE

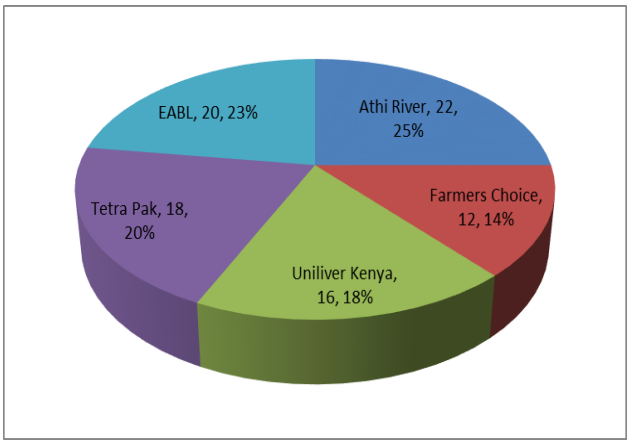
Response Rate	Frequency	Percent
Issued	120	100
Returned	88	73
Not returned	32	27

4.2.2 Organization in the Study

The organizations in the study are shown below. The figure 4 shows the organizations that respondents in this worked, 14 % were of the respondents were from farmers choice, while 23% were from EABL, 18% were form Uniliver Kenya , 25% from Athi river and Tetra Pak comprised of 20%. The respondents attributed to the staff working in the procurement, finance and operations departments in the selected manufacturing organizations. Farmer's choice had the least number of staff respondents (14%) mostly from procurement filling the questionnaires, while Athi River had more staff respondents (25%) offering information in relation to the study objectives.

FIGURE 4

ORGANIZATIONS IN STUDY



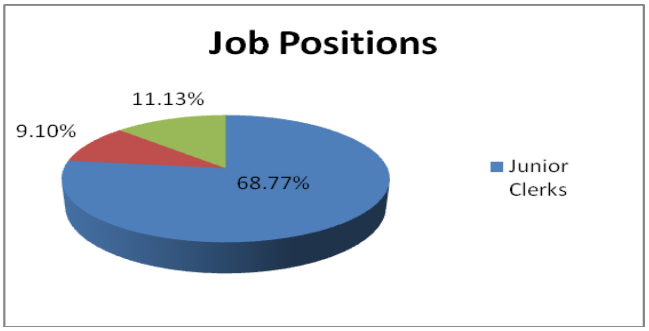
4.2.3 Job Position Held

The study sought to find out which position the respondent held in the organization. The figure 5 below shows the results. Majority of the respondents were junior clerks (68.77%), followed by senior officers who were 11.14% and managers who were 9.10% of the respondents. The manager's response can be attributed to the busy schedule they have in their work schedule

thus, having limited time for data filling. The junior clerks were readily available because of the limited duties they have at work while others were flexible enough to meet after office hours for data filling exercise.

FIGURE 5

JOB POSITION HELD

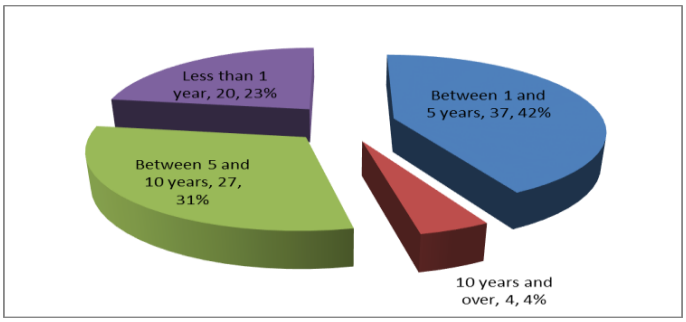


4.2.4 Length of time worked for the organization

The study sought to establish how long the respondents had been working at their respective organizations to ascertain to what extent their responses could be relied upon to make conclusions for the study based on experience. From the study findings as indicated in figure 6, majority (42%) indicated that they had been working at their respective organizations for a period between 1-5 years, 31% indicated they had been working for 5-10 years, 23% for less than 1 year a few (4%) indicated they had been working for a period more that 10 years. It can be noted that the 31% of the respondents were mostly senior officers and managers who had attributed that they had got promotions to senior ranks after working for over five years and had furthered their studies which was a factor promoting the rise in ranks. The 23% of the respondents who had worked for less than a year were procurement officers who had modern IT skills which facilitated efficiency in e-procurement. It can be asserted that employee retention in the manufacturing organizations was poor as only 4% of the respondents had worked over 10 years.

FIGURE 6

LENGTH OF TIME WORKED FOR THE ORGANIZATION

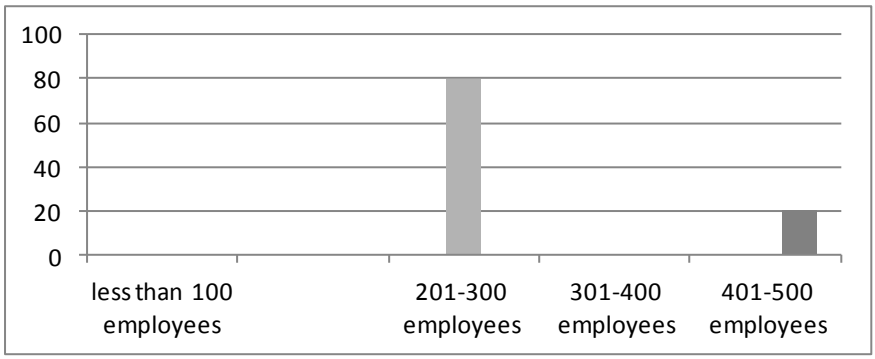


4.2.5 No. of Employees in Organization

The study sought the number of employees from each of the organization in the study. As shown in figure 7 below, 80% of the organizations had employees ranging from 200-300 while 20% of the organizations had employees ranging from 400-500. Of the five organizations selected only EABL had the 20% employee ranging from 400-500. This implies that the market demand for EABL products is more as compared to the products from other organizations.

FIGURE 7

NUMBER OF EMPLOYEES IN ORGANIZATION



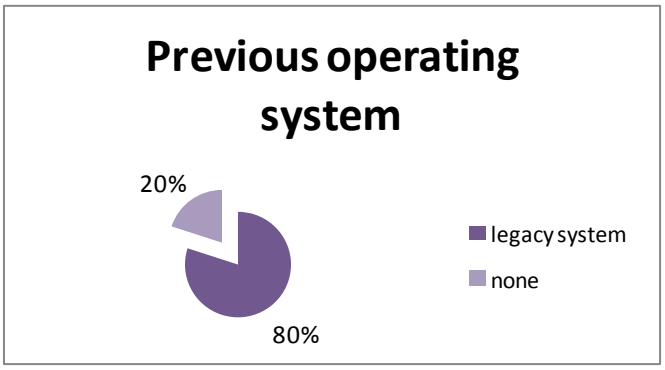
4.3 System Controls in the Organization

4.3.1 Systems used by the Company before ERP Implementation

The study established which systems were used by the company before the ERP implementation. Figure 8 shows the response. Majority (80%) indicated that they used legacy systems while a small no. (20%) indicated that they didn't have any system. Many organizations preferred the legacy system because the operators were familiar with the process and could easily track any data because of continual usage. However, the maintenance and staffing cost of the legacy system are high and growing.

FIGURE 8

SYSTEMS USED BY THE COMPANY BEFORE ERP IMPLEMENTATION



4.3.2 Main challenges the company faced with the old system

The study sought to determine the main challenges faced in the company. The response are shown in the Table 5 below

TABLE 5

CHALLENGES FACED WITH THE OLD SYSTEM

Challenge	Frequency	Percentage (%)
Bloated purchasing department	77	88
Slower and less flexible purchasing process.	68	77
Maverick buying	72	82
Higher clerical and administrative costs	71	81
High process inaccuracy due to very high manual component	75	85
Bigger space required to archive fiscal documentation.	78	89
Less efficient process.	67	76
Could not perform some advanced functions i.e. send orders online, online order receiving and issuing, order acknowledgement and order confirmation to customers.	63	72

As shown in Table 5 above, 88% of the respondent felt that bloated purchasing department, 77% identified slower and less flexible purchasing process, 82% indicated that maverick buying, 81% identified higher clerical and administrative cost as a challenge, 85% of the respondents felt that high process inaccuracy due to high manual component was a challenge in their organizations. 89% identified bigger space required to archive fiscal documentation as a challenge. 76% found less efficient process as a challenge and 72 % indicated that not being able to perform some advance functions as a challenge.

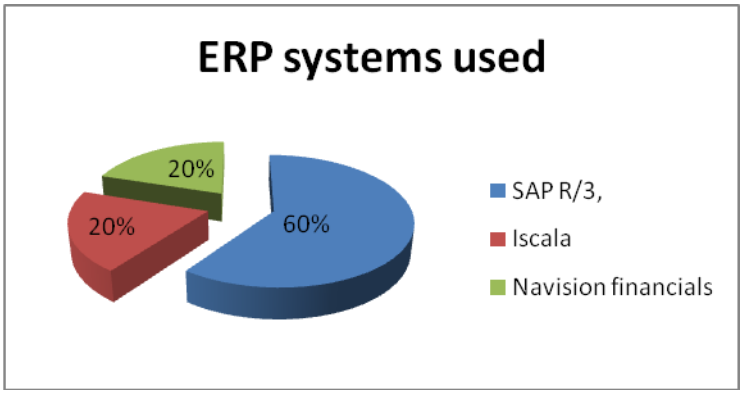
4.3.3 ERP System Used In Your Organization

The study sought to determine which ERP systems the organizations in the study used. The responses are displayed in the figure 9 below; 60% of the organizations used SAP R/3, 20% of the organizations use Iscala and another 20% use Navison financials. This implies that SAP R/3 is the most preferred ERP system by many manufacturing organizations. SAP R/3 also is the

most advanced ERP system in the market currently serving both internal and external stakeholders. Thus, many organizations seem to prefer it.

FIGURE 9

ERP SYSTEMS USED IN YOUR ORGANIZATION



4.3.4 Driving Force for ERP

The study sought to find out the driving force for these organizations to adopt the ERP. The responses are shown in the Table 6 below.

TABLE 6

DRIVING FORCES FOR ERP ADOPTION

Driving force	Frequency	Percentage %
Reduced direct operating cost	70	80
Quickened information response time	76	86
Improved order management/order cycle	82	93
Lowered inventory levels	86	98
Increase interaction across enterprise	72	82
Improved on-time delivery	80	91
Improved cash management	85	97
Improved interaction with suppliers	73	83
Improved interaction with customers	77	88

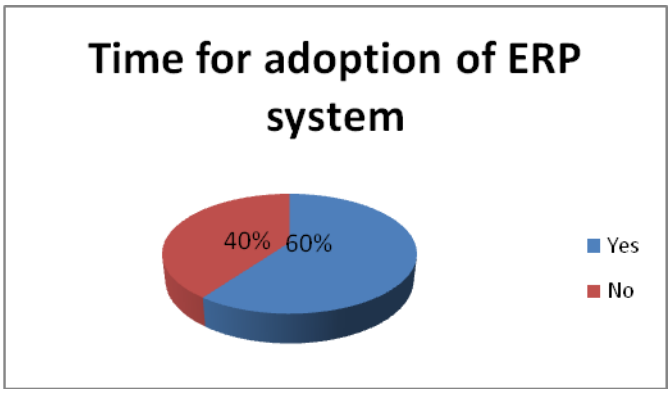
As shown in Table 6 above, 80% of the respondents indicated that reducing direct operation cost was a driving force for the organization, 86% identified quickened information response time as a driving force, 93% indicated that improved order management, 98% identified that lowered inventory levels was also a driving force. The study also found 82% of the respondents felt that it helped increase interaction across enterprise and so making it a driving force, 91% indicated it improved on time delivery, 97% being the highest response on any driving force being on improved cash management. Eighty three percent indicated that it helped in interaction with suppliers and 88% indicated it was driven by the ability to improve interaction with customers.

4.3.5 Time for Adoption of ERP

The study sought to find out whether the adoption happened was finished on time. The figure 10 below shows the response from the respondents where the majority (60%) indicated it was completed on time while 40% responded that it wasn't adopted in time. The 40% attributed challenges like lack of proper analysis of requirements during implementation and thereafter, inadequate training of personnel's and cost overheads. Majority attributed to completion on time due to adequate support from senior management and good investment in infrastructure. The organizations also did a proper analysis of the requirements thus had the essential functionalities. This indicates that absence of senior management support may delay ERP implementation in an organization

FIGURE 10

TIME FOR ADOPTION OFERP

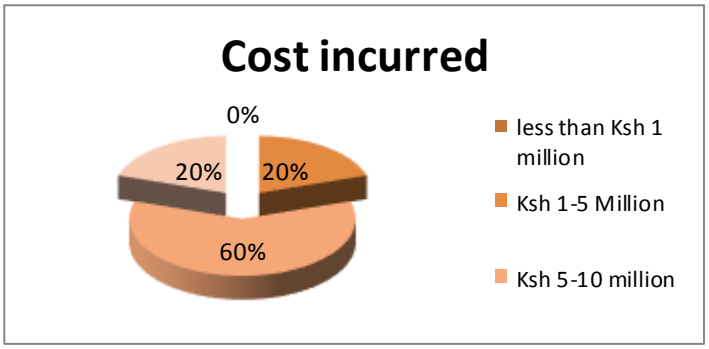


4.3.6 Total Cost of Implementing the ERP System

The study sought to determine the cost of implementing an ERP system in these organizations. The responses are shown in the figure 11. According to the findings 20% of the organization had used cost ranging from Ksh 1-5 million, 60% of the organizations had used a cost ranging from Ksh 5-10 million while 20% had used a cost of over 10 million. This implies that the cost of ERP implementation is high and thus organizations with limited funds may not be able to implement the system. The cost is related to the ERP software's involved, planning, customization and configuration which requires IT experts, testing and the actual implementation.

FIGURE 11

TOTAL COST OF IMPLEMENTING THE ERP SYSTEM



4.3.7 Factors Affecting the Implementation and Adoption of ERP Systems

The study sought to determine which factors affect the implementation and adoption of ERP systems. The results are displayed in the Table 7 below.

TABLE 7

FACTORS AFFECTING IMPLEMENTATION AND ADOPTION OF ERP SYSTEMS

Factors	Frequency	Percentage (%)
Skills and knowledge	78	89
Budgetary allocation	80	91
Top management support	67	76
Firm's size	82	93

As shown in Table 7 above, 89% identified skill and knowledge as a factor affecting the implementation and adoption of ERP systems, 91% indicated that budgetary allocation does affect the implementation of ERP systems, 76% identified top management support as a factor. Lastly the respondents (93%) indicated that firm size does act as a factor affecting the implementation of ERP systems.

TABLE 8

TECHNOLOGICAL FACTORS LEADING TO ERP SYSTEM IMPLEMENTATION

Factors	Frequency	Percentage (%)
IT infrastructure	52	59
Information security risks	22	25
Rapid change of technologies	14	16
Total	**88**	**100**

From the results in the Table 8 above 59% indicated that IT infrastructure did lead to ERP systems, 25% indicated that information security also lead to the implementation of the ERP systems and 16% of the respondents identified the rapid change of technologies.

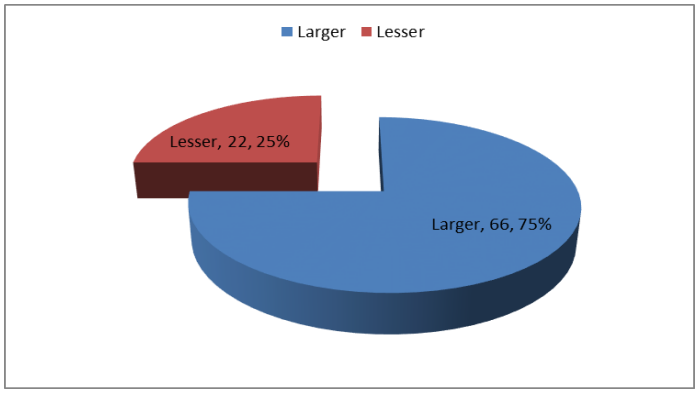
4.4 Cost Savings in the Organization

4.4.1 Extent of Meeting Overall Needs

The study sought to find out the extent in which ERP system meets the overall needs of the organization. The figure 12 below shows how the majority (75%) felt that it met the needs to a larger extent while 25% felt it met to lesser extent. The majority cited that ERP offered complete visibility of all the important processes across various departments, reduced costs of departmental software's, created an automatic and coherent flow from one department to another and some ERP systems like Sap R/3 provided business intelligence functionalities. On the hand however, the 25% of the respondent cited the ERP deployments were highly time consuming and the cost of ERP software, planning and customization were too high. The fact that ERP implementation also made some organizations single vendors lock in limited organizations negotiations of their services.

FIGURE 12

EXTENT OF MEETING OVERALL NEEDS



4.4.2 Savings the Organization Generated In the Adoption of ERP System

The study put several statements to investigate the areas in which the organizations had cost saved. The Table 4.6 below shows statements that aimed to investigate these areas.

TABLE 9
AREAS OF COST SAVINGS

Statement	1	2	3	4	5	Mean	Std DEV
Procurement Cycle	0	0	0	38	62	4.6	0.26
Inventory Management	0	0	0	19	81	4.8	0.32
Contracts Management	0	0	10	29	62	4.6	0.24

The Table 9 above shows that a majority (62%) indicated that there organizations had saved cost in the procurement cycle, 81% indicated a saving cost in inventory management while 62% indicated cost saving in contract management.

4.4.3 Overall Benefits of Using ERP System

The study put several statements to investigate the benefits in which the organizations had acquired in using an ERP system. The Table 4.7 below shows statements that aimed to investigate these benefits.

TABLE 10
OVERALL BENEFITS OF USING ERP SYSTEM

Statement	1	2	3	4	5	Mean	Std DEV
Reliable information access	0	0	0	30	70	4.6	0.24
Delivery & cycle time reduction	0	0	21	40	39	4.8	0.32
Cost reduction	0	0	10	31	59	3.6	0.19
Easy adaptability	0	0	40	29	31	4.15	0.74
Global outreach	0	0	60	35	5	3.85	1.18
E-Commerce, e-business	0	0	0	59	41	4.2	0.77

As shown in Table 10 above, reliable information was the most overall benefit (70%) of the ERP system in the selected manufacturing companies while global outreach had the least (5%) benefit . ERP system reduced costs by 59%, enhanced e-business by 41% contributed to delivery and cycle time reduction by 39% and was easily adaptable by 31%. This implies that ERP systems had benefits across all areas in the organization.

4.4.4 *E-Procurement System Using ERP System Process*

The study sought to find out how the ERP system works in this organization and the response was as follows. Request starts from the customer or user through e-business which is a software fitted to customers linking them with Tetra Pak to be able to: View prices (quotes),

view physical stocks from spare parts stores, view their credit financial status, view order status and follow-up, send orders on-line to Tetra Pak spare parts sale points overseas, receive order acknowledgement, receive out bond deliveries (parking list), and monitor order status (progress) i.e. placed, confirmed and delivered.

Thereafter feeding in requirement in e-business, an order notification followed by an order acknowledgement is triggered in outlook indicating an order received from the customer: Lu (2011) defines an order confirmation as a triggered system based in SAP R/3 generating a unique number to the order which is also sent to the customer on email as a notification as well. In SAP R/3 inbox, any order request without issues was triggered straight in creating an out bond delivery and creating a purchase order. When items are in stock, an out bond delivery is created, and if not, the system automatically created a purchase order to where it is available in Tetra Pak sale points i.e. Tetra Pak Dubai, Tetra Pak Sweden (HQ). This is possible since the entire Tetra Pak sale / buying points are connected in the same data base worldwide:

If items are available, using the out bond delivery produced by the system, the storekeeper / spare parts administrator picks items from the store, confirming with the order out bond delivery then goes to SAP R/3 to generate and produce the out bond delivery. After executing, the system prompts the customer that goods are ready for collection of which an invoice is generated and accompanies the items during collection. A purchase order for the item is created online when items are not in stock. At this point, the purchasing administrator opens the respective purchase orders in SAP R/3 to check for special conditions from the customer i.e. urgency, lead time, delivery terms. This is to enable the purchaser be able to execute those specific special conditions before the order is transmitted to the supplier. Changes can also be on quantities required, on prices, and cancellation of requested items.

Once the purchaser is satisfied that the order is okay, he clicks save and the order is automatically sent to the suppliers and he gets an email notification of the same. The system triggers an order confirmation online after an order is sent and received. This then updates on the order of the dispatch dates against the respective items ordered followed by an out bond delivery. The purchasing administrator can be able to view in SAP R/3 all this information by opening the respective orders. The systems prompts the supplier on email to release items on its date of dispatch, thereafter, a shipping notification is released online followed with an invoice generated immediately on the same date. An invoice notification is also sent on email to the purchasing administrator. It is important to note that if the items are for customers outside Kenya, the items are sent direct to the customer. The purchasing administrator conveys the supply information on email or on phone with details i.e. AWB (Air Way Bill) which shows the delivery details.

On the arrival in the airport, Tetra Pak Purchasing Administrator creates an invoice for the buyer (customer) with Tetra Pak Kenya own terms i.e. local prices which have the mark-up and VAT, which is sent to the customer, then Tetra Pak credit controls follows for payment based on agreed terms and conditions, and at the same time Tetra Pak Kenya pays Tetra Pak Global as per set company group rules. The same process is followed for replenishment of local stocks for selling to customers as per need and request of which goods receipts has to be done in SAP R/3 under MIGO goods receipts to reflect actual stocks received.

4.5 Areas (Modules) of ERP System Coverage

As shown in Table 11 below, the major areas that ERP covered were; customer relationship management (4.7), sales and distribution management (4.7 and production management (4.6). The least covered areas by the ERP system were human resource management (3.7), accounting management (3.6) and financial management (3.6). This implies

that ERP system were more efficient in serving both external stakeholders who are customers and internal stakeholders that is production. However, the internal system like human resource management and accounting management were not adequately covered by ERP as compared to external systems of sales and distribution.

TABLE 11
MODULES COVERED BY YOUR ORGANIZATIONS ERP SYSTEM

Statement	1	2	3	4	5	Mean	Std DEV
Accounting management	0	0	0	37	63	3.6	0.16
Financial management	0	0	0	29	71	3.7	0.18
Manufacturing management	0	0	0	29	62	4.6	0.24
Production management	0	0	0	44	56	3.9	0.18
Transportation management	0	0	0	21	79	4.1	0.22
Sales & distribution management	0	0	0	31	69	4.7	0.05
Human resources management	0	0	0	25	75	3.7	0.18
Supply chain management	0	0	0	34	66	4.1	0.22
Customer relationship management	0	0	0	20	80	4.7	0.05

4.6 Regression of Study Variables

The section below presents a regression analysis of the study variables namely; Control Systems, Cost Saving, Process Flexibility and Faster Process.

TABLE 12

SHOWING MODEL OF SYSTEM CONTROL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.605[a]	.366	.339	.62749

An inverse model was applied in determining the relationship between the effects of system controls of Enterprise Resource Planning and procurement efficiency. Results in table 12 above indicate that the system controls was efficient. This finding was supported by an R Squared of 0.366. An R Squared of 0.366 indicates that 56.6% of variation in system control of ERP affects procurement efficiency.

TABLE 13

ANALYSIS OF VARIANCE OF SYSTEM CONTROL

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.603	1	4.603	10.931	.003[a]
	Residual	9.684	23	.421		
	Total	14.287	24			

Regression results in Table 13 indicate that the inverse of system controls of ERP is positively related to procurement efficiency. This was evidence by a regression coefficient of 0.941 (p value = 0.003). The relationship was significant at 0.05 critical value since the reported p value 0.003 was less than the critical value of 0.05. An increase in system controls of ERP by one unit leads to an increase in procurement efficiency by 0.941 units.

4.6.2 Cost saving

TABLE 14

MODEL OF COST SAVING

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.230[a]	.053	.047	.37300

An analysis was done to determine the relationship between the effects of cost saving of Enterprise Resource Planning and procurement efficiency. Result in table 14 indicates that the cost saving was not effective with regard to procurement efficiency. This finding was supported by an R squared of 0.053.An R squared of 0.053 indicates that 5.6% variation in the cost saving on procurement efficiency. This implies that ERP system was not cost effective with regard to procurement efficiency

TABLE 15

ANALYSIS OF VARIANCE OF COST SAVING

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.282	1	1.282	9.216	.003[a]
	Residual	22.956	165	.139		
	Total	24.238	166			

An Analysis of Variance (ANOVA) results in Table 15 indicates that the overall model was significant. This was supported by an F statistic of 9.216 (p value = 0.003). The ANOVA results demonstrated that the independent variable (cost saving) affected procurement efficiency.

TABLE 16

REGRESSION COEFFICIENTS OF COST SAVING

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.875	.256		11.211	.000
	Cost effectiveness	.212	.070	.230	3.036	.003

Regression results in Table 16 indicate that the inverse cost of ERP system is positively related to procurement efficiency. This was evidence by a regression coefficient of 0.212 (p value = 0.003). The relationship was significant at 0.05 critical value since the reported p value 0.003 was less than the critical value of 0.05. An increase in cost effectiveness by one unit leads to a decrease in procurement efficiency by 0.212 units.

4.6.3 Process flexibility

TABLE 17

MODEL OF PROCESS FLEXIBILITY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823[a]	.685	.635	.36665

Analysis on the effects of process flexibility of Enterprise Resource Planning on procurement efficiency was done. Results in table 17 indicate that the process flexibility was effective with regard to procurement efficiency. This finding was supported by an R squared of 0.685. An R squared of 0.685 indicates that process flexibility of ERP system was 68.5% effective in procurement efficiency.

TABLE 18

ANALYSIS OF VARIANCE OF PROCESS FLRXIBILITY

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.057	1	2.057	15.303	.000[a]
	Residual	22.181	165	.134		
	Total	24.238	166			

Results in Table 18 present an Analysis of Variance (ANOVA). Results indicate that the overall model was significant. This was supported by an F statistic of 15.303 (p value = 0.006). The ANOVA results demonstrated that the independent variable process flexibility affects procurement efficiency positively.

TABLE 19

REGRESSION COEFFICIENTS OF PROCESS FLEXIBILITY

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.928	.186		15.726	.000
	Process flexibility	.893	.050	.291	3.912	.006

Regression results in Table 19 indicate that process flexibility in ERP system affected procurement efficiency in a positive way. This was evidence by a regression coefficient of 0.893 (p value = 0.006). The relationship was significant at 0.05 critical value since the reported p value 0.006 was more than the critical value of 0.05. This indicates that process flexibility in the ERP system enhances procurement efficiency more effectively.

4.6.4 Faster process

TABLE 20

MODEL OF FASTER PROCESS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.912[a]	.832	.882	.36665

Analysis on the effects of faster process f of Enterprise Resource Planning on procurement efficiency was done. Results in table 20 indicate that the faster process was positively effective with regard to procurement efficiency. This finding was supported by an R squared of 0.832. An R squared of 0.832 indicates that faster process of ERP system contributed to 83.2% in procurement efficiency.

TABLE 21

ANALYSYS OF VARIANCE OF FASTER PROCESS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.167	1	3.167	15.303	.000[a]
	Residual	24.181	172	.134		
	Total	27.134	169			

Results in Table 21 present an Analysis of Variance (ANOVA). Results indicate that the overall model was significant. This was supported by an F statistic of 15.303 (p value = 0.006). The ANOVA results demonstrated that the independent variable process flexibility affects procurement efficiency positively.

TABLE 22

REGRESSION OF COEFFICIENTS OF FATSRE PROCESS

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.928	.186		15.726	.000
	Faster process	.973	.050	.291	3.912	.006

Regression results in Table 22 indicate that faster process ERP system affected procurement efficiency in a positive way. This was evidence by a regression coefficient of 0.213 (p value = 0.008). The relationship was significant at 0.05 critical value since the reported p value 0.008 was more than the critical value of 0.05. This indicates that faster process in the ERP system enhances procurement efficiency more effectively.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is a synthesis of the entire study, and contains summary of research findings, exposition of the findings, commensurate with objectives, conclusions and recommendations based thereon.

5.2 Summary of the Major Findings

The following is a summary of the major findings of this study in relation to the study Objectives

5.2.1 *The effect of system controls of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.*

The effects of the ERP system on procurement efficiency are; reduced direct operation, quickened information response time, improved order management and low inventory levels. The system also has increased interaction across enterprise leading to improved time delivery of goods in the manufacturing organizations. There is also increased interaction with suppliers and improved customer interaction. The SAP R/3 system has four transaction blocks which increase

efficiency in payment. The SAP R/3 system is the more advanced serving both external and internal stakeholders, thus increasing procurement efficiency.

According to Kiburi (2008), between the contractors and clients, the ERP systems lead to strength partnering, standardized reporting, a common understanding of terms, opportunities integration, simplification of contract and sharing contractors systems map work process. The control systems of ERP enable an organization to attain its procurement goal by offering decision makers with an enterprise wide view of the information needed. System Controls of ERP manage the flow of goods, information and other resources from the point of origin to the point of consumption. This increases procurement efficiency 9Looman & McDonagh, 2005). This affirms the results indicated in the analysis that system controls had a positive relationship with procurement efficiency.

5.2.2 *The effect of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.*

According to the study findings majority of the organizations (60%) had used a cost ranging from Kshs. 5-10 million in implementation of ERP systems. Only 20% of the organization had incurred a cost of less than 5 million and while 20% of the organization had incurred a cost of over 10 million. This implies that the cost of ERP implementation is too high and only established and large organizations with an employee turnover of over 200 may be able to implement such systems as indicated by the study. The high cost of implementation is highly time consuming and may take up 3 years to get the system completed and fully functional. However, for globally dispersed enterprise companies, the ERP system cuts the cost of decentralized operations by creating a centralized system. The highest cost that ERP saved in the organizations was the cost of inventory management as indicated by 81% of the respondents.

Electronic procurement as such offered in the ERP system automates the manual process of procurement. Automation implies massive savings in cost structure. There are savings in the purchase of non-production goods and services such as office equipment travel cost and computers (Lu, 2011). Automated ERP web based system makes it possible to negotiate better prices with suppliers as the system provides centralized and accurate visibility of the enterprise procurement data. There are benefits in reduction of transaction costs, negotiation costs, contracting costs and coordination costs. Auto-mated e-procurement via ERP systems enables organizations to control and manage purchasing decisions and procurement process. According to Morrison (2009) it implies higher efficiency and more profitable business.

5.2.3 *The influence of process flexibility of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.*

From the findings it was determined that ERP systems were easily adaptable by 31% and had improved e-business by 41%. The SAP R/3 system was flexible as it allowed customer outside Kenya to be served. Customers through the SAP R/3 systems are allowed to place an order online which is acknowledged by the system administrator. The customer through the e-business portal confirms the order which is processed and the product is delivered at any convenient place of the customer's preference. This indicates that ERP enhances process flexibility whereby the customer does not necessarily need to be at the physical place of the product to get it, but can get at his/her convenient place.

Web-based e-procurement system as such offered by the ERP system increase the power of bargaining with suppliers and negotiation of better terms and conditions for companies. Process flexibility is enhanced with ERP e-procurement in that company employees have direct

access to their suppliers system and data. This implies that employees are able to see perceive differentiate technical specifications, product description, product pictures plus price information (Katana. 2011). It thus makes it possible for organizations to pursue more complex information exchange with the supplier and improve supplier relationships. At the same time flexibility is enhanced in that employees have a variety of suppliers to select from (Burns, 2009).

5.2.4 *The effect of a faster process of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.*

It was determined that ERP systems has come out to be the best tool in coordinating and integration of organizations procurement processes due to its ability in processing information faster, track orders and inventory control, automation of orders and payments processes, lowering of set-up costs, reduction of order cycle, avoidance of data duplication in the procurement system module. All departments were easily harmonized under the ERP system and the findings indicate that the system covered more than 50% of accounting, productions and procurement. The systems of ERP offer better company-wide visibility facilitating faster collaboration across all the departments thus increasing communication process and enhancing faster process.

Faster process can be enhanced through internal process efficiencies and automation. Internet based technologies enable faster and more effective operational purchasing processes. This assists the employees of purchasing department in letting them focus more on strategic functions. According to Burns (2009), faster process in ERP system brings simplifications to the materials procurement. As a result operational workload of buyers is reduced because the operational procurement process is decentralized. Companies attain process savings by moving

away from paper based systems to electronic solutions. This is because electronic solutions facilitate electronic orders, invoice and payment; they also have fewer errors in transmission (Hardcastle, 2011). The faster process of ERP thus increases procurement efficiency by bringing more availability to business and at the same time lower process lead times (2009).

5.3 Discussions of findings

The study findings indicated that ERP process had met 75% of the organization needs making the procurement system more efficient. The most covered area in the ERP was the customer relation management (80%). This implied that both the internal and external customers' needs had been well taken care of by the system leading to a faster process in the procurement. The fact that also that ERP system scored highly as a reliable information access tool contributed to improved communication and timely delivery of goods and services in procurement.

5.4 Conclusions

Based on the findings of the study the following conclusions are made:

5.4.1 The effect of system controls of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.

The study concluded that ERP enables companies to break down traditional organization's granaries. They have replaced them with a tightly integrated horizontal structure whereby the strategy, culture of the organization, process and technology are tightly aligned. By using integration technologies to integrate management of document activities, human resource intervention is only necessary in activity control (Davis and Leonard, 2006). Also, spending

control increase, supplier transparency, procurement activities decentralization and rationalization of supply base is evident. Quality information availability and integration of procurement with other business processes has facilitated controls in the manufacturing business processes.

5.4.2 ***The effect of cost saving of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.***

The study concluded that ERP systems had reduced cost in operation and also time used to perform certain duties in the organization. The study however found that the implementation cost of the ERP system was too expensive with the least company spending a cost range of Kshs. 1-5 million. These findings concur with Mutongwa & Kefa (2011) who posited that the affordability of proprietary ERP systems for SME's was a problem hindering them from implementing the ERP system.

5.4.3 The influence of process flexibility of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.

The study concluded that Electronic procurement in the ERP system in the organization increased efficiency in the organizational structure, especially in the reduction of procurement department size and levels and of the number of functional areas involved in the purchasing process. This means that the process becomes flexible and more agile; costs are lower and service to final customers higher (Garrido *et al.,* 2008). According to Annamalai & Ramayah (2011), ERP system has significantly increased flexibility in information provision and improved decision making in procurement function.

5.4.4 ***The effect of a faster process of Enterprise Resource Planning on procurement efficiency in selected manufacturing firms in Nairobi.***

The study concluded that ERP systems had come out to be the best tool in coordinating and integration of organizations procurement processes due to its ability in processing information faster, track orders and inventory control, automation of orders and payments processes, lowering of set-up costs, reduction of order cycle, and avoidance of data duplication in the procurement system module. Faster Process was evident in areas of purchase orders and purchase request approval and the overall document management, whereby it is done online the moment documents are keyed in and saved in the system. This concurred with Burns (2009) who posited that ERP systems have different **modules** available like Marketing/Sales, Finance/Accounts, CRM, Human Resource Management, Manufacturing, Supply Chain/Warehouse Management and Project Management enhanced a faster process in the activities of an organization.

5.5 Recommendations

The study recommends the following:

a) In relation to the effect of system controls of Enterprise Resource Planning, the study recommends that the top management should provide the necessary resources in terms of leadership, financial support and provision of expertise in order for implementation of ERP to be successful. Top management may also be involved to monitor and evaluate the implementation process from time to time in order to determine the success and areas to improve on after the assessments in order for implementation to be successful. This was because implementation of

the ERP system in some organizations was challenged by inadequate support from top management and inadequate infrastructure.

b) With regard to the effects of cost saving of Enterprise Resource Planning, the study recommends for an alternative ERP system which is cost friendly. The current systems are implemented by organizations with over Kshs. 1 million. This will enable SME's implement the system because it give a competitive advantage.

c) Regarding process flexibility of Enterprise Resource Planning on procurement, the study recommends adoption of electronic procurement as it increased efficiency in the organizational procurement process, especially in the reduction of procurement department size and levels and of the number of functional areas involved in the purchasing process.

d) Finally in regard to the effect of a faster process of Enterprise Resource Planning, the study recommends that organizations should embrace technological changes that are rapidly changing on the environment that the organization exists. This was evident with the effects of ERP on timely delivery of products, improved customer relationship and was a reliable information system.

5.6 Areas of Further Study

Based on the findings the following areas have been suggested for further study:

a) A study on the effect of enterprise resource planning (ERP) systems on procurement efficiency in other industries as this study only focused on manufacturing industry. There is need to carry out a similar study on service based organizations so as to effectively understand how the ERP system affects procurement efficiency with regard to non-tangible products.

b) The impact of globalization of ERP efficiency in organizations. This is because the respondents indicated that ERP contributed 5% in the global outreach. Majority of the

respondents asserted that globalization had minimal influence on the adoption of the ERP systems. Although this is an indicator that the local market is very competitive, hence the search for ERP, there is the need to assert this assumption

c) The impact of Enterprise Resource Planning on organizational performance. While some organizations had a positive impact of implementing the ERP system, others had a negative impact (Maina, 2009). At the same time other performance indicators like Total Quality Management have shown to affect procurement positively. Thus, the need to assess the overall impact of ERP system in relation to organizational performance

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APPENDICES

APPENDIX 1

QUESTIONNAIRE

Kindly fill the questionnaire and tick where appropriate. The information provided will be treated with utmost confidentiality and it is for academic purposes only.

Section A: General Information about the Organisation and the Respondent

1. What is the name of your organization?

   ---

2. Job title in the Organization? *(Optional*)

   ---

3. What is your position in your organization?

   Manager ☐

   Senior Officer ☐

   Junior Clerk ☐

4. What type of manufacturing firm is your organization?

   Packaging material ☐

   Alcohol Beverages ☐

   Non alcoholic Beverages ☐

   Food Products ☐

   Others *(Please Specify)* ☐

   ---

5. For how long have your organization been in existence in Kenya?

   Less than 1 year ☐

   ☐

Between 1 and 5 years

Between 5 and 10 years ☐

10 years and over ☐

6. For how long have you worked for the organization?

Less than 1 year ☐

Between 1 and 5 years ☐

Between 5 and 10 years ☐

10 years and over ☐

7. How many employees does your organization have?

Less than 50 employees ☐

51 – 200 employees ☐

201 – 400 emplyees ☐

above 400 employees ☐

Section B: System Controls in the Organization

8. What systems was the company using before ERP implementation?

Legacy systems ☐

None ☐

9. What two main challenges did the company face with the old system?

i. Bloated purchasing department ☐

ii. Slower and less flexible purchasing process. ☐

iii. Maverick buying ☐

iv. Higher clerical and administrative costs. ☐

v. High process inaccuracy due to very high manual component. ☐

vi. Bigger space required to archive fiscal documentation. ☐

vii. Less efficient process. ☐

viii. Could not perform some advanced functions i.e. send orders online, online order receiving and issuing, order acknowledgement and order confirmation to customers. ☐

10. What ERP system is your organization using?

SAP R/3 ☐

Oracle ☐

Ariba ☐

Others *(Please specify)* ☐

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11. What was the driving force in terms of benefits motivated your firm to adopt ERP system in your organization? Tick the ones affecting your firm:

Reduced direct operating cost	
Quickened information response time	
Improved order management/order cycle	
Lowered inventory levels	
Increase interaction across enterprise	
Improved on-time delivery	
Improved cash management	
Improved interaction with suppliers	
Improved interaction with customers	

Others *(Please specify)*

---

12. Was the project of adopting ERP system in your organization completed on time?

    Yes ☐ No. ☐

    If No, for how long did it delay? *Please Specify*_____

13. What was the total cost of implementing the ERP System you are using?

    Less than 1 mioKes ☐

    1 mio – 5 mioKes ☐

    5 mio – 10 mio Kes ☐

    above 10 mio Kes ☐

    Others *(Please specify) Kes.*_____

14. Did the actual budget of ERP implementation exceed the planned budget?

    Yes ☐ No. ☐

    If Yes, by what estimate did it exceed? *Please Specify*_____

15. From the following organizational and relational factors, tick the ones that mostly affect the implementation and adoption of ERP Systems in procurement functions.

    i. Firm's size ☐

    ii. Budgetary allocation ☐

    iii. Top management support ☐

    iv. Skills and knowledge ☐

    v. Others*(Please Specify)* ☐

---

16. Choose the technological factors that lead to ERP System implementation.

i. IT infrastructure ☐

ii. Information security risks ☐

iii. Rapid change of technologies ☐

Section C: Cost Savings in the Organization

17. To what extent has the ERP system met the overall needs of your department?

Larger ☐ Lesser ☐

18. What savings has your organization generated in the adoption of ERP System?

---

19. Which of the following areas of cost savings is your organization focusing brought about by the use of ERP System?

Please us the scale below to rank your opinion. 1 – Not at all; 2 - to a less extent; 3 – to a moderate extent; 4 – to a great extent; 5 - to a very great extent.

Areas of Cost Savings	**1**	**2**	**3**	**4**	**5**
Procurement Cycle					
Inventory Management					
Contracts Management					

Others *(Please Specify)*					

---

20. What are the overall challenges of using ERP system in your organisation?

Section E: Process Flexibility

21. Which are your organisations ERP system approaches?

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22. In your opinion do you think the use of ERP systems has any benefits on the following areas?

Please indicate your choice of answer to the question by marking the preferred box.

Areas of Benefits	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Reliable information access					
Delivery & cycle time reduction					
Cost reduction					

Easy adaptability					
Improved maintenance					
Global outreach					
E-Commerce, e-business					

Other *(Please Specify)*

Section F: Faster Process

23. Describe your e-procurement process using the ERP system in place.

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24. Which of the following areas (modules) does your organizations ERP system cover?

Please us the scale below to rank your opinion. 1 – Not at all; 2 to a less extent; 3 – to a moderate extent; 4 – to a great extent; 5 to a very great extent.

Areas (ERP Modules)	**1**	**2**	**3**	**4**	**5**
Accounting management					
Financial management					

Manufacturing management					
Production management					
Transportation management					
Sales & distribution management					
Human resources management					
Supply chain management					
Customer relationship management					

Thanks for your co-operation.