

**INFLUENCE OF ENTERPRISE RESOURCE PLANNING ON THE EFFECTIVENESS
OF THE SUPPLY OF ESSENTIAL DRUGS IN GOVERNMENT HOSPITALS IN
KENYA: A CASE OF KENYA MEDICAL SUPPLIES AGENCY**

BY

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DECLARATION

This project is my original work and has not been presented to any other examination body.

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Date. 4/11/2012

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Declaration by the Supervisor

This research project has been submitted for approval with my approval as the university supervisor.

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DEDICATION

I dedicate this study to my wife Irene, the mother of my children for all the support she have offered me during the period of preparing for this study. I spent many nights and weekends preparing this report hence forfeiting the times we would have gone out for leisure. I also dedicate this project to my children Diana, Sharon, Brenda, Larry and Andrew, I never had enough time to care or show you more fatherly love. I believe the Almighty God blessed you abundantly and compensated you for the time I missed being with you.

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LIST OF ABBREVIATIONS AND ACRONYMS

ARV	Anti-Retroviral
CSO	Customer Service Officer
DC	Distribution Center
ERP	Enterprise Resource Planning
ICT	Information, Communication, Technology
IT	Information Technology
KEMSA	Kenya Medical Supplies Agency
MEDS	Missions for Essential Drugs & Supplies
MOF	Ministry of Finance
MOH	Ministry of Health
MOMS	Ministry of Medical Services
MOPHS	Ministry of Public Health and Sanitation
MRP	Material requirements planning
RDC	Regional Distribution Center
RHC	Reproductive Health Commodities
SCM	Supply Chain Management
SDPs	Service Delivery Points
SPSS	Statistical Package for Social Sciences
USAID	United States Agency for International Development
WHO	World Health Organization

ABSTRACT

According to the Government of Kenya Economic Survey (2006), Kenyan populace continues to suffer deaths due to shortage of medication in public hospitals. In addition, there have been reported cases of drug expiry, damages, and poor storage practices of drugs in some public hospitals resulting in wastage. This raises issues of effectiveness and efficiency in distribution, demand accessibility and the entire management of drug supply chain in public hospitals. The main objective of this study was to establish the effects of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya with reference to KEMSA. The study used descriptive research design. The target population was 175 employees and the researcher used census method since the population size was small. In this study the researcher employed a questionnaire as the instrument of data collection. The researcher used descriptive statistics and integrates both the qualitative and quantitative techniques in the data analysis. The study concludes that ERP to great extent reduce the cycle time, leads to development of organizational strategies, and improves in information flow and increase operational efficiency. The study concludes that ERP has improved the effectiveness of supply of essential drugs in government hospitals in Kenya. The study recommends KEMSA to continue applying ERP system in its' day to day activities in order to enhance effectiveness of Supply of Essential Drugs in Government Hospitals. The researcher further recommends other organizations to embrace ERP in their major functions in order to achieve effectiveness and efficiency, reduce cycle time, develop organizational strategies, improve information flow and increase operational efficiencies.

CHAPTER ONE

INTRODUCTION

1.1 Study Overview

This chapter comprises of the background of the study, the profile of Kenya Medical Supplies Agency, the statement of the problem, both the general and specific objectives of the study, the significance, the scope and limitations of the study

1.2 Background of the Study

Enterprise Resource Planning (ERP) is an industry term for the broad set of activities that helps a business to manage the important parts of its business. The information made available through an ERP system provides visibility for Key Performance Indicators (KPIs) required for meeting corporate objectives and goals. ERP software applications can be used to manage product planning, purchasing, inventories, interacting with suppliers, providing customer services, tracking orders and deliveries. In most times ERP can also include application modules for the finance and human resources aspects of a business. Typically, an ERP system uses or is integrated with a relational database system (Haag, *et al*, 2006).

At the core of ERP is a well managed centralized data repository which acquires information from and supply information into the fragmented applications operating on a universal computing platform. Information in large business organizations is accumulated on various servers across many functional units and sometimes separated by geographical boundaries. Such information islands can possibly service individual organizational units but fail to enhance enterprise wide performance, speed and competence. In order for a software system to be considered ERP, it must provide a business with wide collection of functionalities supported by features like flexibility, modularity & openness, widespread, finest business processes and global

focus. Kleijnen (2003) argues that the key objective of an ERP system is to integrate information and processes from all functional divisions of an organization and merge it for effortless access and structured workflow. The integration is typically accomplished by constructing a single database repository that communicates with multiple software applications providing different divisions of an organization with various business statistics and information.

It is postulated that Enterprise Resource Planning (ERP) has been used to solve a number of problems that have plagued large organizations in the past. At the same time, it is not without a number of disadvantages. Being able to weigh the two will allow a company to decide if this solution will properly meet their needs. Perhaps one of the most important advantages of ERP is its accounting applications. It can integrate the cost, profit and revenue information of sales that are made, and it can be presented in a granular way. Enterprise resource planning can also be responsible for altering how a product is manufactured. The company to keep better track of their products, and it can allow the products themselves to be produced with higher level of quality. Another area where ERP can be an indispensable tool is the area of security. It can protect a company against crimes such as embezzlement or industrial espionage (Mentezer, 2001).

According to Radford (2001) moreover, the effect of actual and perceived responsiveness on user willingness to adopt the new system is mediated through user beliefs about the correctness of the configuration. Measuring the benefits from an enterprise system is a difficult task, particularly when the benefits of these systems are strategic in nature. Understanding the value of an ERP system entails examining the amount of duplicated effort that the ERP system eliminates and the increased efficiency that results from having an ERP solution in place. Savings can be derived from a reduction in staff numbers and productivity improvement. ERP helps companies control

their purchasing, inventory, manufacturing, finance, and human resource activities by centralizing information collected from dispersed geographical sites.

To understand the effect of an ERP system on the competitive strategy of the organization, one needs to know the factors that offer competitive advantage to any company. The competitive strategy of a company aims at delivering the desired value by evaluating and implementing the decisions taken. This is done to gain an edge over the competitor in the market. One such factor is the improvement in the customer services. The customer is the main focus of any business and improvement in responsiveness to the requirements of the customer is important. Ohno (2000) indicates that an ERP system affects the strategy by streamlining the information of all the functional departments. It provides for customer service and feedback process. The accurate and timely information made available by the ERP system aids the management to take right actions and timely decisions. If the information provided is not correct, the decisions based on that will not be effective and the strategy formed based on that would not work. With an ERP system in place, the information provided would be accurate and relevant in order to make the right strategy. This data is available readily at anytime and thereby it enhances credibility. The effect of an ERP system on the competitive strategy of the organization can be seen as the system aids the company to stabilize its business and develop. It provides a competitive edge by integration of the business units. This process aids in identifying the departmental budgets and achieve targets of sales (Chuang, 2005).

There are no delays in the accounting system and no errors too. The ERP automation process helps reduce the hidden expenses of data maintenance. It also reduces repetition of data entry and instead offers accurate data. Mentzer (2001) suggests that organizations can also save their costs

of managing various units located at different locations. This is one of the effects of an ERP system on the competitive strategy of the organization as it helps to manage the various units easily and in a timely manner. Even if the branches are located across different countries, the multi currency and multi language feature of the system provides a competitive edge. Therefore it is easy to manage multiple units across the borders.

The ERP system has an effect on the competitive strategy of the company by improving the cash flow. This way the company is able to prevent costs on storage of stocks by paying immediately for the raw materials obtained. Inventory is always up to date and the invoices can be quickly generated whenever the need arises. This enables the company to plan for the future in a better fashion. By implementing an ERP system, the business saves on expenses and time which offers a competitive edge. The system centralizes the business data which help to provide real time information available at all times. It enables data to become visible across the whole company by integration. This allows for optimization of the inventory and matching purchase orders. Decisions can be made with minimum errors and more quickly. All these features and advantages are the effect of an ERP system on the competitive strategy of the organization which provides the company to have an edge over its competition in the market (Kouvelis, 2000).

The Kenya Medical Supplies Agency (KEMSA) is a state corporation established by legal notice under CAP 466. It is specialized medical logistics provider for the ministries of medical services and public health supported health facilities and programmes. It was formed in 2000 as a result of recommendations of health stakeholders' forum dubbed 'Strategies for reforming the drug and medical supplies in Kenya. KEMSA works to supply the public health facilities with the right quantity and quality of drugs and medical supplies at the best market value. Its' vision is to be

the leading supplier of quality and affordable essential medical commodities to health facilities in Kenya. KEMSA core values include: visionary leadership, focused customer care and innovation among others.

As envisioned in the National Health Strategic Plan, KEMSA is to ensure the “right quantity and quality of drugs and medical supplies including laboratory reagents” are available to Public Health Facilities at affordable prices. KEMSA has gone along way in addressing the past challenges through its supply chain management system.

Its corporate mission hinges on its ability to maximize efficiencies in the procurement, warehousing and distribution of medicines to Public Health Facilities. KEMSA’s performance is gauged by how well the agency is able to provide efficacious drugs and medical commodities at value-for-money prices to the tax-paying public. KEMSA sources products and services in accordance with Public Procurement Act whose major thrust is to foster accountability and openness in use of public resources.

1.3 Statement of the Problem

Organizations that have implemented the Enterprise Resource Planning Systems have managed to experience efficiency in work processes. There are also significant effects for successfully implementing an ERP system. Organizations often incur more costs for the lack of IT systems than they would have paid for improved systems. They carry excess inventory or provide poor customer service, for instance an organization may invest in ERP without gaining the benefits because the systems are partially implemented, unsuccessfully implemented, or usage deteriorates over time.

According to the Government of Kenya Economic Survey (2006), Kenyan populace continues to suffer and eventually die from shortage of medication in most public hospitals. The irony is that despite the fact that most public hospitals face acute shortage of medications, there have been reported cases of drug expiry, damages, and poor storage practices of drugs in some public hospitals resulting in wastage. This raises issues of effectiveness and efficiency in distribution, demand accessibility and the entire management of drug supply chain in public hospitals. One of the reasons cited by the Ministry of Health for drug shortage in public hospitals is the enormous cost associated with the procurement and distribution of drugs and associated medical equipment (Gwatkin, 2006).

A survey done by Strengthening Pharmaceutical Systems (SPS) Program in 2008 recorded high levels of stock outs of essential drugs and other medical equipment especially in District Hospitals and dispensaries in most parts of the country (SPS report, 2008). The survey showed that wide stock outs had been experienced over time in the country. In this survey, poor inventory management coupled with other logistical inefficiencies in the supply chain was evident. The widespread occurrence of drug expiries experienced in the public hospitals chemists signaled a very urgent need for efficient inventory management and an assessment of the entire integrated supply chain against the backdrop of limited supplies, and widespread stock outs.

A report by Kenya Medical Supplies Agency (KEMSA) taskforce noted poor coordination and disconnect between the procurement function and other functions such as distribution and warehousing of drugs and other medical supplies. This report also noted that there was drug procurement, distribution and warehousing strategies that do not seem to have any linkages or seek synergies with each other (KEMSA taskforce report, 2008). It is against the backdrop of the

above information that the study was designed, so as to ascertain the actual effectiveness of ERP in supply of essential drugs in government hospitals by KEMSA

1.4 Purpose of the study

The purpose of this study was to establish the effect of enterprise resource planning on the effectiveness of the supply chain. A single case- study of KEMSA was selected for the research. The study aimed at bringing out benefits of ERP in relations with effects on supply chain management. This study can be relevant to other agencies in the sense that they can use this study to come up with better approaches of carrying out procurement, warehousing and distribution activities.

1.5 Objective of the study

The following are the objectives that guided this study:

The main objective of this study was to establish the effectiveness of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya with reference to KEMSA. Other objectives that lead this study were:-

- i. To establish the influence of reduction of cycle time as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya
- ii. To establish the influence of development of organizational strategies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya
- iii. To evaluate the influence of improvement in information flow as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya
- iv. To examine the influence of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya

1.6 Research Questions

The study research was based on the following questions:

- i. To what extent does reduction of cycle time as result of ERP influence the Effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?
- ii. How does the development of organizational strategies as result of ERP influence Effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?
- iii. How does the improvements in information flow as result of ERP influence Effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?
- iv. To what extent do operational efficiencies as result of ERP influence Effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?

1.7 Significance of the Study

This study can be useful for any organization intending to modernize ICT. Implementation of ERP brings in more positive effects as they can be in a position to establish some of the areas that have been experiencing difficulties in executing proper responsibilities related to effective procurement, warehousing and distribution of supplies. The highlighted issues can be used to define way forward that would enhance adopting of good distribution strategies enhanced by the adoption of ERP systems.

Since this case study is a government body, it can enable the government to position itself to establish ways in which it can ensure transparency, accountability, effective monitoring and regulation of medical supplies in hospitals products so that these products can reach the intended suffering patients on time and in good quality and quantity. This can only be achieved if the

government is in a position to adopt various recommendations that would be put across on the reasons as to the effect of adopting ERP.

This study can be relevant to other supplies agencies in the sense that they can be in position to use this study to come up with better approaches of carrying out procurement, warehousing and distribution activities. Such organizations may be using outdated supply chain strategies without modern management computerized systems such as ERP, hence those processes that may not be working out well. It was appropriate for them to adopt this study's recommendations and conclusions that were made.

1.8 Limitations of the Study

Limitations to this study involved several factors of which the following are more pronounced: The inability of the respondent to answer research questions appropriately. There was also fear of respondents not cooperating. Some of them did not comprehend the importance of this study, hence refusing to participate. Finally limitations of the research strategy and the problems of research quality posed a challenge to the researcher.

1.9 Delimitation of the Study

The purpose of this study was to establish the effect of enterprise resource planning on the effectiveness of the supply chain management of essential drugs in government hospitals in Kenya. The location of this study was accessible as it was at KEMSA headquarters located along Commercial Street in Industrial Area Nairobi, Kenya. The instruments of the study were questionnaire formulated by the author hence making monitoring and control of the study feasible. Data collection and analysis was done using computer applications such as SPSS. Participants in this study included the target population of the permanent employees of KEMSA who are totaling up to 175 in number.

1.10 Assumptions of the study

The researcher experienced some challenges related to information confidentiality as perceived by the firm under study. The assumption that respondents provide all information required by researcher and not without withholding any crucial information related to the study. The researcher used this study specifically for education purpose only and no part of the provided information may be used for other unlawful purposes.

1.11 Definition of significant terms

The following are some the terms used in this proposal of the study:

Cost Reduction: Improved planning and scheduling practices typically lead to inventory reductions. This provides not only a one time reduction in assets but also provides ongoing savings of the inventory carrying cost, handling, obsolescence, insurance, taxes, damage, and shrinkage.

Customer Satisfaction: This is "the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals.

Inventory management: Inventory management is the process of efficiently overseeing the constant flow of inventory (supplies of essential drugs in Government hospitals) into and out of an existing inventory system. This process usually involves controlling the transfer in of supplies in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the organization into jeopardy. Competent inventory management systems also seeks to control the costs associated with the inventory, both from the perspective of the total value of the goods included and the costs generated by the cumulative value of the inventory.

Enterprise Resource Planning: Enterprise resource planning or ERP is a process which integrates all the functions of its various departments into one computer based system. This system serves each department's needs and ensures that all the departments in a company function efficiently.

Lead Time: Lead time is the time taken from the moment the customer places an order to the moment it is received by the customer. Lead time clock starts when the request is made and ends at delivery. Lead time is what the customer sees. This is the time from ordering of raw materials through to customer delivery.

Information Technology: Is a broad concept that is the branch of engineering that deals with the use of computers and telecommunications to store, retrieve and transmit information.

Cycle Time: Cycle time starts when work begins on the request and ends when the item is ready for delivery. Cycle time is a more mechanical measure of process capability. Cycle time is measured from the time that an article enters the plant, through transformation, to inventory holding, all the way until it reaches the customer. $\text{Cycle time} = \text{processing time} + \text{wait time}$.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is a review of relevant literature which is considered necessary in helping to understand the research study. It addresses critical review and highlights the identified gaps. This chapter reviews what other scholars have done on ERP study; this will help the researcher to establish the research gap which has been covered by other scholars. This chapter covers the benefit of ERP, effect of ERP on performance and it has also discusses the various variables.

2.2 Evolution of Enterprise Resource Planning

Enterprise resource planning systems (ERPS), also known as ERP, is a standardized software package intended to assimilate multiple departments' information technology needs into one cohesive unit. There are many definitions for ERP, for instance the American Production and Inventory Control Society defines ERP as: "a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution, or service company" (Morell, p.2, 2005). ERP gained its popularity in the 1950s and 1960s because of the introduction of computers into the business world. Initially ERP systems were designed to automate tedious tasks such as bookkeeping, invoicing, and reordering. Inventory systems and bill material processors evolved into material requirements planning (MRP) hence the integration of multiple disciplines into cohesive information systems gradually throughout the late 20th century. Research shows that ERP systems were embedded in products such as SAP R/3 and many other applications from J.D. Edwards, Baan Oracle, and PeopleSoft (Morell, 2005).

Today, more ERP system analysts have business backgrounds as well as technical backgrounds leading to the ERP systems gaining popularity due to the emphasis on integrating technology to business processes (Wieder, 2006). It can be said that the research on ERP systems is not up-to-date because of the complexity of developing successful ERP systems. However research shows that Companies that can effectively utilize technology, globalization, and strategic partners can gain a competitive advantage over their competitors (Nah, 2004). Most organizations utilize e-business practices for their everyday activities. E-business is known as the use of Internet technology to perform business operations on the Internet. E-business contains three main components, which are enterprise resource planning, supply chain management, and e-commerce. An ERP is intended to transform business processes into flexible and responsive entities. These transformed processes are built to access multiple departments to reduce duplication and increase efficiencies throughout the whole organization (Chuang, 2005).

2.3 Enterprise Resources Planning (ERP) benefits

Over the years organizations have been striving to realize benefits of ERP and information technology (IT) investments. Botta-Genoulaz and Millet (2006) summarized the motivations for adopting an ERP system from an operational aspect as follows: poor or uncompetitive business performance, cost structure too high, not responsive enough to customers or suppliers, complex, ineffective business processes, inability to support new business strategies, business becoming too global, and inconsistent business processes. Several researchers have classified the types of ERP benefits. Irani and Love (2001), basing on the work of Harris (1996), proposed a framework for the challenges associated with categorizing benefits. In a case study of an MRP II investment, it was observed that, as one moves from strategically oriented IS projects through tactical to operationally oriented projects, the benefits accrued go from those that are generally intangible

and non-quantitative in nature to more tangible and quantitative ones for the nature of strategic, tactical and operational benefits. Kamhawi (2008) also highlighted the benefits, motives, and barriers of implementing ERP systems. However, for those who have not experienced these practices before, the study investigated the reasons for not implementing these systems. Stratman and Roth (2002) proposed an integrated conceptual model of ERP competence, which was defined as a model that comprise several organizational aptitudes and functions, including strategic planning, executive commitment, project management, IT skills, business process skills, ERP training, change readiness and learning.

They argued that a firm's ERP competence must be used effectively in order to truly harness the capabilities of an ERP system for gaining a competitive advantage. B'urcaet al. (2005) argued that managers embarking on extended ERP should consider the following challenge: business processes, whether internal or external, must be examined and redesigned as necessary to take advantage of the new technology. Biehl (2005) also found a major effect on the choice of internal versus external functionality to increase the firm's supply chain capabilities. Shang and Seddon (2000) provided a comprehensive framework of the benefits of ERP systems. They found that all organizations derived benefits from at least two of the five categories: IT infrastructure, operational, managerial, strategic and organizational benefits.

The different classification of ERP benefits revolve around business process, IT infrastructure or technical items, and strategic planning. Stratman and Roth's (2002) conceptual model of ERP competence can serve as a useful framework for evaluating the benefits of ERP systems. However, this framework does not link the competence to managerial and IT infrastructure competence as recommended by Harris (1996) and Shang and Seddon (2000). Both discussions

by B'urcaet al.(2005) and Biehl (2005) on the benefits categories also are less about strategic considerations. Davenport and Brooks (2004) point out that there are different types of benefits from an ERP system and some benefits are likely to arise earlier than others. However, this research is interested in the relationship between benefits of ERP systems implementation and its effects on firm performance of SCM. This study believe that the integration of Harris's (1996) with Shang and Seddon's (2000) benefits models might be the most appropriate technique for evaluating the benefits of ERP system since they emphasized on the importance of gathering information from all employment levels.

2.4 Supply Chain Management

Supply chain management is defined as, the management of upstream and downstream relationships with suppliers and customers to deliver secure customer value throughout the whole supply chain (Moller, 2005). Supply chain management is a complex system that entails extreme coordination between suppliers, manufacturers, and distributors. Entities that form a supply chain desire to create seamless flow of raw materials and information to all departments and end users (Chuang, 2005).

Channeling internal business processes to create an effective supply chain is crucial for most businesses. MRP systems standardized some of the supply chain processes, but companies realized that perpetual structural changes were needed in supply chains. Many executives believe that ERP improvements for the supply chain could hinder progress in supply chain management. However, these same executives acknowledge the need for further integration of activities between suppliers and customers (Nah, 2004).

2.5 Firm Performance of Supply Chain Management

A major challenge to empirically demonstrate the SCM performance concerns how to measure supply chain “success.” Supply chain performance must certainly incorporate financial measures, but should also include broader measures. Closs and Mollenkopf(2004) developed a logistics framework based on the research results of Bowersox et al. (1999) using a measurement model that considers supply chain performance representing five key performance areas: customer service, cost management, quality, productivity, and asset management. Ho (2007) proposed an integrated method, total related cost measurement, to evaluate the performance of a three-echelon ERP based supply chain system, including the rescheduling cost as well as carrying and ordering costs. Gunasekaran et al. (2004) suggested a framework for measuring the performance of a supply chain that consisted of three levels: strategic, tactical, and operational. McLaren and Vuong (2008) developed 83 major functional attributes that form five top-level categories: primary supply chain processes, data management, decision support, relationship management, and performance improvement. Some industry experts and consulting groups have also proposed a framework for SCM measurements (Lapide, 2000). Park et al. (2005) propose a framework for the balanced supply chain scorecard that considers the literature on the BSC and SCM, SCM solutions, and product characteristics. This framework consisted of four perspectives: financial perspective, customer perspective, business process perspective, and learning and growth perspective. Accordingly, to measure the performance of SCM, this study adopts the measurement items from the frameworks of Bowersox et al. (1999) and Park et al. (2005), which are well-defined to evaluate SC performance.

2.6 Effect of Enterprise Resource Planning on Supply Chain Management Performance

In the past decade, nearly all literature on ERP focused on reasons for implementation and on the challenges of the implementation project itself. Recently, several distinct research streams on ERP are observed in the literature. Some research on the effects of ERP systems on financial performance has found some evidence supporting the claim of ERP systems enable companies to achieve faster return on investment. Poston and Grabski (2001), analyze four financial characteristics before and after ERP adoption. Their results indicate that ERP adoption leads to efficiency increase in terms of a reduction in employee numbers and in the ratio of employees to revenues for each year following the ERP implementation. Nicolaou et al. (2003) compare financial data of companies adopting enterprise wide systems and of a matched control group of firms. The results from an analysis of performance differences across time periods show that firms adopting enterprise systems have significantly higher differential performance in their second year after the completion of the system than the control group. More recently, some researchers have turned their attention to the contribution of ERP systems to supply chain coordination, when supply chain is composed of several legal entities, such as in virtual enterprises or in an international context. Although there is no analytical framework for measuring the contributions and the effects of ERP systems on SCM performance, Byrd and Davidson (2003) have examined how the antecedents, IT department technical quality, IT plan utilization, and top management of IT positively affected IT effect on the supply chain. Wade and Hulland (2004) provide an overview of the literature on IT-related resources and their effect on firm strategy and performance. Akkermans et al. (2003) studied the future effect of ERP systems on supply chain management. One of their main findings is that the panel experts saw only a modest role for ERP in improving future supply chain effectiveness and a clear risk of

ERP actually limiting progress in SCM. Moreover, they identified key limitations of current ERP systems in providing effective SCM support

2.7 Enterprise Resource Planning adoption by Small Medium Enterprises

As ERP system adoption is typically accompanied with considerable investments in terms of time, money and effort, the decision to acquire an ERP system has major implications for the adopting organization. In large organizations, ERP system implementations may last several years, particularly if the system is heavily customized to make it better suit the needs of the adopting organization (Davenport, 1998). The great effort and difficulties related to ERP implementations, as well as the associated organizational change, have given ERP adoption projects a somewhat notorious reputation. It has been estimated in the literature that at least 90 percent of ERP implementations end up late or over budget (Martin, 1998), 40 percent achieve only partial implementation, and almost 20 percent are scrapped before completion as total failures (Trunick, 1999). Indeed, many ERP adoptions can be, in one way or another, considered failures (Davenport, 2000b; Larsen and Myers, 1999; Schneider, 2000; Scott, 1999).

All in all, the decision to acquire an ERP system is a long-term commitment and a considerable investment having a significant effect on the adopting organization. Most large organizations worldwide have already adopted an ERP system and smaller organizations have started to follow their lead (Everdingen *et al.*, 2000; Gable and Stewart, 1999). Due to a resource poverty typically characterizing smaller enterprises, the adoption of information systems, and thus, ERP systems, can be seen to represent a greater resource commitment and risk for them than for their larger counterparts (Cragg and King, 1993; Mabert *et al.*, 2000; Thong *et al.*, 1996; Thong, 2001; Welsh and White, 1981).

Compared to their larger counterparts, smaller enterprises typically exhibit limited access to resources such as time, skills, and money (Welsh and White, 1981). Further, due to a lack of slack resources, smaller enterprises in general are more vulnerable to the environmental effects and misjudgments (d'Amboise and Muldowney, 1988; Welsh and White, 1981). Limited resources also force smaller enterprises to allocate more time to adjusting to, rather than predicting and controlling, the turbulence they are faced with (d'Amboise and Muldowney, 1988).

Accordingly, resource poverty in the forms of financial constraints, and lack of time and knowledge, has been found to hinder IT adoption (Baker, 1987; Cragg and Zinatelli, 1995; Iacovou *et al.*, 1995; Proudlock *et al.*, 1999), and to negatively affect Information Systems (IS) implementation success (Thong, 2001) and IT growth (Cragg and King, 1993) in SMEs. Further, SMEs' decision-making and management related to information systems have been described as reactive, informal, intuitive (Bilili and Raymond, 1993), and opportunistic with a day-to-day focus (Doukidis *et al.*, 1996; Proudlock *et al.*, 1999). Also, the management skills needed for information systems planning and organization have been found to be limited in SMEs (Bilili and Raymond, 1993; Levy and Powell, 1998; Mitev and Marsh, 1998). In addition to hindering IT/IS planning (Proudlock *et al.*, 1998), the resource constraints faced by SMEs may hinder their ability to maintain technology up to date, while at the same time forcing them to consider their investments in IT as something that should last for a long time (Levy and Powell, 1998). The constraints may also force SMEs to assume an incremental approach to IT investments, which, in turn, may result in isolated and incompatible systems (Hasmi and Cuddy, 1990), as well as decreased flexibility (Levy and Powell, 1998). As a result, there is an evident discrepancy

between the management methods and skills employed by SMEs, and the systematization and the resources required by IT/IS planning and implementation (Bilili and Raymond, 1993).

2.8 Enterprise Resource Planning Risks

Many companies face difficulties implementing ERPs. Unlike other information technologies, ERP systems are sophisticated because of the coordinated involvement of the whole organization. Some of the issues range from employees finding it too difficult to make the necessary changes to extract benefits from the ERP systems to some companies actually experiencing decreasing efficiencies (Chuang, 2005).

2.9 Enterprise Resource Planning Deployment in Firms

Most of the research on ERP suggests corporations need to acquire ERP systems to gain a competitive advantage over their competitors. Recent research suggests that this resource-based view might be flawed because ERP software has become a commodity. Stratman (2007) found that manufacturing companies that implemented ERP systems gained operational efficiencies. Conversely, other organizations that adopt ERP systems to improve external market or supply chain conditions needed to do more work than manufacturers to realize operational improvements.

Many studies in the past did not have the data to make inferences about the effect of ERP adoption on financial performance since ERP applications are a relatively new technology. Past studies did not evaluate business process performance, which is needed to evaluate ERP effect on an organization. Instead, past studies sought to measure the effect of ERP adoption on overall firm performance. Organizations expect ERPs to benefit them in two ways. The first is increased productivity due to the automation of tasks and faster decision-making capabilities. The second

benefit is more financial gains because of improved customer service. To measure the direct benefit of ERP systems to an organization many variables have to be controlled. Researchers have been trying to measure competitive advantage from deploying ERP systems. This notion is troublesome because of the difficulty of measuring this competitive advantage from purchasing commercial software (Stratman, 2007).

Some corporations indicate they have gained financial improvements from ERPs, while others have earned negative returns due to ERP implementation. Some researchers suggest these conflicting results indicate that ERP systems are not the only reason for success for companies that achieved financial gains after ERP implementation (Stratman, 2007). Other researchers investigated the time factor of ERP adoption, and these researchers iterated that those organizations that did not receive immediate financial gains should wait longer to see if ERP adoption benefited their organization. These researchers indicated that at least 1 to 2 years should be adequate time to give insight into the benefits of ERP adoption (Wieder, 2006). To this date, researchers have not come to agreement about which indicators to use to measure ERP successful implementations.

A common approach is to use Matolcsy's approach, which uses net profit margins and the current ratios as key financial indicators. Matolcsy also uses fixed asset turnover, sales days outstanding, accounts payable days, inventory turnover and sales change as examples of process measures. Wieder's study uses operating profits and return on investment as key indicators because they had access to certain company income statements (Wieder, 2006). The resource-based view suggests firms can gain competitive advantage over their competitors if they have resources that are rare, inimitable, valuable, and non-substitutable. ERP systems are valuable, but

they are definitely not rare, non-substitutable, nor inimitable. Proponents of the resource based view would counter this argument by stating that organizations can uniquely combine the ERP systems to business processes, which will make ERP systems valuable, rare, non-substitutable, and inimitable. Furthermore, employees can be trained in a unique manner different from the competition (Stratman, 2007).

Stratman (2007) found that ERP systems enable automated transactions that improve productivity and efficiencies. Firms benefit more from operational efficiencies, which is not directly related to market related improvements. There could be many reasons why no significance is found from market related improvements when organizations deploy ERP systems. One reason could be the fact that it takes more than just installing ERP systems to gain profitably. Organizations have to integrate the ERP systems to essential business processes, and they must learn to leverage these systems to gain a sustainable competitive advantage (Chuang, 2005). Stratman's (2007) study also found significance for large firms benefiting more from ERP systems in terms of market performance. Furthermore, corporations have to experience operational improvements from ERP system deployments before they can realize market improvements. Organizations also have to realize operational improvements from within before gaining from external factors such as supply chain performance and customer satisfaction. Organizations must lower their expectations of the immediate benefits derived from ERP installments to allow true benefits to accrue in the future. Adding Customer relationship management software capability is a new trend that ERP vendors are pursuing. Strong interest in CRM applications is growing because of the potential customer service improvements these applications can provide for an organization (Stratman, 2007).

Wider's (2006) study also conducted a survey to analyze ERP systems deployment and the effect on organizational performance. This study focused on business process performance by finding organizations that integrated ERP systems with supply chain management systems (SCMS). Only 12% of the organizations surveyed adopted ERP systems in conjunction with supply chain management systems. Despite the low percentage of organizations deploying ERP and supply chain management systems in unison, firm performance for these organizations were better than organizations who only used ERP systems (Wieder, 2005) (Nah, 2004). Key financial indicators were used to study the ERP systems effect on business performance with supply chain management emphasis. No significance was found for companies that deployed ERP systems to improve firm performance in terms of operational efficiency and financial gains. Only those organizations that deployed ERP and supply chain management systems in conjunction achieved better performance at the business process level, but not the financial level. Wieder's conclusions coincided with Stratman's conclusions about no significance found in immediate financial gains from ERP adoption. However, in the long run, firm performance for ERP adopters exceeded non-ERP adopters. This can be explained by the high startup costs of ERP systems. Surprisingly, Wieder's study did not find improvements in supply chain performance in the short and long run (Wieder, 2006). Even organizations that have had substantial experience with ERP systems did not outperform their peers when measuring ERP benefits to organizations in the short run.

2.10 Enterprise Resource Planning Implementation Success Factors

In a study, Chuang (2005) researched the success factors of implementing ERP systems. The study found four significant variables that have strong correlations with ERP success factors. The variables are budget reliability, schedule reliability, system process knowledge, and companies' expectations.

Many companies think that a smooth integration will occur from ERP deployment, and these corporations are usually not prepared for unexpected events. Managers and employees have to be more involved in the implementation process of an ERP. Many times vendors take complete control of the implementation process, leaving managers and the IT department on the sidelines not knowing what's going on. Managers and the IT department have to be involved with the development stage to ensure the ERP system contains all the necessary business processes (Whitten & Bentley, 2008) (Chuang, 2005).

Others studies examined the relationship between supply chain integration and firm performance. While other studies examined who benefits the most in the supply chain from inter-organization integration. Chuang's (2005) study found that distributors and wholesalers benefited more than retailers in terms of inventory costs and back order quantities (Nah, 2004).

2.11 Conceptualization of the Study

This section relate various independent variables i.e. cycle time, development of organizational strategies, information flow and Operational efficiencies as a result of implementation of ERP with dependent variable effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya.

2.11.1: Cycle time

Reduced cycle time can translate into increased customer satisfaction. Quick response companies can launch new products earlier, penetrate new markets faster, meet changing demand, and can deliver rapidly and on time. They can also offer their customers lower costs because quick response companies have streamlined processes with low inventory and less obsolete stock. According to empirical studies, halving the cycle time and doubling the work-in-process

inventory can increase productivity 20% to 70%. Moreover, quartering the time for one step typically reduces costs by 20%. With reduced cycle times, quality improves too. Faster processes allow lower inventories which, in turn, expose weaknesses and increase the rate of improvement.

After eliminating non-value added transactions there are fewer opportunities for defects. Fast cycle time organizations experience more rapid feedback throughout the supply chain as downstream customers receive goods closer and closer to the time they were manufactured.

In lead time, application of ERP systems lead to lower inventories because manufacturers can make and buy only what is needed. Demands rather than demand insensitive order points drive time phased plans. Deliveries can be coordinated to actual need dates; orders for unneeded material can be postponed or canceled. The bills of material ensure matched sets are obtained rather than too much of one component and not enough of another. Planned changes in the bills also prevent inventory build up of obsolete materials. With fewer part shortages and realistic schedules, manufacturing orders can be processed to completion faster and work-in-process inventories can be reduced. Implementation of JIT philosophies can further reduce manufacturing lead times and the corresponding inventories (Farrington, 2007).

Improved procurement practices lead to better vendor negotiations for prices, typically resulting in cost reductions. Valid schedules permit purchasing people to focus on vendor negotiations and quality improvement rather than on expediting shortages and getting material at premium prices. ERP systems provide negotiation information, such as projected material requirements by commodity group and vendor performance statistics. Giving suppliers better visibility of future requirements helps them achieve efficiencies that can be passed on as lower material costs (Kouvelis, 2000). In today's competitive business environment, companies try to provide customers with goods and services faster and cheaper than their competitors. Often the key is to

have efficient integrated information system. Cheng (2003) increasing the efficiency of the information systems results in more efficient management of business processes. Until recently, most companies had un-integrated information systems that supported only the activities of individual biz-functional areas. Each had its own hardware, software and methods of processing data and information. Such un-integrated systems might work well within individual functional areas, but to achieve a company's goals, data must be shared among the functional areas. When a company's information systems are not integrated costly inefficiencies can result. An enterprise resource planning (ERP) system can integrate a company's operations by acting as a company-wide computing environment that includes a database that is shared by all functional area.

2.11.2: Strategies

Enterprise resource planning software plays a vital role in centralizing transaction data. ERP solutions are gaining significance as organizations strive to respond faster to market conditions.

The strategic benefits of ERP are a consequence of the system's ability to support business growth, reduce the cost of maintaining legacy systems, and capture the benefits derived from facilitation business learning, empowerment of staff and higher levels of employee morale and satisfaction (Shang and Seddon, 2000). Strategic benefit is an indication of an organization's competence in matching IT capabilities with the changing, cross-functional business requirements of the enterprise.

It is critical that a firm's information technology systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization.

Dynamically changing business needs may require operations strategy planners to continually evaluate cross-functional business goals and define the information systems capabilities that are required to support these goals. Thus, a formal strategic process is posited to contribute to the

quality of this ongoing activity, especially activity that can leverage supply chain processes to enhance performance need in each particular operating arena. Segarset al. (1998) has developed a set of scales to capture the domain of strategic, and these form the basis of the items and related hypotheses about the strategic benefits of ERP. In this model, the performances of SCM are driven by strategic benefits of the ERP system.

The tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources. Also, firms are getting benefits from monitoring and controlling of financial performance in the contexts of products, customers, business lines and geographic area (Byrd and Davidson, 2003). Tactical benefits are expected to improve the day-to-day business process (long-term effect), which reflects long-term benefits. Furthermore, ERP systems provide information benefits to process and resources management. Firms are likely to increase control over their suppliers by gaining power from information, and ERP applications, or similar integration solutions, are a leading tool for this purpose (Wade and Hulland, 2004). At the same time, those benefits, such as production orders, capability planning, resource allocation, production tracking and reporting, inventory management, waste/reject tracking, etc., also meet the competences needs of supply chains. As Campbell and Sankaran (2005) mentioned that ERP systems have a definite internal focus providing organizational connectivity and helping to better coordinate functions within organizations. The tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources. Also, firms are getting benefits from monitoring and controlling of financial performance in the contexts of products, customers, business lines and geographic area (Byrd and Davidson, 2003). Tactical benefits are expected to improve the day-to-day business process (long-term effect), which reflects long-term benefits. Furthermore,

ERP systems provide information benefits to process and resources management. Firms are likely to increase control over their suppliers by gaining power from information, and ERP applications, or similar integration solutions, are a leading tool for this purpose (Wade and Hulland, 2004). At the same time, those benefits, such as production orders, capability planning, resource allocation, production tracking and reporting, inventory management, waste/reject tracking, etc., also meet the competences needs of supply chains. As Campbell and Sankaran (2005) mentioned that ERP systems have a definite internal focus providing organizational connectivity and helping to better coordinate functions within organizations.

2.11.3: Information flow

The major goal of ERP is to unite the various departments across an enterprise through one system application package. The information managed by an ERP system can be utilized in many different ways. For example, executives and employees in production, customer service, accounting and finance are able to rely on the information within the system to make more effective decisions. This system with its ability to share information in today's business world becomes an invaluable tool, which provides various departments with the capacity to work in concert and communicate across a common interface.

From another aspect, ERP enables the integrated flow of information to be the core system that provides the data needed for all corporate components. In this way, how to take advantage of that information for the use of gaining competitive edge is the key to success. Since the above mentioned concept is clear but not yet perfect, the core system requires all components working together to attain excellent performance. In their case studies on the mainstream ERP systems, Palaniswamy and Frank (2000) also recognize that better cross-functional integration is a critical success factor.

Information managed by ERP systems can be used in business in many ways. Take a simple ERP function as an example. After a salesperson enters an order from the customer on a computer, the transaction data go through the entire company. The system then updates the inventory of parts and supplies automatically and worldwide if needed. Production schedules and balance sheets change as well. Most efficient of all, the employees of different departments have the information needed just in time to complete their jobs. The feedback would be fast. As for the salesperson, he or she then can inform the delivery dates, and the managers can receive the effects of financial, inventory, or SCM decisions immediately.

Katerrattanakulet al. (2006) studied ERP systems in Korean manufacturing firms and inform that the area most benefited from the ERP implementation were the availability and quality of information and integration of business operation/processes. On the other hand, the area least benefited from ERP systems were IT costs and personnel management. Compared to Shang and Seddon's (2002) five-dimensional ERP benefits, they found that operational benefits comes first, managerial benefits follows, while IT infrastructure benefits are in third position. Besides, they argue that the Korean manufacturing firms do not show any strategic or organizational benefits.

Spathis and Ananiadis (2005) observed that ERP system significantly contributes towards increased flexibility in information provision and improved decision making when they examined the effect of decision on the accounting and information management implemented in a large public university in Greece. They concluded that the implementation of ERP system show that managerial benefits come first, operational benefits follows, while IT infrastructure benefits are in third position. These orders of benefits are slightly different from Shang and Seddon (2002).

Spathis (2004) compared ERP implementation benefits with conventional information systems particularly in the accounting processes. He discusses the motives of ERP adoption such as integration of applications, real-time information, and particularly information for decision making. Furthermore, his empirical evidence confirms the number of changes in the accounting processes such as the introduction of internal audit function, the use of non-financial performance indicators, and profitability analysis at segment/product level.

2.11.4: Operational efficiencies

A successful ERP implementation will force organizations to standardize, restructure and streamline the internal functions (Akyuz and Rehan, 2008). Kim (2007) based on an activity-based costing analysis to show great potential to reveal how an ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes. In Shang and Seddon (2000) established that the operational benefits of an ERP system arise from automating cross-functional process. Those benefits are expected to improve day-to-day operations (short-term effect), which include improved inventory control, improved cash management, and reduction in operating costs. They will also lead to improvements in production, information and customer service quality. ERP is a suite of application modules that can link back-office operations to front-office operations, as well as internal and external supply chains (Anderson and Gerbing, 1991). Incorporating ERP in SCM is supposed to further enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among channel members (Ho, 2007). Thus, comparing the SCM performance with those operational benefits of

ERP, it is not hard to find some correlation between the operational benefits of ERP and the SCM performance.

2.12 Conceptual Framework

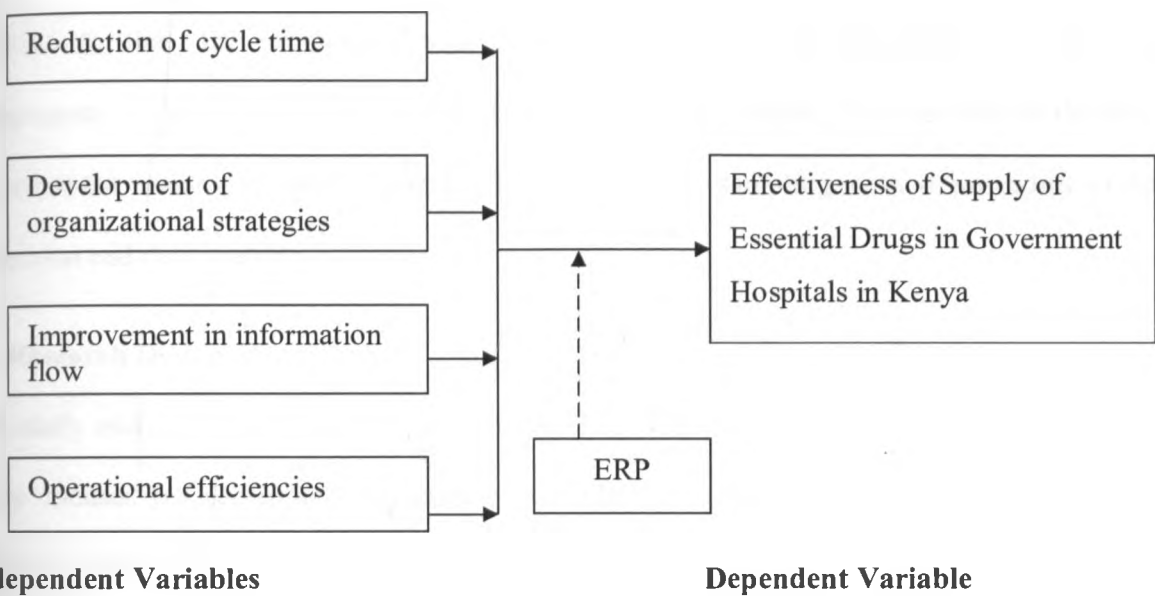


Figure 1: Conceptual Framework

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

This section comprises the research instruments which the researcher used in the study. In addition to that, the sampling design and the data collection procedures are important components of a research and are also contained in this chapter. This section of the study describes the research design, the target population and the sampling method, procedure of data collection and data analysis.

3.1 Research Design

The study used descriptive research design, which was the most applicable for the study, as the study focuses on describing independent variables. This scientific method of investigation involves collection and analysis of data in order to describe a phenomenon in its current condition or status, Kothari (2001) continues to indicate that this design is preferred because it is time saving, it is possible and easy for the researcher to obtain current factual information from the employees in the organization. Also it is a cheaper method of studying the organization and coming up with accurate and deeper findings.

3.2 Target Population

Target population was the totality of elements that has one or more characteristics in common Williamson (1999), this study is intended to have the staff of Kenya Medical Supplies Agency as the target population. The target population was 175 employees. Since the population comprises of homogeneous characteristics, the researcher arranged them in strata consisting of procurement officers, departmental managers and support staff. The researcher then used the target population

to get the research sample that was used in the study as respondents. The target population has been presented on Table 3.1.

Table 1: Target Population

Category	Target Population	Percentage
Top Management Staff	10	6
Middle Management Staff	25	14
Support Staff	140	80
Total	175	100

Source: Research data (2012)

3.3 Sample Design

Sampling is a procedure of data collection where a few units from the whole population are collected and the results obtained from these few units generalized for the whole population Williamson (1999). The researcher used census since the population size is small. The researcher considered all the staff of KEMSA, 10 top management staff, 25 middle management staff, and 140 supporting staff. In total the researcher targeted 175 KEMSA staff for this study. According to Mugenda and Mugenda (2008) a census is an attempt to collect data from every member of the population being studied rather than choosing a sample.

3.4 Sampling Procedures

There were often factors which divided the population into sub-populations. This had to be accounted for when selecting a sample from the population in order to obtain a sample that is representative of the population. This was achieved by stratified sampling. A stratified sample was obtained by taking samples from each stratum or sub-group of a population, Lockesh (2003). When sampling a population with several strata, generally it requires that the proportion of each

stratum in the sample should be the same as in the population. Using this method, the sample will be divided into different strata's of the organization whereby the divisions will be according to their working levels.

3.5 Data Collection Instruments and Procedure

In this study the researcher employed a questionnaire as the instrument of data collection. A questionnaire is a collection of questions to which a research subject is expected to respond. Mugenda & Mugenda (2003) this instrument can be administered orally as the researcher records the responses to each item independently. In the study, the researcher will draft several questions in the questionnaires. These will be given to different personnel in the organization who thereafter will give back the necessary information and details. Advantage of using this method includes: its' inexpensiveness because once the questionnaires are given to willing respondents there is no further cost, the researcher simply waits for the respondents to give feed back at their own convenience. Another advantage is that some respondents can give the feedback immediately. It will also enable the researcher to make extensive inquiry from the respondents who are not easily approachable being contacted through the questionnaire.

3.6 Validity and Reliability

The validity of a research instrument was concerned with the accuracy with which the instrument measures were supposed to. This study used a questionnaire and tested its validity by use of content validity, which is a process of logical analysis that involves careful and critical examination of items in the research questionnaire. A few managers from KEMSA were given the questionnaires to fill in order to ensure that they carry valid content. The reliability depended on the research questionnaire used in this study. It gave reliable information that was used in

decision making. It was therefore able to produce the same results if used by other researchers. To establish the reliability of the research questionnaire, a pre-test of the same was done.

3.7 Data Analysis and Presentation

The researcher collected data in large quantity which was organized in such a way that further analysis and interpretation of data can be made easy. The data was edited, coded and classified so as to present the results of the data analysis in a systematic and clear way. The researcher used descriptive statistics and integrates both the qualitative and quantitative techniques in the data analysis. The research will further use regression model for his analysis of the data.

3.7.1: Regression Model

A multivariate regression model was applied to establish the relative importance of each of the four variables in relation to the study which sought to understand the influence of different factors towards the effectiveness of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya. The regression model was as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Effectiveness of the supply of essential drugs

β_0 = Constant Term

$\beta_{1,2,3,4}$ = Beta coefficients

X_1 = Cycle Time

X_2 = Organizational Strategies

X_3 = Information Flow

X_4 = Operational Efficiencies

3.8: Operationalization

Table 3.1: Operational Definitions of Variables and Measuring Indicators

Variables	Indicators	Measurements	Measurements Scales	Study Designs	Tools of Analysis
Research Objective 1	To establish the effect of reduction of cycle time as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya				
<i>Independent Variables</i> Cycle Time	1. Length of Cycle Time	1) deliver rapidly and on time 2) low inventory and less obsolete stock 3) work-in-process inventories	Ordinal Interval		Descriptive statistical analysis by computing the means, standard deviation of responses to questionnaire items.
Research Objective 2	To establish the effect of development of organizational strategies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya				
<i>Independent Variables</i> organizational strategies	1) organizational strategies manuals	1) coordinate functions within organizations 2) databases to plan 3) reduction in employee numbers	Nominal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the means, standard deviation of responses to questionnaire items.

Research Objective 3	To evaluate the effect of improvement in information flow as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya				
Independent Variables Information Flow	1) Efficiency in Information Flow	1) real-time information 2) speed of feedback 3) flexibility in information provision and improved decision making	Nominal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the means, standard deviation of responses to questionnaire items.
Research Objective 4	To examine the effect of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya				
Independent Variable Operational Efficiencies	1) effectiveness of operation	1) standardize, restructure and streamline the internal functions 2) product costs 3) day-to-day operations 4) distribution productivity	Nominal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the means, standard deviation of responses to questionnaire items.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.1 Introduction

This chapter presents the findings of the study on the effect of enterprise resource planning on the effectiveness of the supply of essential drugs in government hospitals in Kenya, based on the research questions. It includes the demographic and background information of respondents, and data analysis of the views, observations and experiences of the respondents in the effect of enterprise resource planning on the effectiveness of the supply chain. SPSS was used to analyze data.

4.2: Response Rate

The questionnaire return rate is shown in the Table below

Table 4.2 Response Rate

	Frequency(n)	Percentage
Returned	150	86%
Unreturned	25	14%
Total	175	100%

4.3 Background information

4.3.1 Gender

From the findings 54% of the respondents were male while 46% were female. It was easier for the researcher to approach male respondent to get this information the female respondents the findings are shown by the table below.

Table 4.3 Gender

	Frequency(n)	Percentage
Male	95	54%
Female	80	46%
Total	175	100%

4.3.2 Highest level of education

Most of the respondent had college level education, 60%, followed by bachelors, 35%, and only 5% had masters level of education as shown by the table below.

Table 4.4 Education level

	Frequency(n)	Percentage
Master's Degree	8	5%
Bachelor's Degree	52	35%
College level	90	60%
Total	150	100%

4.4 Cycle Time

From the findings enterprise resource planning helped to improve lead time as shown by the table below that is those who said it helped are 63% and only 37% think that it did not help to improve lead time

Table 4.5 Cycle time

	Frequency (n)	Percentage
Yes	95	63%
No	55	37%
Total	150	100%

From the findings on effect of reduction of cycle time as result of ERP on effectiveness of supply of essential drugs in government hospitals in Kenya, deliveries are coordinated to actual need dates; orders for unneeded material are postponed or canceled, ERP has lead to fewer part shortages and realistic schedules, and work-in-process inventories has been reduced, ERP has lead to deliver rapidly and on time, fast cycle time organizations experience more rapid feedback throughout the supply chain, reduced cycle time due to ERP has translated into increased customer satisfaction respondents agreed (mean between 1.5 to 1.98 and standard deviation is between 0.78 to 1..23) with these statement as indicated by their standard deviation and means respectively while only ERP has lead to low inventory and less obsolete stock respondents are undecided with a mean of 2.10 and standard deviation of 1.9. On average all these statements the respondents agreed with them as shown by the table below.

Table 4.6 Cycle time statements

	Mean	Standard deviation
Reduced cycle time due to ERP has translated into increased customer satisfaction	1.98	1.23
ERP has lead to deliver rapidly and on time	1.88	1.05
ERP has lead to low inventory and less obsolete stock	2.10	1.9
Fast cycle time organizations experience more rapid feedback throughout the supply chain	1.97	1.19
ERP has lead to fewer part shortages and realistic schedules, and work-in-process inventories has been reduced	1.74	1.09
Deliveries are coordinated to actual need dates; orders for unneeded material are postponed or canceled	1.5	0.78

4.5 Organizational Strategies and effectiveness of Supply of Essential Drugs

The findings on effect of development of organizational strategies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization, ERP adoption leads to efficiency increase in terms of a reduction in employee numbers, ERP systems provide information benefits to process and resources management, the firm is likely to increase control over its' suppliers by gaining power from information flow and ERP applications, or similar integration solutions, the tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources the respondents agrees with these strategies as shown by low standard deviations and mean (mean range from 1.15 to 1.6 while standard deviation range from 0.82 to 1.08) as shown by the table below.

Table 4.7 Organization structure

	Mean	Standard deviation
ERP adoption leads to efficiency increase in terms of a reduction in employee numbers	1.23	0.88
ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization	1.15	0.82
The tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources	1.6	1.08
ERP systems provide information benefits to process and resources management.	1.35	0.94
The firm is likely to increase control over its' suppliers by gaining power from information flow and ERP applications, or similar integration solutions	1.44	0.98

4.6 Information Flow and effectiveness of Supply of Essential Drugs

The findings on whether experience challenges in information flow are caused by the adoption of enterprise resource planning 40% of the respondents think that information flow is a challenge in adoption of enterprise resource while,60%, majority think it is not a challenge

Table 4.8 Information flow

	Frequency (n)	Percentage
Yes	60	40%
No	90	60%
total	150	100%

On the effect of improvement in information flow as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, ERP brings real-time information, ERP system significantly contributes towards increased flexibility in information provision and improved decision making, ERP has made the feedback to be fast and Executives and employees in production, customer service, accounting and finance are able to rely on the information within the ERP system to make more effective decisions respondents agrees and the employees of different departments have the information needed just in time to complete their jobs respondents are undecided as indicated by their means between 1.15 to1.8 and 2.2 respectively and standard deviation between 0.98 to 1.32 and 1.9 respectively as shown by the table below.

Table 4.9 Improvement in information flow

	Mean	Standard deviation
Executives and employees in production, customer service, accounting and finance are able to rely on the information within the ERP system to make more effective decisions	1.8	1.32
The employees of different departments have the information needed just in time to complete their jobs	2.2	1.9
ERP has made the feedback to be fast	1.4	1.10
ERP system significantly contributes towards increased flexibility in information provision and improved decision making	1.32	1.08
ERP brings real-time information	1.15	0.98

4.7 Operational Efficiencies and effectiveness of Supply of Essential Drugs

From the findings ERP lead to operational efficiencies in KEMSA as indicated by 60% of the respondents while only 40% think other wise.

Table 4.10 Operational efficiencies

	Frequency	Percentage
Yes	90	60%
No	60	40%
Total	150	100%

The findings on the effect of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, ERP enhances the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among KEMSA channel members, ERP has lead to improvements in production, information and customer service quality, ERP benefits has improved day-to-day operations such as improved inventory control, improved cash management, and reduction in operating costs, ERP implementation has made KEMSA to standardize, restructure and

streamline the internal functions and ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes respondents agree as indicated by mean ranging from 1.1. to 1.44 and standard deviation ranging from 0.99 to 1.17 as shown by the table below.

Table 4.11 Effectiveness of Supply

	Mean	Standard deviation
ERP implementation has made KEMSA to standardize, restructure and streamline the internal functions	1.22	1.09
ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes	1.44	1.17
ERP benefits has improved day-to-day operations such as improved inventory control, improved cash management, and reduction in operating costs	1.33	1.11
ERP has lead to improvements in production, information and customer service quality	1.12	0.99
ERP enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among KEMSA channel members	1.16	1.01

4.8 Correlation Analysis

In order to establish the strength of the relationship between enterprise resource planning and the supply of essential drugs, Pearson's Product Moment Coefficient analysis (PPMC) was used.

The researcher used the Pearson moment correlation and the findings were as in the table below.

From the findings, two predictor variables information flow, cycle time, organizational strategies and Operational efficiencies are said to be correlated if their coefficient of correlations is greater than 0.5. In such a situation one of the variables must be dropped or removed from the model. As

shown in table below, none of the predictor variables had coefficient of correlation between themselves more than 0.5 hence all of them were included in the model. The matrix also indicated high correlation between the response and predictor variables, that is, information flow, cycle time, organizational strategies and operational efficiencies respectively.

Table 4.12 Pearson Correlation

	Information flow	Operation Efficiencies	Cycle time	Strategies
Information flow	1.000			
Operational efficiencies	.760	1.000		
Cycle time	.746	.434	1.000	
Strategies	.634	.412	.469	1.000

According to the findings on the effect to improve operational efficiency in distribution productivity of public drug supply among KEMSA channel members, should do so with the knowledge that a number of options exist on choosing an appropriate option, but also on the way in which the option is implemented.

4.8.1 Analysis of variance (ANOVA)

The probability value (p-value) of a statistical hypothesis test is the probability of getting a value of the test statistic as extreme as or more extreme than that observed by chance alone, if the null hypothesis H0 is true. The p-value is compared with the actual significance level of the test and, if it is smaller, the result is significant. The smaller it is the more convincing is the rejection of the null hypothesis. ANOVA findings in table 4.11 shows that there is correlation between the predictors variables (cycle time, organization strategies, information flow and operation

efficiencies) and response variable (effectiveness of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya) since P- value of 0.00 is less than 0.05.

Table 4.11 Analysis Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135.830	4	33.958	102.784	.000(a)
	Residual	29.404	89	.330		
	Total	165.234	93			

Predictors: (Constant, cycle time, organization strategies, information flow and operation efficiencies)

Dependent Variable: effectiveness of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya.

The above summary of the basic logic of ANOVA is the discussion of the purpose and analysis of the variance. The purpose of the analysis of the variance is to test differences in means (for groups or variables) for statistical significance. The accomplishment is through analyzing the variance, which is by partitioning the total variance into the component that is due to true random error and the components that are due to differences between means. The ANOVA analysis is intended to investigate whether the variation in the independent variables explain the observed variance in the outcome – in this study the effectiveness of enterprise resource planning on the supply of essential drugs in government hospitals in Kenya.

The ANOVA results indicate that the independent variables significantly ($F=102.784$, $p=0.001$) explain the variance in business performance. In this context, as have been presented in the table above, the dependent variable is the level of performance whiles the independent or the predictors, cycle time, organization strategies, information flow and operation efficiencies.

Mainly the study was on dependence and independent relationship, a moderate multiple regression analysis was used. The multiple regression analysis is mathematically expressed as shown below: A multivariate regression model was applied to establish the relative importance of each of the four variables with respect to the influence of effectiveness of supply of essential drugs. The regression model was as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where:

Y = Effectiveness of the supply of essential drugs

β_0 = Constant Term

$\beta_{1,2,3,4}$ = Beta coefficients

X_1 = Cycle Time

X_2 = Organizational Strategies

X_3 = Information Flow

X_4 = Operational Efficiencies

Regression equation and the predictor relationship

The established multiple linear regression equation becomes:

$$Y = 0.497 + 0.439X_1 + 0.685X_2 + .876X_3 + 0.506X_4$$

Where

Constant = 0.497, shows that if cycle time, organization strategies, information flow and operation efficiencies were all rated as zero, Effectiveness of the supply of essential drugs rating would be 0.497

$X_1 = 0.439$, shows that one unit change in Cycle Time results in 0.439 units increase in Effectiveness of the supply of essential drugs

$X_2 = 0.685$, shows that one unit change in organization strategies results in 0.685 units increase Effectiveness of the supply of essential drugs

$X_3 = .476$, shows that one unit change in information flow, results in .476 units increase in Effectiveness of the supply of essential drugs

$X_4 = 0.306$, shows that one unit change in operation efficiencies results in 0.306 units increase Effectiveness of the supply of essential drugs

Regression coefficients

Table 13: Regression coefficients

	Un-standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.497	.167		2.980	.004
Cycle time	.439	.212	.933	4.431	.000
Organizational Strategies	.685	.142	.826	5.526	.000
Information flow	.476	.126	.793	5.895	.000
Operation efficiencies	.306	.073	.321	4.174	.000

Strength of the model

Analysis in table 4.11 shows that the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables) R^2 equals 0.822, that is, cycle time, organization strategies, information flow and operation efficiencies explain 82.2 percent of the influence of effectiveness of the supply of essential drugs leaving only 17.2 percent unexplained.

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
				R Square Change	F Change	df1	df2	Sig. Change	F
.907(a)	.822	.814	.57479	.822	102.784	4	89	.000	

Table 4.14: Model Summary

Predictors: (Constant), cycle time, organization strategies, information flow and operation efficiencies.

Adjusted R^2 is called the coefficient of determination and tells us how Effectiveness of the supply of essential drugs varied cycle time, organization strategies, and information flow and operation efficiencies. From above, the value of adjusted R^2 is 0.814. This implies that, there was a variation of 81.4% of business performance varied with d cycle time, organization strategies, information flow and operation efficiencies at a confidence level of 95%.

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND
RECOMMENDATION

5.1 Introduction

This chapter presents the summary of findings, discussion, conclusion drawn from the findings and recommendations made. The conclusions and recommendations drawn focus on the purpose of the study.

5.2 Summary of Finding

The study established that enterprise resource planning helped to improve lead time. However, ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization, also ERP adoption leads to efficiency increase in terms of a reduction in employee numbers, ERP systems provide information benefits to process and resources management. This helps firm to increase control over its' suppliers by gaining power from information flow and ERP applications.

The study results indicated that ERP lead to improvement in information flow which results to increase in effectiveness of supply of essential drugs in government hospitals in Kenya. The study found that ERP brings real-time information, ERP system significantly contributes towards increased flexibility in information provision and improved decision making, ERP has made the feedback to be fast and Executives and employees in production, customer service, accounting and finance are able to rely on the information within the ERP system to make more effective decisions respondents agrees and the employees of different departments have the information needed just in time to complete their jobs respondents are undecided.

According to the study findings ERP lead to development of organizational strategies which increases effectiveness of supply of essential drugs in government hospitals in Kenya. The study found that ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization, ERP adoption leads to efficiency increase in terms of a reduction in employee numbers, ERP systems provide information benefits to process and resources management, the firm is likely to increase control over its' suppliers by gaining power from information flow and ERP applications, or similar integration solutions, the tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources the respondents agrees with these strategies as shown by low standard deviations and mean.

ERP lead to operational efficiencies in KEMSA as indicated by majority and on the effect of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, ERP enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among KEMSA channel members, ERP has lead to improvements in production, information and customer service quality, ERP benefits has improved day-to-day operations such as improved inventory control, improved cash management, and reduction in operating costs, ERP implementation has made KEMSA to standardize, restructure and streamline the internal functions and ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes respondents agree with these strategies .

5.3 Discussion of the findings

As per the study findings enterprise resource planning helped to improve lead time, from the study findings on effect of reduction of cycle time as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, deliveries are coordinated to actual need dates; orders for unneeded material are postponed or canceled, ERP has lead to fewer part shortages and realistic schedules, and work-in-process inventories has been reduced, ERP has lead to deliver rapidly and on time, fast cycle time organizations experience more rapid feedback throughout the supply chain, reduced cycle time due to ERP has translated into increased customer satisfaction respondents agrees with these statement while only ERP has lead to low inventory and less obsolete stock respondents are undecided. The study concurred with the findings of Farrington, (2007) who indicated that faster processes allow lower inventories which, in turn, expose weaknesses and increase the rate of improvement. can deliver rapidly and on time. Planned changes in the bills also prevent inventory build up of obsolete materials. With fewer part shortages and realistic schedules, manufacturing orders can be processed to completion faster and work-in-process inventories can be reduced.

According to the study findings ERP lead to development of organizational strategies which increases effectiveness of supply of essential drugs in government hospitals in Kenya. The study found that ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization, ERP adoption leads to efficiency increase in terms of a reduction in employee numbers, ERP systems provide information benefits to process and resources management, the firm is likely to increase control over its' suppliers by gaining power from information flow and ERP applications, or similar integration solutions, the tactical benefits arise from the use of databases to plan better and for

better management of production, manpower, inventory and physical resources the respondents agrees with these strategies as shown by low standard deviations and mean. The study approved the findings of Byrd and Davidson, (2003) who indicated that ERP system support the strategic goals of the firm such as reduction in labor/employee cost, control over its' suppliers and quality improvement of organization services.

The study found that on whether experience challenges in information flow are caused by the adoption of enterprise resource planning majority think it is not a challenge, the study on the effect of improvement in information flow as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya, ERP brings real-time information, ERP system significantly contributes towards increased flexibility in information provision and improved decision making, ERP has made the feedback to be fast and Executives and employees in production, customer service, accounting and finance are able to rely on the information within the ERP system to make more effective decisions respondents agrees and the employees of different departments have the information needed just in time to complete their jobs respondents are undecided. In today's competitive business environment, companies try to provide customers with goods and services faster and cheaper than their competitors. Often the key is to have efficient integrated information system. Cheng (2003) increasing the efficiency of the information systems results in more efficient management of business processes.

When Incorporating ERP in SCM is supposed to further enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among channel members (Ho, 2007). From the findings ERP lead to operational efficiencies in KEMSA as indicated by majority and on the effect of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya,

ERP enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among KEMSA channel members, ERP has lead to improvements in production, information and customer service quality, ERP benefits has improved day-to-day operations such as improved inventory control, improved cash management, and reduction in operating costs, ERP implementation has made KEMSA to standardize, restructure and streamline the internal functions and ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes respondents agree with these strategies.

5.4 Conclusion

The study concludes that ERP to great extent reduce the cycle time thus improving the effectiveness of supply of essential drugs in government hospitals in Kenya. This translates into increased customer satisfaction. Quick response companies can launch new products earlier, penetrate new markets faster, meet changing demand, and can deliver rapidly and on time this much indicated by effects of reduction of cycle time as result of ERP on Effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya is caused by enterprise resource planning and the stake holders should continues improving the cycle time as the study found out.

The study concludes that ERP leads to development of organizational strategies thus improving the effectiveness of supply of essential drugs in government hospitals in Kenya. This study agrees with a study done by Shang and Seddon, 2000 which had a view that strategic benefits of ERP are a consequence of the system's ability to support business growth, reduce the cost of maintaining legacy systems, and capture the benefits derived from facilitation business learning, empowerment of staff and higher levels of employee morale and satisfaction.

The study further concludes that ERP improvement in information flow as thus improving the effectiveness of supply of essential drugs in government hospitals in Kenya. This study concur with Katerrattanakul *et al.* (2006) on ERP systems in Korean manufacturing firms and inform that the area most benefited from the ERP implementation were the availability and quality of information and integration of business operation/processes.

The study finally concludes ERP system increase operational efficiency thus increasing the effectiveness of supply of essential drugs in government hospitals in Kenya. Those benefits are expected to improve day-to-day operations (short-term effect), which include improved inventory control, improved cash management, and reduction in operating costs.

5.5 Recommendation of the Study

The study recommends that KEMSA should continue applying the ERP system in their day to day activity due to the fact that it has enabled the effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya. The effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya has been achieved by reduction of cycle time, development of organizational strategies, improvement in information flow and increase in operational efficiencies. The researcher further recommends that other organizations should apply ERP system in their procurement and logistics activities due to the fact that it will enhance their effectiveness and efficiency due to reduction of cycle time, development of organizational strategies, improvement in information flow and increase in operational efficiencies.

5.6 Recommendations for further study

The researcher recommends that a similar study should be taken in a different organization to verify the findings of this study. The researcher further recommends that future researchers should investigate on the extent of employee knowledge and ability to use ERP system as the researcher noted the low level employee do not understand ERP system well.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Isaac Osiemo Onyinkwa,

P.O Box 11554 – 00100

Nairobi – Kenya.

Cell Phone 0722394035

17th May 2012

Dear Sir/Madam,

RE: TO WHOM IT MAY CONCERN

I am Osiemo, Isaac Onyinkwa, a Master of Arts student from the University of Nairobi carrying out a survey to identify the 'Effects of Enterprise Resource Planning in the Supply of Essential drugs in Government hospitals in Kenya.

In my schedule, I would be visiting your organization for a face- to -face interview and a questionnaire with the staff members who will be sampled for this purpose to represent your organisation. The date, time of arrival departure will be communicated to your firm over cell phone. Kindly circulate this information to all staff for their awareness and maximum participation.

Yours Sincerely,

Isaac Osiemo Onyinkwa

APPENDIX II: QUESTIONNAIRE

Section A: background information

1. What is your Gender?

Male []

Female []

2. What is your highest level of education?

Master's Degree []

Bachelor's Degree []

College level []

Section B: Cycle Time

3. Has enterprise resource planning helped to improve lead time?

Yes []

No []

Give reason for your answer

.....
.....

4. Explain how enterprise resource planning can help to reduce lead time being experienced in the supply of drugs.

.....
.....

5. To what extent do you agree with the following statement on effect of reduction of cycle time as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?

Key: 1 strongly agrees, 2 agree, 3 undecided, 4 disagree, 5 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
Reduced cycle time due to ERP has translated into increased customer satisfaction					
ERP has lead to deliver rapidly and on time					
ERP has lead to low inventory and less obsolete stock					
Fast cycle time organizations experience more rapid feedback throughout the supply chain					
ERP has lead to fewer part shortages and realistic schedules, and work-in-process inventories has been reduced					
Deliveries are coordinated to actual need dates; orders for unneeded material are postponed or canceled					

Section C: Organizational Strategies

6. What are the strategies that KEMSA has come up with as result of ERP?

.....

7. Do you agree that ERP systems have a definite internal focus providing organizational connectivity and helping to better coordinate functions within organizations?

.....

8. To what extent do you agree with the following statement on effect of development of organizational strategies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?

Key: 1 strongly agrees, 2 agree, 3 undecided, 4 disagree, 5 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
ERP adoption leads to efficiency increase in terms of a reduction in employee numbers					
ERP systems support the strategic goals of the firm and it helps to ensure that IT development goals are aligned with the needs of the organization					
The tactical benefits arise from the use of databases to plan better and for better management of production, manpower, inventory and physical resources					
ERP systems provide information benefits to process and resources management.					
The firm is likely to increase control over its' suppliers by gaining power from information flow and ERP applications, or similar integration solutions					

Section D: Information Flow

9. Explain how enterprise resource planning can be applied in various functions in the organizations so that it can enhance information flow within the organization.

.....

10. Do you experience information flow challenges that is caused by the adoption of enterprise resource planning

Yes [] No []

Give reason for your answer

.....
.....

11. To what extent do you agree with the following statement on effect of improvement in information flow as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?

Key: 1 strongly agrees, 2 agree, 3 undecided, 4 disagree, 5 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
Executives and employees in production, customer service, accounting and finance are able to rely on the information within the ERP system to make more effective decisions					
The employees of different departments have the information needed just in time to complete their jobs					
ERP has made the feedback to be fast					
ERP system significantly contributes towards increased flexibility in information provision and improved decision making					
ERP brings real-time information					

Section E: Operational Efficiencies

12. What is your opinion on operational efficiencies in KEMSA before and after the implementation of ERP?

.....
.....

13. Does ERP lead to operational efficiencies in KEMSA?

Yes []

No []

Give reason for your answer

.....
.....

14. To what extent do you agree with the following statement on the effect of operational efficiencies as result of ERP on effectiveness of Supply of Essential Drugs in Government Hospitals in Kenya?

Key: 1 strongly agrees, 2 agree, 3 undecided, 4 disagree, 5 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
ERP implementation has made KEMSA to standardize, restructure and streamline the internal functions					
ERP system is utilized for activities in operational levels and how it affects product costs, which helps management better understand the benefits of ERP implementation, and make strategic decisions or reengineering business processes					
ERP benefits has improved day-to-day operations such as improved inventory control, improved cash management, and reduction in operating costs					
ERP has lead to improvements in production, information and customer service quality					
ERP enhance the effectiveness of delivery scheduling, inventory control, and transportation modal planning and hence increase distribution productivity among KEMSA channel members					

THANK YOU