APPLICATION OF THE HINES VALUE CHAIN MODEL BY THE KENYA MEDICAL SUPPLIES AGENCY
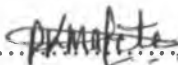
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A Management Research Project Submitted In Partial Fulfilment of The Requirements of The Master of Business Administration Degree, Department of Business Administration, University Of Nairobi
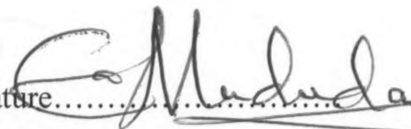
2010

DECLARATION

This management research project is my original work and has not been presented to this or any other University for an academic award.

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Marete Phyllis Kinanu

This management research project has been submitted for examination with my approval as the University supervisor.

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DEDICATION

This work is dedicated to my lovely husband Mr. Muchiri for your support and to my dear son Avidan for your patience and understanding while I was not available when you needed me most.

ACKNOWLEGMENTS

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LIST OF ABBREVIATIONS

KEMSA -   Kenya Medical Supplies Agency

SCM   -   Supply Chain Management

MOH   -   Ministry of Health

NGO   -   Non Governmental Organization

KNH   -   Kenyatta National Hospital

NHSSP -   National Health sector Strategic Plan

PHF   -   Public Health Facility

PPDA   -   Public Procurement and Disposal Act

PPDR   -   Public Procurement and Disposal Regulations

RHF   -   Rural Health Facility

HRM   -   Human Resource Management

ABC   -   Activity Based Costing

TQM   -   Total Quality management

EDI   -   Electronic Data Manufacturer

OEM   -   Original Equipment manufacturer

SA   -   Supplier Association

MOMS-   Ministry of Medical Services

MOPHS-   Ministry of Public Health and Sanitation

EML   -   Essential Medicines List

MEDS -   Missions for Essential Drugs Supply

ABSTRACT

The Kenya medical supplies agency from its inception in the year 2000 to the year 2007, adopted the Michael Porter's value chain model ('push' strategy) to supply essential drugs to all the public health facilities in the country. Due to the need to focus on service delivery aspects to enhance customer satisfaction in the year 2008, KEMSA started introducing the Peter Hines's value chain model ('pull' strategy) to deliver essential drugs to some of the key hospitals in the country alongside with the push strategy.

With these imperatives in mind, the study examined the application of the Hines's value chain model by KEMSA. The objectives of the study were to first, establish the extent to which KEMSA has adopted the Hines's value chain model in dealing with the supply of essential drugs to the PHF's. Second, to determine the challenges associated with the adoption of the Hines's value chain model and third to identify the benefits of adopting the Hines's value chain model as compared to the Porter's model initially adopted by KEMSA in supplying all the PHFs in the country.

To explore these issues, primary data was collected via interview from four managers of the core function departments. The findings were then analysed using content analysis. Results of the study indicated that overall adoption of the pull strategy is to a moderate extent because only one third of the health facilities are supplied using 'pull' strategy while the remaining two thirds are supplied using the 'push' strategy. However the health facilities in the one third category are all key facilities including all the District and provincial hospitals.

The extent of adoption was analysed according to the value chain parameters; supply process system, structure and direction, primary activities and secondary activities whereby the findings of the study have shown that KEMSA has adopted most of the practices in relation to these parameters to support the pull strategy. In addition an analysis of the challenges and benefits associated with the adoption of the Hines's value chain model have been outlined. The challenges include; forwarding of irrational orders

by overburdened health workers and occasional training of the health facilities due to staff turnover. Benefits include solving of undersupply and oversupply issues, solving of the accountability problems and enhancement of customer satisfaction objective. However, despite the challenges associated with the adoption of the Hines's value chain model, it is the preferred strategy by the respondents as they confirmed that the right decision was made in choosing to introduce this strategy and believe that the strategy would be more effective in all players i.e. KEMSA, health facilities, and the ministries (ministry of medical services and ministry of public service and sanitation) played their roles well.

On the basis of the study several recommendations were deemed appropriate. The findings seem to point to the need to focus on a few issues in support of the value chain parameters. These are: reduction of lead time, revise the essential medicines list in order to meet and exceed the performance expectations of all levels of the health facilities, the ministries under health to play their roles effectively and enable KEMSA to effect the quantification role and the final issue of concern is for the management to expound their role of enhancing employee participation and empowerment.

The limitation of this study related to the scope of the study. The study only focused on one organization that supplies drugs hence the results may not be generalized to other organizations that supply drugs like the missions for essential drugs supply (MEDS). Further research could be carried out in the public health facilities supplied by KEMSA with an aim of determining customer satisfaction levels with the supply process strategy that KEMSA has adopted. In addition further research could also be carried out in MEDS with the aim of establishing the extent to which the organization has adopted the Hines's value chain model in dealing with the supply of drugs to the mission hospitals in Kenya.

CHAPTER ONE: INTRODUCTION

1.1   Background of the Study

In today's dynamic global environment, change rather than stability is the order of the day. Rapid changes in customer's demand have for instance increased the rate at which companies need to alter their strategies and structure just to survive in the market place (Charles & Gareth, 1998). Webster (1992) noted that the strategic concept of marketing has shifted the focus of marketing from a microeconomic maximization paradigm to a focus of managing strategic partnership and positioning the firm between vendors and customers in the value chain with the aim and purpose of creating value for customers.

As healthcare services provided by government hospitals across the country are highly subsidized by the government, this triggers an alarm for the suppliers of drugs, medical requirements and other medical necessities to maintain their products at an affordable cost. These issues point to the pivotal need for effective Supply Chain Management (SCM) in terms of efficient resource utilization and at the same time improving customer satisfaction. Since one of the main goals of any health care organization is not only to meet but also to exceed the expectations of their customers, attempts to improve the levels of satisfaction of their customers and stakeholders are viewed as of paramount importance.

In the pharmaceutical industry the health facilities are viewed as customers of this industry. This is because the health facilities rely heavily on the drugs and medical equipments for the diagnosis and clinical management of the patients. It is therefore imperative for the suppliers of the drugs and medical equipments to attend to the needs of the health facilities to their satisfaction as any inefficiency in the supply process will result in inefficiency in patient treatment which eventually results in dissatisfaction to the hospital pharmacists, doctors and patients (Hamid, Bakar & Hakim, 2010). According to Kotler (2003), in a hyper competitive economy with increasingly rational buyers, a company can only win by creating and delivering superior value. This involves

the following five capabilities; understanding customer value; creating customer value; delivering customer value; capturing customer value and sustaining customer value. To succeed a company needs to use the concepts of a value chain and a value-delivery network...To be successful a firm needs to look for competitive advantages, beyond its operations into the value chains of its suppliers distributors and customers. Many companies today have partnered with specific suppliers and distributors to create a superior value-delivery network (also called a supply chain). Despite much theoretical discussion around improvement of supply chain competitiveness through delivering enhanced consumer value, there is little enhancement and alignment of customer value. As a result, there is a dreath of tools and techniques that academics and practitioners can use to create ever more effective value chains.

However Hines and Rich (1998) contend that:

> "... in order to achieve the delivery of excellent products and services to end –consumers it is necessary to harness the expertise, enthusiasm and dynamism of all the firms that contribute to the final consumable. In order to do this, it is necessary to view each of the value adding processes in each of the companies responsible as a part of a value stream dedicated to the final consumer's requirements".

It has been reported that the supply chain of the health care industry is different from the manufacturing sector in terms of the level of customization of services provided, the degree of participation of a partner or consumer and the uncertainty underlying the basic process (Pitta & Laric 2004). As such, the healthcare providers are unable to predict patient mix and the demand for a particular item. This explains why they are unable to control or project their projection schedules (Jarrett, 1998). This is true enough in the current context where doctors request services from clinical laboratories or request drugs from the hospital pharmacy according to the current needs of the patients. All these make the healthcare value chain more dynamic and complex (Evans and Berman, 2001) and this significantly impacts on the performance measurement of the healthcare organizations.

1.1.1 Value Chain Models

Based on the seminal work of Porter (1985), the value chain came to be understood in the context of the internal activities of a company that create value for its customers. The value chain took a holistic approach and induced management of each of the company's elements. That view led to further refinement in the value delivery system (Bower & Garda, 1985; Evans & Berman, 2001). This approach shifted emphasis from an internal company focus on functions and activities to an external consumer oriented view of the value that company products and services delivered. Thus, the value delivery system looks at the company from the consumer's perspective.

As researchers refined the value delivery system concept, it becomes clear that the system, including its suppliers, partners, manufacturers and customers was the important focus. This approach unveiled the role of multiple stakeholders in helping to create value and set the stage for relationship marketing and a more network view (Norman & Ramirez, 1994). The value chain for any firm in any business is the linked set of value creating activities all the way from basic raw material sources for component suppliers through to the ultimate end –use product delivered to the customer (Johnson & Scholes, 2002). The focus of value chain analysis is to examine the corporation in the context of the overall chain of value creating activities of which the firm may be only a small part (Wheelen & Hunger, 2008).

Kotler (2003) adds that every firm is viewed (disaggregated) as a collection of value activities that are performed to design, produce market, deliver and support its product. The purpose of value chain is to attain full and seamless interaction among stakeholders to create a win-win situation. This has great potential in unlocking value (Ayers, 1999). It involves identification of value chain in business processes, communicating them, analyzing them, and continuously improving them. According to Johnson and Scholes (2003), it is the cost of the activities, described as key internal factors by Pierce and Robinson (2002) and the value they deliver that determines the amount of value created.

The key assumptions of value chain are that organizations are much more than a random compilation of machines, money and people (Johnson & Scholes, 2003). These resources are of no value unless they are deployed into activities and organized into routines and subsystems that ensure products or services are produced and are valued by the customer. Optimization of the strategic capacity of an organization entails identification of separate value activities and analyzing value contributed by each activity.

According to Thompson, Strickland and Gamble (2007), access to all the capabilities in a value chain is required in order to compete over the long term in that business. However an organization can gain this access in a variety of ways. One of the fundamental issues in developing operations strategy, i.e. competitive strategy is which activities should be performed internally and which should be left to others such as suppliers, customers or partners. The main goals of value chain are; to measure the value attributes and appreciate how various functions or activities within supply chain adds value. Secondly, to identify value attributes in services and products and lastly, to understand the customer requirements and communicate them to suppliers.

According to Lysons and Farrington (2006), important value chain models have been developed by Professor Michael Porter and Professor Peter Hines. Value chain analysis is concerned with a detailed examination of each subsystem in a supply chain and every activity within these subsystems with a view to delivering maximum value at least possible total cost, enhancing value and synergy though out the entire chain. The main differences between the two approaches are on the principal objectives, on the process followed, on the structure and direction, on classification of primary activities and finally on the classification of secondary (support activities). The porters approach is driven principally by a profitability objective while the Hines's approach is guided by customer satisfaction objective. It's a 'push' system for porter's approach while Hines's approach is a 'pull' system.

1.1.2 Public Health Facilities (PHFs) /Institutions in Kenya

The Kenya government through the ministry of health (MOH) strives to provide quality healthcare for all citizens so that they may lead economically and socially productive lives. The provision of health services in Kenya is liberalized. There are public/ government hospitals and private hospitals. The provision of healthcare services in government hospitals is either free or subsidized on cost sharing basis.

The ministry of health is vested with the overall mandate for health services promotion under the public health Act Cap 242 of the laws of Kenya and under various subsidiary legislations dealing with the specific areas of health services provision. It is therefore responsible for the creation of an enabling environment for the provision of sustainable quality health care that is affordable and accessible to all Kenyans. The health sector comprises of the public health system with major players being the ministry of health and the ministry of Local Authority. Other players are the Non –governmental Organizations (NGOs), missions and the private sector. Kenya's public health infrastructure has grown rapidly since independence and presently the ministry of health has built an impressive pyramidal health referral system. (This was made possible with considerable support from harambee efforts).

At the apex are Kenyatta National Hospital (KNH) and Moi Referral Hospital which are the national referral hospitals. Below KNH are 7 provincial hospital; 70 district hospitals; 96 sub district hospitals; 642 health centres; 3170 dispensaries; 10 rural health demonstration centres and 5 Rural health training centres. The dispensaries provide basic consultation services and drugs. Health centres generally have a pharmacy and a laboratory as well as a few beds for delivery or transit. The sub districts range from a little more than health centres to large district type facilities presently all provincial and district hospitals have separate private wings known as Amenity wards. The MOH management structure is therefore in four levels; central, provincial, district and facility. KNH operates as a state corporation under the MOH (Collins *et al* 1995). Despite these major gains, population growth outstrips the capacity of the MOH to cater for the demands of services.

The government remains the major financier of health care services, meeting nearly half of the national health recurrent expenditure (MOH 42 per cent and ministry of Local Authority 5 per cent). The private market (insurance and out of pocket modes) meets 42 per cent, while the missions and NGOs meet 7 per cent of the expenditure (NHSSP: 1999 – 2004). The Kenya Health Care Policy Framework states that there is a general lack of the essential inputs required for effective patient care in public hospitals. None of these augers well for providing quality healthcare in MOH facilities and with the existence unable to provide adequate levels of quality care in its institutions.

1.1.3   The Kenya Medical Supplies Agency (KEMSA)

The Kenya Medical Supplies Agency (KEMSA) is a specialized medical logistics provider for Ministries of Medical Services/Public Health and Sanitation-supported health facilities and programmes. KEMSA works to support the National Health Strategic Plan and the Kenya Health Package for Health in providing public health facilities with the "right quantity and quality of drugs and medical supplies" at the best market value. KEMSA's overall mandate is to procure, warehouse and distribute medical commodities to public health facilities operated by the Ministry of Medical Services.

The Agency was formed on 11th February 2000 as a result of recommendations of a health stakeholders' forum dubbed "Strategies for Reforming the Drug and Medical Supplies Systems in Kenya" held between June 7 and 10, 1998. A State Corporation established by a legal notice issued under CAP 466 of the Laws of Kenya, KEMSA replaced successive medical stores administrations that had existed since 1901 under various names. KEMSA works to support the National Health Strategic Plan and the Kenya Health Package for Health in providing public health facilities with the "right quantity and quality of drugs and medical supplies" at the best market value".

Public health facilities (PHFs) have over the years experienced erratic and sometimes non-supply of essential drug and medical commodities. Recurrent stock-outs, expires and unreliable delivery schedules forced Kenyans to avoid seeking health services from government-run health institutions. As a result, diseases burden snowballed, even as expenditure on health sector increased and as a country acquired more qualified personnel in all medical disciplines. Meanwhile, the country was falling back on its own deadline for eradication of public enemy number one diseases.

Recognizing that access to drugs and other medical supplies was the missing link between availability of skilled services providers and successful health care outcomes, health stakeholders met at Kenya College of communication Technology, Mbagathi, from June 7 to 10,1998 to brainstorm on the matter. One of the key recommendations was to set up an autonomous corporate entity....."To plan, procure and distribute drugs to PHFs." Accordingly KEMSA was created purposely to provide a central institutional framework for planning and sourcing medical supplies. As envisioned in the National Health Strategic Plan and Kenya Health Package for Health, KEMSA ensures the right quantity and quality of drugs and medical supplies are available to PHFs at affordable prices (http://www.kemsa.co.ke)

1.1.2.1 KEMSA's Core Functions

KEMSA's core functions include procurement, warehousing and distribution of medical supplies (http://www.kemsa.co.ke). First, KEMSA's procurement is governed by the Public Procurement and Disposal Act (PPDA) and Public Procurement and Disposal Regulations (PPDR) and has as such set up a Tender committee, Procurement committee, Evaluation committee and Receiving and Acceptance committee to foster transparency and accountability in procurement processes.

 KEMSA's procurement process demonstrates a significant degree of efficiency and effectiveness and in compliance with the provisions in procurements legislations, particularly the Public Procurement and Disposal Act. Besides, the process is open and transparent. Further KEMSA offers a more competitive procurement price for medical

commodities compared to those of other procurement agencies. A mainstay function, procurement's task is to source efficacious drugs and medical commodities at verifiable value-for-money prices for the tax-paying public. Our procurement procedures are guided by the Public Procurement Regulations. KEMSA was created purposely to provide institutional framework for sourcing medical supplies centrally in order to ensure quality and economies of scale.

Second core function is warehousing; Integrity of medical commodities requires more than just a roof over an open space in a four-wall enclosure. The specialized nature of drugs and medical commodities call for state-of-the-art racking schemes that facilitate ease of storage and stock retrieval procedures. Storage conditions for drugs and medicines vary from product to product in terms of lighting, temperatures and humidity, conditions that KEMSA warehouses throughout the country fulfill. Warehousing activities are also conducted to ensure the highest health and safety standards.

The third core function is distribution and customer service; Customer Service Centers are conveniently located in Nairobi, Mombasa, Kisumu, Nakuru, Eldoret, Kakamega, Nyeri, Meru and Garissa. Manned by competent Regional Liaison Officers, the regional customer service teams work closely with health Institutions to identify, quantify and make requisitions for essential drugs and medical commodities on behalf of our clients. Over and above ensuring sustainable stock levels of essential drugs and medical commodities, the regional liaison teams are also responsible for sensitizing health practitioners and the public on rational drug use.

1.1.2.2 KEMSA's Current Strategy for Delivering Essential Drugs to the PHFs

According to the MOH health facility list issued in April (2008), KEMSA supplies drugs to 4,002 health facilities country wide which include; Referral hospitals for special cases (mental and spinal injuries), provincial hospitals, district hospitals, sub district hospitals, health centres and Rural Health Facilities (RHFs) (appendix IV). The Referral, provincial, district and sub district hospitals are supplied every two months while the

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dispensaries and the health centres and RHFs are supplied on quarterly basis. According to KEMSA's standard operating procedures manual issued in August (2009), Currently KEMSA uses both the 'Push' and 'pull' strategies to deliver or distribute drugs to the PHF's. The 'pull' strategy is purely applied to all health facilities in some specified major regions which include; Nairobi, coast, North Eastern, Thika, Nyeri, machakos, Kitui and Mwingi. All other regions in the country excluded in the list, both 'pull' and 'push' strategies are applied where by, for the provincial, district and sub district hospitals, 'pull' strategy is used while the dispensaries, health centres and RHFs use the 'push' strategy.

The government through the Ministry of Medical Services procures the drugs and distributes to the Health facilities. The government maintains a booklet that lists the essential drugs that the facilities should have (appendix V). Those facilities that apply the 'Push' system are therefore provided with a standard kit that contains various drugs. This kit contains some drugs irrespective of the geographical location. Yet through experience some diseases are only unique to certain geographical areas. With the standard kit, some areas receive drugs they have no use for them while other receive an under supply of some drugs.

1.2   Problem Statement

Environment is constantly changing and each time it changes it presents new challenges for the management by causing threats and weaknesses. The change in the environment triggers strategic responses by firm's causing them to change their strategies to match with the environment. Firms should be able to shift their strategies with changes in the environment and match their capabilities to the selected strategies in order to survive, succeed and remain relevant (Porter, 1985). The responses to challenges in the firm's environment point to the increasing focus on satisfying customers (Palmer, 2001).

The scope of this study will therefore focus on the two value chain models by Michael Porter and Peter Hines. The Porter's approach is driven principally by a profitability objective while the Hines's approach is guided by customer satisfaction objective. It's a 'push' system for Porter's approach while Hines's approach is a 'pull' system.

Organizations have adopted either Porter's or Hines's model in their operations and this has affected them in one way or another. However as stated by Ghalayini and Noble (1996), organizations have to realign their processes to environmental changes in order to enable them compete effectively. Value should be the driving force behind such processes and readjustments since global market considers value rather than the cost as the primary success driver.

Since KEMSA started its operations of delivering drugs to the PHFs in the year 2000, they adopted the Michael Porter model approach ('Push' system), but with effect from January 2008, Peter Hines model approach ('Pull' system) was introduced. Currently KEMSA applies the two approaches to supply the essential drugs to the various health facilities in the country. The application of either strategy is judged by the region and the facility category but in all the major health facilities the model adopted is the Hines model as it enhances customer satisfaction. The health facilities rely heavily on the drugs and medical equipments for the diagnosis and clinical management of the patients. It is therefore imperative for the suppliers of the drugs and medical equipments like KEMSA to attend to the needs of the health facilities to their satisfaction as any inefficiency in the supply process will result in inefficiency in patient treatment which eventually results in dissatisfaction to both the customers and the consumers (Hamid, Bakar & Hakim, 2010).

The customers of KEMSA in this study are the PHFs which include; Referral Hospitals, Provincial Hospitals, District Hospitals, Sub- District Hospitals and RHFs while we refer to the patients as the end users or consumers of the drugs. The main objective why KEMSA changed from the initial 'push' system and adopted the 'pull' system two years ago in most of the major health facilities in the country was to enhance customer satisfaction an objective which could not be met while operating under the 'push' system only.

This study is therefore geared towards assessing the application of the value chain models by KEMSA by establishing the extent to which KEMSA has adopted the Hines's model in its operations of supplying essential drugs to most PHFs in the country , challenges faced by the management as a result of adopting the model in supplying most PHFs in the country and the benefits of adopting the Hines's model as compared to the Porter's model which KEMSA had initially adopted in supplying all the PHFs in the country.

Among other studies carried out in the area of value chain are Musau (2000); The researcher carried out a survey on value chain management practices of large manufacturing firms in Kenya focusing on the extent of adoption of the concept and the challenges faced in adopting the concept. Odero (2006) made an investigation into the value chain and competitive advantage in the corporate banking industry in Kenya. Ikundo (2007) carried out a survey on the perceptions of pharmaceutical producers and end users towards the role played by pharmaceutical distributors using the value chain concept in Kenya.

From the studies carried out, it appears that value chain activities and how they are performed do create value to customers who are the main focus of any business. However these studies made earlier on the value chain may not be expected to provide insight to the adoption of the value chain models by a firm and the challenges and benefits associated with the adoption of a particular model hence the need for the current study. This study will aim at answering the following questions: To what extent has KEMSA adopted the Hines's value chain model in dealing with the supply of essential drugs to the PHFs? What are the challenges associated with the adoption of the Hines's value chain model in supplying essential drugs to most PHFs in the country and what are the benefits of adopting the model as compared to the Porter's model initially adopted by KEMSA in supplying all the PHFs in the country?

1.2   Research Objectives

This study addresses the following three objectives;

i.   To establish the extent to which KEMSA has adopted the Hines's value chain model in dealing with the supply of essential drugs to the PHFs;

ii.   To determine the challenges associated with the adoption of the Hines's value chain model in supplying essential drugs to most PHFs in the country;

iii.   To identify the benefits of adopting the model as compared to the Porter's model initially adopted by KEMSA in supplying all the PHFs in the country.

1.4   Importance of the Study

The findings of this study are expected to provide the managers and other decision makers of KEMSA with insight into the benefits of adopting the Hines's value chain model in dealing with the supply of essential drugs to the PHFs. In addition the value chain adoption criteria used by KEMSA shall help other companies in designing or redesigning their value chain model adoption procedures.

The study will also provide an insight that will be useful to firms aiming at creating a competitive advantage over its rivalries. The firms can examine the different strategies that are available to them in trying to establish competitiveness. Therefore it will be helpful in planning strategies to apply in attacking the market. Finally the study is also important to scholars wishing to carry out further studies in the Agency and in the PHFs.

CHAPTER TWO: LITERATURE REVIEW

2.1   The Concept of Value Chain

To better understand the activities through which a firm develops a competitive advantage and creates shareholder value, it is useful to separate the business system into a series of value generating activities referred to as the value chain. Every firm is a collection of activities that are performed to design, produce, market, deliver and support its product. All these activities can be represented using a value chain. A firm's value chain and the way it performs individual activities are a reflector of its history, its strategy, its approach to implementing its strategy and the underlying economies of the activities themselves (Porter 1985)

The term value chain was therefore used by Porter (1985) to describe the activities on organization performance and links them to its competitive position. Drury (2000) sees value chain from an economist point of view as a change in management behaviour and an organizational strategy for increasing customer satisfaction and managing costs more effectively. Close to Drury's point of view is Thompson and Strickland (2003) who views it as a tool of strategic cost analyses identifying the separate activities, functions, and business process that are performed in designing, producing marketing, delivering and supporting a product or service. Johnson and Scholes (2002) states that the value chain for any firm in any business is the linked set of value creating activities all the way from basic raw material sources for component suppliers through to the ultimate end-use product delivered to the customer.

Chase, Jacobs and Acquilano (2004) sees value chain as a tool systems approach from raw material, Suppliers through production to final customer aimed at reducing defects, maintaining optimal inventory levels, shorts production lead time, and improved customer satisfaction in terms of cost efficiency, quality and delivery. Lysons and Farrington (2006) view a value chain as a linear map of the way in which value is added by means of a process from raw materials to finished delivered product (including service

after delivery). Ayers (1999) has given a summary point of view by stating that value chain includes all business processes that put the product in the hands of end users.

The purpose of business organizations is to create and deliver value to customers and profit to shareholders (Ansoff & Macdonnel, 1994). Johnson and Scholes (2002) views value Chain analysis as a valuable tool for understanding how value is lost or created in a business. Much of cost and value creation occur in the supply and distribution chain. An understanding of the life value creation process is important in helping managers identify where and how value may be created within the organization and in the wider value network. Johnson and Scholes further states that the ability of an organization to influence the performance of other organizations in the supply chain may be crucially important competence and a source of competitive advantage.

As regarded by Thomas and Hunger (2008), the focus of value chain analysis is to examine the corporation in the context of the overall chain of value–creating activities of which the firm may be only a small part. Johnson and Scholes (2002) asserts that value chain analysis describes the activities within and around an organization and relates them to an analysis of the competitive strength of an organization (or its ability to provide value- for- money products or services). Value analysis was originally introduced as an accounting analysis to shed light on the 'value–added' by separate steps in complex manufacturing processes in order to determine where cost improvements could be made or value creation improved or both. These two basic steps of identifying separate activities and assessing the value added by each were linked to an analysis of an organizations' competitive advantage by Porter (1985).

Competitive advantage is critical to the success of a business. According to Johnson and Scholes (2002), value creation centres on the amount that buyers are willing to pay for a product or service. In his article "where is The Real Value", Maclean (2003) adds that a business is profitable and this competitive if the value it creates exceeds the costs of performing the "value activities". Value chain analysis therefore enables the firm to identify and concentrate on its core competences and outsource those functions and

resource where it has no distinctive competencies (Porter, 1985). Johnson and Scholes has defined distinctive competencies as those resources organizations possess that are relatively unique, provide a valuable service to customers and are difficult to copy.

Research has revealed that the main goals of value chain are; to measure the value attributes and appreciate how various functions or activities within how various functions or activities within supply chain adds value. Secondly it is to identify value attributes in services and products and thirdly to understand the customer requirement and communicate them to suppliers. Important value chain models have been developed by professor. Michael Porter and Professor Peter Hines of the Havard school of Business (Lysons & Farrington, 2006).

2.2   Michael Porter's Value Chain Model

The concept of value chain has been popularized by Professor Michael Porter and has proved very useful in business process re-engineering as a strategy for increasing customer value and shareholders value at the same time (Porter, 1985).

As developed by Porter , this approach of value chain is one way to disaggregate the firm for purposes of internal analysis and systematically viewing the series of activities a firm performs to provide its customers with a product.

According to Pearce and Robinson (1997), the value chain disaggregates a firm into its strategically important activities in order to understand the behaviour of the firm's cost and the firms' existing of potential sources of differentiation. A firm gains competitive advantage by performing these strategically important activities that include key internal factors, more cheaply or better than its competitors. The diagram of a typical value chain model by Porter is shown in figure 2.1.

Figure 2.1: Michael Porter's value chain model.

	Firm infrastructure (General management, accounting, finance, strategic planning, IT systems)				
Support activities	Human resource management (Recruiting, training, development				
	Technology development (Research and development, product and process improvement)				
	Procurement (Purchasing of raw materials, machines, suppliers)				
Primary activities	Inbound logistics (Raw materials, handling and warehousin g)	Operatio ns (Machini ng assemblin g testing)	Outbound logistics (Warehousi ng and distribution of finished products)	Marketing and sales (Advertisin g promotion, pricing, relationship s)	Service (Installati on, repairs, spares)

Upstream

Downstream

Pearce and Robinson (1997) further adds that value chain analysis is based on the assumption that a business's basic purpose is to create value for users of its products and services. In value chain analysis managers divide the activities of their firm into sets of separate activities that add value. Their firm is viewed as a chain of value- creating activities starting with providing raw materials or inputs and continuing through design. Component production, manufacturing and assembly, distribution, sales delivery and support of the ultimate user of its products or services. Porter (1985), describes that each of these activities can add value and each can be a source of competitive advantage. Pearce and Robinson noted that by identifying and examining these activities, managers often acquire an in-depth understanding of their firm's capabilities, its cost structure, and how these create competitive advantage or disadvantage.

Porter (1985) states that the activities of a business can be classified into two major categories, five primary activities and four support activities, each of which will potentially contribute to competitive advantage. Pearce and Robinson (1997) further clarifies that primary activities are those involved in the physical creation of the product, marketing and transfer to the buyer and after-sale support. Support activities assist the primary activities by providing infrastructure or inputs that allow them to take place on an ongoing basis. The goal of these activities is to offer the customer a level of value that exceeds the cost of the activities thereby resulting in a profit margin. Thompson and Strickland (2003) have also added that the value chain includes a profit margin because a mark up over the cost of performing the firms value creating activities is customarily part of the price (or total cost) paid by buyers –creating value that exceeds the cost so as to generate a return for the effort. The literature below shows the primary and the support activities of the value chain model by Professor Michael Porter.

2.2.1   Primary Activities

Porter (1985) identifies five primary activities that add value to the logistics and final output of a company. These are: inbound logistics, outbound logistics, marketing and sales and services. First is the inbound logistics; these activities involve managing the flow of products into the company. Recent attention to just-in-time manufacturing has shown how important this can be the efficient operation of a company and how by management of its suppliers and their quality a company can add to the quality of its final products (Hooley et al, 2008). Johnson and Scholes (2002);Lysons and Farrington, 2006; Pearce and Robinson (1997) and Porter (1985) have described the inbound logistics as all activities linked to receiving, handling and storing inputs into the production system, including warehousing transport and stock control.

The second primary activity is operations; Hooley et al (2008) argue that operations have long been seen as the central activity of businesses. These comprise the processes whereby the inbound items are changed in form, packaged and tested for suitability for use. Traditionally this has been seen as the area where value is added to a company's products. At this stage, value can be added beyond the normal capital and manpower

inputs by the maintenance of high quality, flexibility and design. Therefore Johnson and Scholes (2002); Lysons and Farrington (2006); Pearce and Robinson (1997) and Porter (1985) provides the description of operations as all activities involved in the transformation of inputs to outputs as the final product(s). They have clarified that in a manufacturing enterprise, these would include production, assembly, quality control and packaging. While in a service industry, these include all activities involved in providing the service, such as advice, correspondence and preparation of documents by a legal firm.

The third primary activity is outbound logistics. According to Johnson and Scholes (2002); Lysons and Farrington (2006); Pearce and Robinson, (1997) and Porter (1985),outbound logistics carry the product from the point of operations to the end user, including finished goods warehousing, order processing, order picking and packing, shipping, transport and maintenance of a dealer or distribution network. Hooley *et al* (2008) adds that at this stage value can be added through quick and timely delivery, low damage rates and the formulation or delivery mechanisms that fit the operations of the user.

Marketing and sales is the fourth primary activity and Johnson and Scholes (2002); Lysons and Farrington (2006); Pearce and Robinson, (1997) and Porter (1985) have explained these as activities involved in informing potential customers about the product, persuading them to buy and enabling them to do so; including advertising, promotion market research and dealer distributor support. Hooley *et al* (2008) further explains that marketing and sales can concern feedback, which allows the user company to user requirements or by helping customers understand the economic value of products that are available.

The fifth primary activity is Service activities; They are involved in the provision of services to buyers offered as part of the purchase agreement, including installation, spare parts delivery, maintenance and repair technical assistance, buyers' enquiries and complaints (Johnson & Scholes, 2002; Lysons & Farrington, 2006; Pearce & Robinson, 1997 and Porter, (1985). Therefore these activities are required to keep the product or

service working effectively for the buyer, after it is sold and delivered. Since customer satisfaction is central to achieving repeat sales and word-of-mouth communication from satisfied customers, after –sales service a clearly a major part of added value (Hooley *et al.*, 2008).

2.2.2   Support Activities

In support of the primary activities of the value chain, Porter (1985) also identified support activities. These are procurement, human resource management technology development and infrastructure. These of course feed into each stage of the primary activities of the value chain. Johnson and Scholes, (2002); Lysons and Farrington (2006); Pearce and Robinson (1997) and Porter (1985) gives a description to each of them.

Procurement refers to all activities involved in acquiring resource inputs to the primary activities, including the purchase of fuel, energy, raw materials, components, sub assemblies, merchandise and consumable items from external vendors. According to Porter (1985), a given procurement activity can normally be associated with a specific value activity or activities which it supports, though often a purchasing department serves many value activities and purchasing policies apply firm wide.

Technology development is the second activity; every value activity embodies technology, be it know-how, procedures, or technology embodied in process equipment. Technology development consists of a range of activities relating processes and resource utilization including research and development. Process design improvement, computer software, computer aided design and engineering and development of computerized support system. Porter (1985) noted that Technology development that is related to the product and its features support the entire chain, while other technology development is associated with particular primary or support activities.

Human resource management (HRM) which is the third activity consist of activities, costs and assets involved in the recruiting, hiring, training, development and compensation of all types of personnel; labour relations activities, development of knowledge – based skills. As clarified by Porter (1985), HRM supports both individual primary and support activities and the entire value chain. Therefore HRM activities occur in different parts of a firm, as do other support activities and the dispersion of these activities can lead to inconsistent policies. Moreover, the cumulative costs of HRM are rarely well understood nor are the tradeoffs in different HRM costs, such as salary compared to the cost of recruiting and training due to turn-over.

Firm infrastructure/General administration is the fourth support activity and it consists of a number of activities, costs and assets relating to general management, planning, finance, accounting, legal and regulatory affairs safety and security, quality management, management information systems, formation of strategic alliances and other "overhead functions". Porter (1985) noted that infrastructure, unlike other support activities, usually supports the entire chain and not individual activities. He further adds that depending on whether a firm is diversified or not, firm infrastructure may be self – contained or divided between a business unit and the parent corporation. In diversified firms, infrastructure activities are typically split between the business unit and corporate levels (e.g. financing is often done at the corporate level while quality management is done at the business unit and corporate level).

2.3   Hines's Value Chain Model

In his Journal 'The value chain redefined', Hines (1993) recognized that Porter made two valuable contributions to the understanding of value chain systems. First, Porter places a major emphasis on the materials management value- adding mechanism, raising the subject to a strategic level in the minds of serious executives and second he places the customer in an important position in the supply chain.

However Hines (1993) presents a critique of Porter's model identifying three major problems. Neither Porter nor the firms discussed concede that consumer satisfaction not company profit should be their primary objective. The focus of Porter's model is on the profit margin of each enterprise, not the consumer's satisfaction. Secondly, although Porter acknowledges the importance of integration, his model shows a rather advised network, both within the company and between the different organizations in the supply chain and lastly. Hines believes that the wrong functions are highlighted as being important in Porter's primary and support activities.

According to Lysons and Farrington (2006), the three criticisms highlighted above result from the fact that Porter's model is based solely on American cases without referencing to more innovative Japanese enterprises' Porter's conclusions may therefore prove inappropriate for companies facing the challenges of the 21st century with the prospect of an array of more developed competitors. He pointed out that in some cases close adherence to Porter's methodology may prevent firms from further continual development.

Hines (1993) therefore proposed customer focused value chain approach that differs with Porters profit based approach. He therefore offered alternative models to support his customer focused approach. According to Lysons and Farrington (2006) Hines offered two models to correct the problems earlier highlighted about Porters model. The models offered are: a micro integrated materials value pipeline and a macro ten forces partnership model.

2.3.1 Hines's Micro Integrated Materials Value Pipeline

The micro integrated materials value pipeline model is shown in figure 2.2.

Figure 2.2:   Hines Micro Integrated Materials Value Pipeline
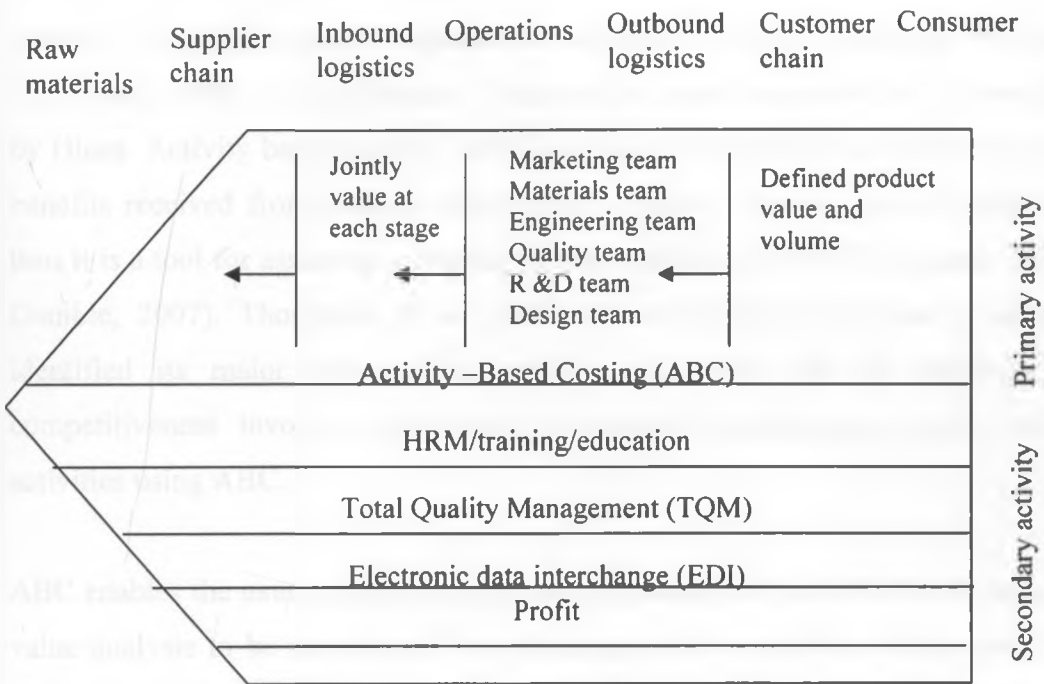
Source: Lysons, K. & Farrington, B (2008), Purchasing and supply chain management .7th Ed. Pearson Education Limited, Prentice Hall., pg 104.

As portrayed in figure 2.2 above, Hines's primary activities concentrate strongly on focused value of the product or service in its different stages, suggesting that the main objective of the value chain is to add value for consumer and customer. As a result of this, the consumer and primary activities are based strongly on different team: marketing team; materials team; engineering team; Quality team, Research and development team and design team all working together jointly to define product value at each stage and the value chain has been turned around to face the opposite direction to that in Porters model (Lysons and Farrington, 2006). Hines model emphasizes that the primary functions in each of the separate firms in the value chain must be integrated all external barriers and internal divisions must be broken down, and there should be collaboration rather than just competition (Hines, 1994).

Moreover in the secondary activities, Hines emphasizes utilization of concepts like transparent costing system (ABC), knowledge creation (HRM/ training/education), Quality (TQM) and quick response to customers (EDI). According to Lysons and Farrington (2006), the significance of each of the secondary activities has been identified by Hines. Activity based costing (ABC) is a cost attribution to cost units on the basis of benefits received from indirect activities e.g. ordering, setting up and assuring quality thus it is a tool for assessing a company's cost competitiveness (Thompson, Strickland & Gamble, 2007). Thompson *et al.* (2007) further explains that once a company has identified its major value chain activities, the next step in evaluating its cost competitiveness involves determining the cost of performing specific value chain activities using ABC.

ABC enables the exact cost of products and the benefits of activities such as *Kaizen* and value analysis to be ascertained. By allocating costs to activities rather than functions, true costs involved in delivering the product can be identified. A simple method of the value chain analysis is to call the price charged to the customer at the end of each supply chain 100 per cent and by working backwards, ascertain the cost of each supply activity. ABC therefore enables the most serious non – value- adding problems to be identified first and addressed promptly.

Human Resource Management involves activities like employee training and education which facilitates effectiveness efficiency and pro active thinking. Total Quality management provides a culture for all network members. Electronic data interchange together with intranets and Extranets and so on facilitate quick response to customer requirements and draw network members closer together. Lastly, Profit should be roughly equalized between network members and result from reducing total production and consumption costs to below what consumers are willing to pay for products meeting their specifications.

2.3.2 Hines's Macro Ten Force Partnership Model

Figure 2.3: Hines's Macro Ten Force Partnership Model
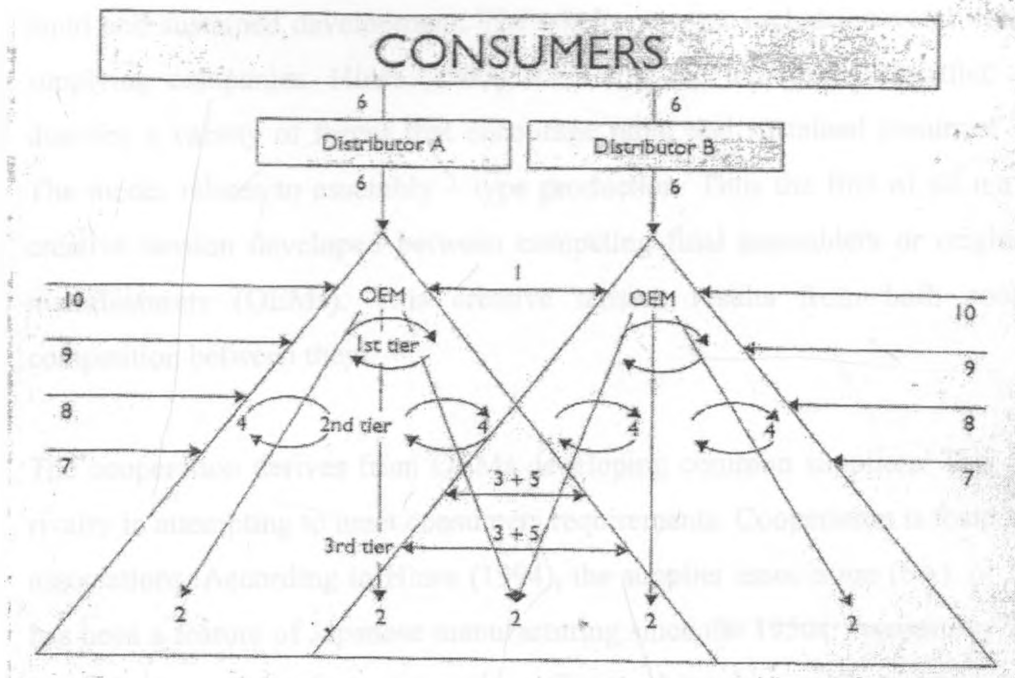
1. Creative tension between cooperation and competition, perhaps between different industrial sectors.
2. Supply chain development and OEM (Original Equipment Manufacturer) development by equitable profit feedback benefits.
3. Cross-network benefit spread effect.
4. *Kyoryoku kai* internal subcontractor development.
5. Inter-supplier rivalry to find a favoured network position.
6. The consumers changing needs and tastes
7. New entrants
8. Substitutes
9. Government agencies creating a developmental environment.

According to Lysons and Farrington (2006), the macro ten forces partnership model as shown in figure 2.3 above, widens the analysis from that of a company with a single source to the whole range of supply pipelines and identifies the forces that encourage rapid and sustained development. The whole network includes several tiers or layers of supplying companies. Hines (1993) states that the ten forces identified in figure 2.3 describe a variety of forces that encourage rapid and sustained continual development. The model relates to assembly – type production. Thus the first of all ten forces is the creative tension developed between competing final assemblers or original equipment manufacturers (OEMs). This creative tension results from both cooperation and competition between them.

The cooperation derives from OEMs developing common suppliers. The competition is rivalry in attempting to meet consumers requirements. Cooperation is fostered by supplier associations. According to Hines (1994), the supplier association (SA), or *Kyoryoku kai*, has been a feature of Japanese manufacturing since the 1950s. Assisted by *Kyoryoku kai*, large Japanese manufacturers such as Toyota have been able to both coordinate and develop their sub contractors in such ways as the dissemination of best practice, provision of technical assistance and, in some instances, training. Supplier associations also help to develop a climate of trust between the parties involved.

Hines and Rich (1998) define a supplier association as:

> "A mutually benefiting group of company's most important suppliers brought together on a regular basis in order to achieve strategic and operational alignment through the development of awareness, education and implementation programmes designed to achieve both radical and incremental improvements".

2.3.3 Important Features of Hines Model

Lysons and Farrington (2006), point out the four important features of the Hines model. The value chain points in the opposite direction to that in Porter's model, emphasizing differences in both objectives and processes. Secondly, Demand is determined by

collective customer defined price levels. Thirdly, primary functions in each of the separate firms in the value chain must be integrated and traditional arms length external barriers and internal divisions broken. The emphasis is on collaboration rather than competition. Lastly, the key primary functions and secondary activities differ as shown in table 2.1 below and there is significance of each of the secondary activities identified by Hines as explain earlier. Table 2.1 therefore gives a summary of the main contrasts between the Porter and Hines model.

Table 2.1:   Porter's and Hines's Models Contrasted.

parameters	Porter's model	Hines's model
Principal objectives	profitability	Consumer satisfaction
processes	'Push' system	'Pull' system
Structureanddirection	Series of chains linking firms pointing from raw materials source to customer	One large flow pointing from consumer to raw materials source.
Primary activities	Inbound logistics, operations, outbound logistics, marketing& sales and service	Teams concerned with marketing,materials,engineering, quality, R&D and design.
Secondary (support) Activities	Firm infrastructure HRM, technology development, and procurement	Activity-based costing (ABC), HRM/Training/Education, TQM, EDI, Profit

Source: Lysons, K. & Farrington, B. (2006), Purchasing and supply chain management. 7th Ed. Pearson Education Limited, Prentice Hall, pg. 105.

2.4   Value Chain Analysis

Value chain analysis is concerned with a detailed examination of each subsystem in a supply chain and every activity within these subsystems with a view of delivering maximum value at the least possible total cost, therefore enhancing value and synergy throughout the entire chains (Lysons and Farrington, 2006). Pearce and Robinson (1997) indicate that value chain analysis is based on the assumption that a business's basic purpose is to create value for users of its products or services. Therefore in value chain analysis, managers divide the activities of their firm into sets of separate activities that add value. Their firm is viewed as a chain of value- creating activities starting with procuring, raw materials or inputs and continuing through design, component production,

manufacturing and assembly, distribution, sales, delivery and support of the ultimate user of its products or services.

According to Johnson and Scholes (2002) value chain analysis describes the activities within and around an organization and relates them to an analysis of the competitive strength of the organization. Pearce and Robinson (1997) further adds that each of these activities can add value and each can be a source of competitive advantage. Porter (1985) states that there are two ways in which an enterprise can obtain a sustained competitive advantage: first cost and second differentiation.

2.4.1 Cost Strategies

According to Lysons and Farrington (2006), cost analysis with regard to value chains is performed by assigning costs to the value chain activities. The approach of activity-based costing is as of particular relevance in this, context. Thompson *et al* (2007) regards ABC as a tool for assessing a company's cost competitiveness. He asserts that once a company has developed good estimates for each of the major activities in its value chain and perhaps has cost estimate for each of the major activities in its value chain, sub-activities within each primary /secondary value chain activity, then it is ready to see how its costs for these activities compare with the costs of rival firms. Porter identifies ten major cost drivers that determine the value or cost of activities.

Economies or diseconomies of scale; the bigger the size of firm's operations, the less it costs the firm to produce as long as the firm operates within an optimal level of production capacity. If the firm utilizes its capacity better than its competitors it will benefit by having a lower per unit cost of production as it spreads its fixed cost over a wide or larger number of output. The results can be translated into higher margins or cheaper products.

Learning & Spillover; there is a cost in learning of new processes and training new staff. A firm that has a steep learning curve compared with the competition will have a lower cost related to learning than its competitors. These will mean that the firm with a shorter learning curve will attain higher efficiency levels faster than the competition. High efficiency results to better product quality and reduced wastage. These have a direct implication on cost reduction.

Capacity Utilization; changes in production capacity have the impact of either contracting or expanding costs. Idle capacity has its own cost due to the unabsorbed fixed cost that go to waste. A firm that can effectively utilize its idle capacity will benefit from increased output and a reduced per unit production cost. This is directly related to the economies of scale discussed above. Linkages between activities; activities within a firm are interrelated, the stronger and relevant the linkages between different activities the better for the firm. This is because of the synergies that are realized. If a firm can interlink its various activities much better than its competitors the firm will have reduced cost per activity and a higher benefit per activity.

Interrelationships among Business Units; a firm with different business units will benefit from a closer relationship among the units as opposed to the firm with a less tight relation. This is as a result of the synergies that such a close relationship will bring to the firm. Good interrelationships will reduce duplication of tasks and afford specialization of duties. This will result to reduced cost and if a firm does this better than its competition then it will gain strategic advantage.

Degree of Vertical Integration; a firm's ability to integrate vertically with its suppliers of inputs such as raw materials and control and manipulate these integrations towards its advantages will afford the firm a strategic advantage over its competitors. Timing of Market Entry; a firm that plans its market entry strategies to be at the most opportune time will reap a competitive advantage than firms that don't have such plans. Firm's policy of cost or differentiation; the policies followed by a firm will also affect the costs incurred by the organization in running its operations. A firm may either choose to follow a cost strategy or chose to use a differentiation strategy. The choice a firm makes is

usually a trade-off between the two strategies. Geographic Location; a firm that is located near its market, near its suppliers of inputs and near other support services has a competitive advantage compared to firms that are located far from all the above. Institutional factors; these include government regulations, taxation, unionization tariffs and levies which constitute major cost drivers

Lysons and Farrington (2006) states that, an enterprise that controls the above drivers better than its rivals will secure a competitive advantage over them. Porter (1985) continues to state that a cost advantage can also be gained by reconfiguring the value chain so that it is significantly different from those of competitors. Such reconfigured chains can derive from differing production processes, automation, direct instead of indirect sales, new raw materials or distribution channels and shifting the location of facilities relative to supplier and customers.

2.4.2 Differentiation Strategies

Porter (1985) states that a firm differentiates itself from its competitors when it provides something unique that is valuable to buyers beyond simply offering a new price. A differentiation advantage can be obtained either by enhancing the sources of uniqueness or reconfiguring the value chain. The drivers of uniqueness are often similar to the cost drivers listed in the earlier section. Policy choices; policy choices about activities to perform and how to perform them, such as what product features to include, services to provide, technology to employ or quality of outputs. Linkages between activities; Linkages between activities such as delivery time, which is often influenced not only by outbound logistics but also by the speed of order processing. Timing; Being the first to adopt a product image may pre-empt others doing so. Location; convenience of use of customers and other such factors. Interrelationships: This involves the sharing of technologies or sales effort.

Learning and spill over; Learning how to perform an activity better. Porter observes that only proprietary learning leads to sustainable differentiation. Integration; providing a service in-house instead of leaving it to supplier may mean that the organization is the only one to offer the service or provide the service in a unique way. Scale; Large-scale operations can allow an activity to be performed in a unique way not possible at a smaller volume. Institutional factors; Good union relationships may avoid losses in production time due to strikes and so on. Lastly, reconfiguring a value to create uniqueness can involve devising a new distribution chain or selling approach, forward integration to eliminate channels of distribution, backward integration to enhance quality and the adoption of new production technologies (Lysons & Farrington, 2006).

2.4.3 The Main Steps in Value Chain Analysis

Porter (1985) provides a list of the main steps in strategic cost analysis and differentiation analysis. Identification of the appropriate value chain activities and assigning costs and assets to them; diagnosing the cost drivers of each value activity and how they interact; identification of the competitor's value chains and determination the relative costs to competitors and the sources of cost difference; development of a strategy to lower your relative cost position by controlling cost –divers of reconfiguring the value chain and /or down stream value; ensuring that cost reduction efforts do not erode differentiation or make a conscious choice to do so and testing the cost reduction strategy for sustainability.

2.5 The Value Chain and Competitive Advantage

According to Porter (1985), Competitive advantage stems from many discrete activities that a firm performs. Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation. The firms' margin or profit depends on its effectiveness in performing activities effectively, so that the amount that the, customer is willing to pay for the products excess the cost of activities in the value chain. It is in these activities that a firm has the opportunity to generate superior value. A competitive advantage may be achieved by reconfiguring the value chain to provide lower costs or better differentiation.

Odero (2006) captures the idea that a firm is a series of functions and that analyzing how each is performed relative to competitors can provide useful insights. The value chain model can be used to define a firm's core competency and the activities in which it can pursue a competitive advantage through cost advantage and differentiation. What a business undertakes is directly linked to achieving competitive advantage. For instance, a business which wishes to outperform its competitors through differentiating itself through higher quality will have to perform its value chain activities better than the opposition. By contrast, a strategy based on seeking cost leadership will require a reduction in the costs associated with the value chain activities or a reduction in the total amount of resources used.

2.6   Theoretical Framework

Adoption of the Hines's value chain model is guided by variables according to the value chain parameters, system of the supply process applied, structure and direction being guided by the model, primary activities and secondary activities which should determine the principal objective of the model as the key parameter. The system of the supply process of the Hines's value chain model should show a 'pull' system where by the customer is the determinant of what should be offered therefore the supply is on need basis of the customer. The structure and direction of the Hines's value chain model should be one large flow pointing from consumer to raw materials sources. In this case the definition of the product value and volume starts from the customer so that the product is made according to the customers' specification and thus the direction of the model starts from consumer, customer chain, outbound logistics, supplier chain and ends with the raw materials source.

The primary activities of the Hines model should be based strongly on different teams such as marketing team, materials team, engineering team, research and development team and design team. All these teams are supposed to work together jointly to define product value at each stage. In addition the primary functions must be integrated. All external barriers and internal divisions must be broken down and there should be collaboration rather than just competition among these teams.

Lastly in the secondary activities the Hines's value chain emphasizes on the utilization of concepts like activity based costing system which enables the non value adding problems to be identified first and addressed promptly by allocating costs to activities rather than functions: knowledge creation through human resource management, training or education to the employees which facilitates effectiveness, efficiency and proactive thinking; Total quality management to provide a culture for all the network members; electronic data interchange to facilitate quick response to customer requirements and lastly profit should be equalized between network members which should result from reducing total production and consumption costs to below what consumers are willing to pay for product meeting their specifications. When an organization practices are according to the Hines value chain specification defining the various parameters then the principal objective which is consumer satisfaction is achieved. However the level of this satisfaction is dependent on the extent to which these practices relating to the parameters have been implemented

2.7 The Conceptual Framework

The figure of the conceptual framework is as shown in figure 2.4.

Fig: 2.4 The Conceptual Framework

Parameters defining the value chain	Aspects of the Hines's value chain model defining the parameters.	Principle objective of the Hines model

System of the supply process	'Pull' system	
Structure and direction	One large flow pointing from consumer to raw material Source.	
Primary activities	Teams concerned with marketing, materials. Engineering, quality research & development and design.	Consumer satisfaction
Secondary activities	Utilization of concepts like activity based costing, knowledge creation, total quality management, electronic data interchange and profit (i.e. equalization of profit between network members).	

CHAPTER THREE: RESEARCH METHODOLOGY

3.1   Research Design

This research adopts a descriptive case study design intended to establish the extent to which KEMSA has adopted the Hines's value chain model, outline challenges associated with adopting the model in supplying essential drugs to most PHFs in the country and also identify benefits of adopting the model as compared to the Porter's model initially adopted by KEMSA in supplying all the PHFs in the country.

According to Cooper and Schindler (2003), a study concerned with finding out who, which, when, where, and how of a phenomenon is a descriptive design. This study is thus mapped on a similar concern. The case study method was chosen because it gives an in-depth understanding of the behaviour pattern of firms. By using case studies, researchers are also able to collect data and explain phenomenon more exhaustively. Previous studies that have adopted this design successfully include: Karoney (2008), Odero (2006) and Koigi (2002).

3.2   Data Collection

The primary data was collected using an interview guide (appendix II). Self introduction to the respondents on the issue of concern was made through an introductory letter (appendix I). The respondents were persons who make strategic decisions at KEMSA from the core function departments. The interview guide was divided into three parts:

Part I has questions aimed at establishing the extent to which Hines value chain model has been adopted by KEMSA in respect to the value chain parameters that constitute the model which are: supply process, structure and direction, primary activities and secondary activities. Part II has questions focusing on the challenges associated with the adoption of the Hines 's value chain model and also identify the benefits of adopting the model as compared to the Porter's model which KEMSA had initially adopted in supplying all the PHFs in the country. Finally, part III contains questions about the general information of the respondent.

Secondary data was also collected from various sources including standard operating procedures manual from KEMSA, National Health Sector Strategic Plan and KEMSA's website. The secondary data on value chain was collected from the two main scholars given, Michael Porter and Peter Hines only.

3.3   Operationalizing Value Chain Model Parameters

The operationalization of the key constructs adopted for the study is as shown in Appendix III. The in-depth interview guide used unstructured questions to find out the extent to which KEMSA has adopted the Hines's value chain model in dealing with the supply of essential drugs to the public health facilities in Kenya

3.4   Data analysis

Primary data from all the sections of the interview guide was analyzed using content analysis. The content analysis is suitable for analyzing this qualitative data received because it helps in obtaining detailed and in-depth information from the qualitative data received.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1   Introduction

This chapter sets out to analyze and discuss the primary data that was gathered from respondents. The chapter is divided into three parts according to the objectives that guided the study. The first part focused on the extent to which KEMSA has adopted the Hines's value chain model in dealing with the supply of essential drugs to the PHFs; the second part has focused on the challenges associated with the adoption of the Hines's value chain model and the third part is on the benefits of adopting the model as compared to the Porter's model initially adopted by KEMSA in supplying all the PHFs in the country.

The primary data was collected from three key managers of the core function departments at KEMSA who are involved in the strategic management decisions of the organization. The respondents have worked for KEMSA for two to over five years. Because of their varied nature of responsibilities and the years of service, they have a thorough knowledge about the adoption of the Hines's value chain model because it was implemented two years ago. Each response from the respondents was analysed for content; that is relevance, strategic impact and confirmation by at least one other respondent.

4.2   Extent of Adoption of the Hines's Chain Model by KEMSA

To determine the extent to which KEMSA has adopted the Hines value chain model ('pull' strategy) in dealing with the supply of essential drugs to the PHFs, the respondents were asked to describe the practices adopted by KEMSA in support of the 'pull' strategy according to the following value chain parameters.

4.2.1 System of Supply Process

The findings indicate that, the hospitals are supplied with the essential drugs on a Bi-monthly basis i.e. six times in a year while the rural health facilities are supplies four times in a year. The facilities are therefore supposed to order the quantities they require

according to this delivery schedule. However this system for placing orders is flexible on conditions when there are emergency orders following disease outbreaks, accidents and other related emergencies whereby urgent orders made on special requests are supplied to the requesting facilities as soon as the orders are received.

The lead time (the time between when you place an order and when it is served) was also a major issue for consideration in the supply process of KEMSA. Orders from all facilities are received at KEMSA at the beginning of the inventory cycle (time between two consecutive inbound deliveries). Therefore depending on the KEMSA's distribution schedule, the lead time per facility is not fixed because it depends on when the orders are received; however it takes a minimum of two weeks and at most a month.

Occasionally the customers (public health facilities) have presented complaints about drugs arriving in unsatisfactory conditions. However some measures taken by KEMSA to prevent reoccurrence of this fault include: thorough checking before loading, using forklifts when stacking and un stacking from the warehouse and at minimal times charging of transporters on all items delivered in unsatisfactory condition because this makes them follow the standard operating procedures effectively and efficiently.

4.2.2 Structure and Direction

From the findings, KEMSA is concerned with gathering information about customer needs and wants; they seek to understand customer responses to the style and mode of service delivery by carrying out customer satisfaction surveys annually (every financial year). The drugs provided by KEMSA consistently meet the health facility requirements and performance expectations to some extent but it depends on the level of the health care of the facilities. For instance, the rural health facilities can depend on KEMSA alone as the only supplier and even the hospitals that fully rely on the essential medicines list however most hospitals normally supplement what KEMSA does not supply by buying from the private pharmaceutical companies despite the fact that the drugs are priced higher than at KEMSA or other drug supplying organisations like Missions for Essential drugs supply (MEDS).

4.2.3 Primary Activities

The responses indicate that some of the primary activities that KEMSA has practiced in support of the 'pull strategy' include: procurement of drugs that are in good and safe packaging; KEMSA has a quality assurance department that is dedicated to ensuring safety and efficacy. In addition KEMSA does its purchases after a competitive tender process where various suppliers are required to tender their products openly.

Procurement of drugs which have reasonable expiry duration; KEMSA only receives commodities with at least 75% of their shelf-life left. Therefore this gives a long allowance to supply the drugs to the PHFs before their shelf life elapses if KEMSA is efficient in doing so .Supply of drugs at affordable prices to the public health facilities; KEMSA has been proven to have the best prices based on price surveys conducted by independent bodies e.g. United States Agency for international development (USAID). In addition at tendering KEMSA awards the lowest bidder with the best quality therefore ensuring affordable prices for the facilities. However KEMSA's role in procuring drugs in satisfactory quantities is limited because it depends on the ministry funding. In addition KEMSA doesn't concentrate on procuring drugs with new molecules in the market because KEMSA drugs are procured based on the Essential Medicines List (EML) and not based on the new molecules in the market.

4.2.4 Secondary Activities

Some of the secondary activities that KEMSA has practiced in support of the pull strategy according to responses include: involvement is training its employees on the 'pull' strategy. This training is not consistent because it is based on program of ministry of medical services (MOMS) charged on the activity. In order to enhance service delivery KEMSA has been empowering its employees through; in-house trainings on customer service on need basis ,comfortable remuneration, implementation of an efficient data base, taking responsive measures to ensure prompt responses to customer needs are handled by the efficient and reliable customer service department. Through this department customers may present their complaints online by filling an online customer complaints form. This information on arrival to the customer service department is

responded to immediately and the customers can log in to check their feedback. In addition, in case of any inquiry the other modes of contact are, telephone, email and also physical contact through field visits. It takes approximately 48 hours to respond to the customer complaints presented.

Assurance of addressing the customer complaints effectively and by the right customer personnel is ensured because KEMSA is 1S0 certified and use the standard operating procedures in closing customer complaints. In addition the National customer service manager ensures that the customer complaints are addressed effectively by doing a follow up. Measures taken by KEMSA to upgrade its procurement and supplies procedures on the basis of advancing technology include; adoption of the new enterprise resource planning (ERP) which is a computer system used to manage all company resources in the receipt completion and delivery of customer orders. This system has enabled KEMSA customers to place electronic orders.

KEMSA ensures that there is overall accuracy and security through monitoring and evaluating the procedures followed to deliver drugs to the public health facilities to some extent. This is ensured partly due to the fact that the vehicle transporting the drugs to the health facilities is fitted with a tracking device that can monitor a driver up to the facility. In addition the facility is required to sign a delivery note after the drugs have been off loaded. Finally, KEMSA reviews the performance levels of the 'pull' strategy at the end of every cycle and quarter to determine the areas of improvement.

4.3   Challenges Associated with the Adoption of the Hines's Value Chain Model

Since KEMSA adopted the Hines's value chain model two years ago. The adoption process has been faced with a number of challenges. The main challenges indicated by the respondents includes: due to staff turn-over at the facilities, KEMSA is required to keep training the new staff on the adopted strategy; Periodically the health workers are overburdened and as a result they submit irrational orders. For instance some health facilities order for too much than required hence having so many items expiring in their stocks before usage. Other facilities order for less than their daily patient capacity thus

having many emergency requests before the end of the inventory cycle. Other facilities fill the standard order form incorrectly thus at times resulting to ordering items that the facilities do not require.

4.4 Benefits of Adopting the Hines's Value Chain Model over the Porters Model

Since KEMSA adopts the Hines's value chain model ('pull' strategy) to deliver to the key health facilities in the country which constitute a third of the total health facilities, the responses indicate the major benefits associated with the adoption of this strategy as; First when the health facilities forward rational orders then they are able to order the required amounts thus reducing any wastage because no drugs are supplied in excess or under supplied. Secondly, the 'pull' strategy has solved the accountability problems of the 'push' strategy where by health facilities are responsible for the drugs that expire due to excess supply because they are responsible for ordering the quantities required at any given time. Lastly, the Hines's value chain model is geared towards enhancing customer satisfaction, an objective which could not be met while operating under the 'push' strategy (Porter's model).

4.4.1 Drawbacks of the Porter's Value Chain Model

Initially, KEMSA adopted the Porter's value chain model ('push' strategy) to supply all the health facilities in the country. However two years ago, KEMSA found the need to adopt the Hines's value chain model ('pull' strategy) because of the following drawbacks of the 'push' strategy revealed by the findings of this study; The push strategy results to over supply or under supply of drugs to the health facilities because under this strategy all the facilities are supplied with similar quantities of drugs where by a standard kit is provided to the facilities irrespective of their geographical location. For instance, some diseases are unique to certain geographical zones and therefore when all regions receive this standard kit to some facilities this leads to the expiry of the drugs before their usage which is total wastage or it may cause a shortage of the drugs due to inadequate supply.

On the other hand, some facilities receive oversupply or under supply of drugs due to population distribution factors. The fact that some facilities will receive more patients

than others. Those facilities receiving a large number of patients suffer a shortage of the drugs thus causing a great dissatisfaction to the health providers and eventually the patients. Those facilities receiving a smaller number of patients experience wastage of the drugs due to excess supply. In addition the 'push' strategy has brought accountability problems of the drugs because once the health facilities are supplied with what they do not need they are not accountable for the losses incurred after the excess drugs have expired since they were not responsible for ordering the quantities supplied in excess.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The objectives of this study were first, to establish the extent to which KEMSA has adopted the Hines's value chain model in dealing with the supply of essential drugs to the PHFs; secondly, to determine the challenges associated with the adoption of the Hines's value chain model and lastly to identify the benefits of adopting the Hines's value chain model as compared to the Porter's model that was initially adopted by KEMSA in supplying all the PHFs in the country. To address these objectives this chapter discusses the findings based on the analysis of data in chapter four and in addition possible recommendations and conclusions about the study.

5.2 Summary

This section provides a summary of the major findings of the study. As discussed under the research problem, this study sought to fill gaps in previous studies which entailed providing an insight to the adoption of the value chain models by a given firm by establishing the extent to which the firm has adopted the value chain model and the challenges and benefits associated with the adoption of a particular value chain model.

By identifying and outlining gaps in previous study, this study departed from previous studies by introducing the concepts of practices relating to the value chain parameters that differentiates the two major models referred to in this study i.e. the Hines's and Porter's value chain model and thus explain the extent to which the organization has adopted the Hines's value chain model in relation to the parameters i.e. system of the supply process, structure and direction, primary activities, secondary activities and the principal objective.

For the supply process parameter, the overall responses indicates that KEMSA's practices in supplying drugs indicating a pull system are: The availability of a well coded standard order form which is issued to all the public health facilities scheduled to be supplied

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under the pull strategy so that it can guide these facilities in placing the orders; The flexibility of the ordering system whereby besides the schedule that indicates hospitals should order six times in a year and rural health facilities four times in a year, in case of emergencies the Health facilities can place special orders and measures have been taken to address the complaints about drugs arriving the health facilities in unsatisfactory conditions. Apart from these practices describing the supply process, a final practice which is determination of lead time was a point of concern because according to responses, the lead time per facility is not fixed because it depends on when the orders are received however it takes a minimum of two weeks and at most a month.

The structure and direction of the Hines's value chain model is ought to be one large flow pointing from consumer to raw materials source. In this case the definition of the product value and volume starts from the customer so that the product is made according to the customer's specifications thus directing the model to start from consumer and end with the raw materials. According to the findings, customer satisfaction surveys are conducted annually by KEMSA that help the organization to determine the satisfaction levels of the health facilities and also find out the current needs of the customers. In addition, the performance expectations of some health facilities are met. For instance, the rural health facilities due to the level of health care provision, they can fully depend on KEMSA as the main supplier however district and provincial hospitals offer a more advanced level of health care and in some instances some drugs needed may have to be sourced from private pharmaceutical companies or MEDS in addition to those supplied by KEMSA.

Responses have also shown that the primary activities practiced by KEMSA in support of this strategy include: procurement of drugs that are in good and safe packaging;, procurement of drugs that have a reasonable expiry duration i.e. they are procured with at least 75% of their shelf life left however from the respondents, there was no specification to the shelf life period left to the drugs being supplied to the public health facilities. KEMSA has been proven to have the best prices based on price surveys. Lastly, KEMSA's role in procuring drugs in satisfactory quantities is limited because it depends on the ministry funding.

The respondents indicated that KEMSA also practices some secondary activities in support of the pull strategy like: training of employees on the pull strategy though its not consistent because it is dependent on the program of MOMS charged on the activity, empowerment of its employees to enhance service delivery; implementing measures to ensure prompt responses to customer needs and also ensuring that the customer complaints are addressed effectively and by the right personnel. KEMSA is also keen to upgrade its procurement and supplies procedures on the basis of advancing technology e.g. adopting of the new enterprise resource planning system that has helped in management of organization resources in the receipt, completion and delivery of customer orders. In addition KEMSA has also fitted their vehicles for transporting the drugs to the facility with tracking device to assist in security purposes and also monitoring and evaluation process of the deliveries being made to the health facilities.

The process of adopting the 'pull' strategy at KEMSA commenced two years ago. Some of the challenges associated with its adoption include: due to staff turnover at the health facilities, KEMSA keeps training the new staff on the adopted strategy; some health workers are over burdened and as a result end up submitting irrational orders. However, the 'pull' strategy has been beneficial to KEMSA in that; since the facilities order for drugs that they require there is reduction of wastage caused by overstocking and also problems of shortages are solved because of reduced instances of under stocking, the facilities are therefore held accountable of what they order. As a result of these issues then there is enhanced customer satisfaction, an objective which could not be met under the 'push' strategy that was initially used in supplying all the PHFs. Therefore there was need to adopt the 'pull' strategy because of the following drawbacks of the 'push' strategy. The overstocking or under stocking the public health facilities because drugs are not supplied on need basis and in addition in case of any wastage due to excess supplies made, the health facilities are not accountable for them since they are supplied without ordering. All these problems trickle down the patients by increasing dissatisfaction thus the strategy does not enhance customer satisfaction.

5.3 Conclusion

As indicated in chapter one, in the pharmaceutical industry the health facilities are viewed as customers of this industry. This is because the health facilities rely heavily on the drugs and medical equipments for the diagnosis and clinical management of the patients. It is therefore imperative for the suppliers of the drugs and medical equipments to attend to the needs of the health facilities to their satisfaction as any inefficiency in the supply process will result in inefficiency in patient treatment which eventually results in dissatisfaction to the hospital pharmacists, doctors and patients (Hamid, Bakar & Hakim, 2010). Conclusions drawn from the study of the application of the Hines's value chain model by KEMSA may point at the key areas that require management's attention because the process of adopting the Hines's value chain ('pull' strategy) is on going.

Results of the study suggest that overall adoption of the 'pull' strategy is to a moderate extent. This is because out of the public health facilities that are supplied by KEMSA, one third of these health facilities are supplied using the 'pull' strategy but they mainly consist of the key health facilities because all district and provincial hospitals are in this category. The remaining portion which is two third mainly consists of the rural health facilities that are still being supplied using the 'push' strategy (Porter's value chain model).

The one third portion of the health facilities where the adoption of the 'pull' strategy has taken place, responses shown that KEMSA has effected the strategy in all the significant parameters these are; system of supply process which clearly indicates that it's a pull system as shown by the practices. However in this parameter the researcher was concerned about the lead time (The time between when you place an order and when it is served) results shown that it takes a minimum of two weeks and at most one month.

About the structure and direction, the findings suggest that KEMSA has also implemented some measures of ensuring that the direction points from consumer to the organization. However, in this parameter as revealed by the study some performance expectations of some health facilities are not met exhaustively because some of the

facilities cannot rely on KEMSA as the only supplier of the drugs and therefore may have to supplement the orders by ordering some drugs from private pharmaceutical companies which price their drugs at a higher price than KEMSA or MEDS.

The primary activities supporting the 'pull' strategy have also been adopted by KEMSA however the study revealed that KEMSA has not put conditions of drugs being supplied to have a specific percentage of shelf life left. Though the specification made on procuring drugs with a 75% shelf life left is reasonable if the drugs are dispatched effectively. In addition the role of quantification is limited because KEMSA relies on the ministry for funding thus this affects the effectiveness in ensuring product availability. Most of the practices supporting the secondary activities of the 'pull' strategy have been adopted effectively by KEMSA. However the study also shown that the management could expound on their role of ensuring employee participation and empowerment in order to enhance service delivery.

The study also sought to find out the comments about a report in citizen TV reported on Sunday 28th March 2010 during 1.00pm news where Malindi hospital which is among the public health facilities supplied by KEMSA was faced with a severe lack of essential drugs .In response to this, the respondents said there had been a drug shortage at KEMSA due to lack of finances to procure the drugs. KEMSA put the blame on the ministry of health because it is their role to provide funding.

The responses also shown that despite the fact that the 'pull' strategy has not been adopted fully to the organization, it was the preferred strategy because of enhancing customer satisfaction and they also pointed out that the right decision was made by adopting the 'pull' strategy instead of continuing with the initial 'push' strategy and that the organization has future plans for adopting the pull strategy to the health facilities that are still being supplied using the 'push' strategy.

Lastly, the respondents also pointed out that the effectiveness of this preferred strategy 'pull' will be enhanced by having all the players in this process playing their role effectively i.e. the public health facilities, KEMSA and the ministries (ministry of medical service and ministry of public health and sanitation). However, according to Pitta and Laric (2004), the supply chain of the health care industry is different from the manufacturing sector in terms of the level of customization of services provided, the degree of participation of a partner or consumer and the uncertainty underlying the basic process. As such, the healthcare providers are unable to predict patient mix and the demand for a particular item. This explains why they are unable to control or project their projection schedules (Jarrett, 1998). This is true enough in the current context where doctors request services from clinical laboratories or request drugs from the hospital pharmacy according to the current needs of the patients and therefore it may be expected by KEMSA for the pull strategy to continue facing the challenges of receiving irrational orders from the public health facilities from time to time because according to Evans and Berman (2001) the healthcare value chain is more dynamic and complex and this significantly impacts on the performance measurement of the healthcare organizations.

5.4   Recommendations

This study has revealed the extent to which KEMSA has adopted the Hines's value chain model ('pull' strategy) in dealing with the supply of drugs to the public health facilities. As the study focused on the various parameters of the value chain model; system of supply process, structure and direction, primary activities and secondary activities; from the responses the practices in relation to these parameters supporting the pull strategy have been effected but the analysis of the specific practices under each parameter revealed a number of possible value chain aspects that may be improved.

First, in respect to the system of supply process the study suggest that the lead time (time between when you place an order and when it is served) is dependent on the distribution schedule whereby the lead time per facility is not fixed but depends on when the orders are received. However it takes a minimum of two weeks and at most a month. The researcher recommends measures to reduce the lead time can be adopted by KEMSA

since lead time is the production or service time (value added activity) + Non-value added time. According to Lysons and Farrington (2006) supply process activities fall into four categories which are first, production or service time (value added activity). Secondly, inspection time that is performing quality control (non-value added activity), thirdly transfer time, that is movement of products or components (non-value added activity) and fourth is idle time, that is storage time or time wasting during production process (non-value added activity). Therefore as KEMSA work towards reducing the lead time, concentration should be focused to illustrate any activities categorized in second, third or fourth category because elimination of a non-value adding activity leads to enhanced service delivery.

Secondly, in respect to structure and direction, the findings of the study suggest that the drugs provided by KEMSA consistently meet the health facility requirements and performance expectations to some extent whereby it depends on the level of the healthcare of the facilities. The rural health facilities due to their level of health care, they can depend on KEMSA as the only supplier of the drugs. However some district and provincial hospitals due to the higher level of healthcare provision than the rural health facilities they may have to order some drugs from the private pharmaceutical companies or even MEDS in order to run effectively.

The researcher recommends that since the procuring of drugs by KEMSA is based on the Essential Medicines List (EML) then KEMSA may have to revise the EML list in order to include all drugs that meet the performance expectations of all the health facilities fully despite their level of health care provision. In respect to customer expectations, Ferrel and Michael (2008), clarifies that in order to maintain and manage customer satisfaction from a strategic point of view, managers must understand customer expectations and the differences between satisfaction, quality and value. They must also make customer satisfaction measurement a long–term, continuous commitment of the entire organization.

Ferrell and Michael further adds that, although customer satisfaction can be conceived in a number of ways, it is typically defined as the degree to which a product meets or exceeds the customer's expectations about that product. Therefore the key to this definition lies in understanding customer expectations and how they are formed. Marketing researchers have discovered that customers can hold many different types of expectations like; ideal expectations, normative expectations, experienced based expectations and minimum tolerance expectations.

Thirdly, in respect to the primary activities the findings indicate that KEMSA's role in quantification, that is ensuring product availability in the required quantities at all times is limited because it is dependent on the ministries funding. The research recommends that in order for the pull strategy to be effective as suggested from the findings, then all the players in this process ought to play their role effectively and in this case the ministries of medical services/public health and sanitation is one of the major players besides KEMSA and the health facilities.

Finally in respect to the secondary activities, most of the practices by KEMSA in support of the pull strategy have been adopted effectively however the researcher recommends that the management may expound on their role of ensuring employee participation and empowerment in order to enhance service delivery. According to Aswathappa (2008), an important reason for encouraging greater employee participation in decision making is that it can lead to improved efficiency and effectiveness in delivering of goods and services to the customers, it enhances the ability of the employees to make important operational decisions, it leads to increased employee commitment and motivation and enhanced customer satisfaction.

Aswathappa (2008) identifies some empowerment techniques as being employee consultation during decision making, employee job enrichment by giving them greater discretion over immediate work decisions since this adds to their motivation by increasing their responsibility for their work output of increasing job interests, empowerment through delegation because a participative management style that

encourages delegation of authority implies that all employees will be encouraged to play a part in the decisions affecting their work, work councils whereby essential joint bodies of managers and employees are established to consider and agree on key matters affecting employment within the organization and appointment of employees to non-executive directorships on the company's board is another indication of employee participation.

5.5 Limitations of the Study

Like many studies, the current study results were interpreted in light of certain limitations. A key limitation relates to the scope of the study. The study was limited to one drug supplier and this may mean that the study results may not be generalised to other suppliers like missions for essential drugs supply (MEDS) which is a faith based organization that supplies the mission hospitals in the country.

5.6 Suggestions for Further Research

Further research could be carried out in the public health facilities supplied by KEMSA with an aim of determining customer satisfaction levels with the supply process strategy that KEMSA has adopted. For instance it may be informative to conduct a wider customer satisfaction survey in the health facilities supplied using the 'pull' strategy. Such a study may provide more input into the supply process policy by KEMSA as well as provide insight to KEMSA into the aspects of service delivery that need improvement from the health facilities point of view. In addition further research could be carried out in MEDS with the aim of establishing the extent to which the organization has adopted the Hines's value chain model in dealing with the supply of essential drugs to the mission hospitals in Kenya.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

PHYLLIS KINANU MARETE
UNIVERSITY OF NAIROBI
DEPARTMENT OF BUSINESS ADMINISTRATION
P.O BOX 18882 -00100, NAIROBI

Dear Respondent,

RE: REQUEST FOR RESEARCH DATA

I am a post graduate student at the University of Nairobi, department of Business Administration.

In partial fulfilment of the requirement for the degree of master in Business Administration (MBA), 1 am undertaking a management research project entitled; *"Application of the Hines value chain model by The Kenya Medical Supplies Agency"* I therefore kindly request you to assist me in filling the attached questionnaire. The information provided will be used exclusively for the purpose of this research and will be treated in strict confidence.

Your co-operation will be highly appreciated.

Yours faithfully

PHYLLIS KINANU MARETE
MBA STUDENT
UNIVERSITY OF NAIROBI

APPENDIX II: INTERVIEW GUIDE

This interview guide is designed to assess the application of the Hines's value chain model by the Kenya Medical Supplies Agency in dealing with the supply of essential drugs to the public health facilities.

OVERALL ISSUES

I.   To what extent has KEMSA adopted the Hines's value chain model ('Pull' Strategy).

II. What are the challenges associated with the adoption of the 'Pull' Strategy?

III. Considering that KEMSA adopted the pull strategy two years ago; how is this strategy more beneficial than the push strategy? What are the draw backs of using the push strategy and which reasons triggered KEMSA to introduce the 'Pull' Strategy?

Part I

1. Are you familiar with the 'pull' strategy that KEMSA is using in the supply of essential drugs to the public health facilities in Kenya?

2. If Yes in (1) above, which practices has KEMSA adopted in support of the 'pull' strategy according to the following value Chain parameters?

   a) **Supply Process**

   i)   Is the system for placing orders by KEMSA flexible? i.e. does KEMSA supply the public health facilities urgent orders made on special requests?

   ii) How often are the public health facilities supplied with essential drugs in a year?

   iii) How long does an order from the health facility take before the drugs are delivered?

   iv) Does KEMSA encounter any customer complaints about drugs arriving in unsatisfactory conditions? If yes, what measures have been taken to prevent reoccurrence of the fault?

b) Structure and Direction

i)   Are there measures undertaken by KEMSA for gathering information about customer needs?

ii)   Does KEMSA seek to know by seeking to understand customer responses to the style and mode of service delivery by carrying out customer satisfaction surveys? If yes, how often?

iii)   Are the drugs provided by KEMSA consistently meeting the health facility requirements and performance expectations?

c) Primary Activities

To what extent has KEMSA been involved in efficiency and effective handling of the following activities?

i)   Procurement drugs that are in good and safe packaging.

ii)   Procurement of drugs with new molecules in the market.

iii)   Procurement of drugs in satisfactory quantities (ensure product availability).

iv)   Procuring and supplying drugs that have reasonable expiry duration.

v)   Supply of drugs at affordable prices to the Public Health Facilities.

d) Secondary Activities

i.   Does KEMSA carry out employees training on the 'Pull' Strategy? If yes, how often?

ii.   In what ways has KEMSA empowered its employees in order to enhance service delivery?

iii.   What measures have been taken by KEMSA to ensure prompt responses to customer needs?

iv.   Does KEMSA review the performance levels of the 'Pull' strategy to determine the areas of improvement? If yes how often?

v.   Which mode of contact is available to the public health facilities in case of any inquiry (email, phone, fax etc)

vi.   Does KEMSA encounter any complaints from the customers? How long does it take to respond? Is there a follow up from the management to ensure the complaint was addressed effectively and by h right personnel?

vii. What measures has KEMSA taken to upgrade its procurement and supplies procedures on the basis of advancing technology? E.g. can the Public Health Facilities order for KEMSA drugs online? Has KEMSA provided information about their products, services and ordering procedures online?

viii. What measures has KEMSA taken in helping the public health facilities to be successful in providing the best services to the patients?

ix. What measures has KEMSA put in place in ensuring that there is overall data accuracy and security in the procedures followed to deliver the drugs to the Public Health Facilities?

3. Other than the practices mentioned, are there other practices the organization has adopted in support of the 'pull' strategy?

4. Evaluating the four value chain parameters which parameter(s) (Supply process, structure and direction, primary activities, secondary activities) do you think requires most improvement?

Part II

5(a) Considering that KEMSA adopted the 'pull' strategy two years ago, are there Challenges associated with adopting this strategy?

               Yes   No

(b) If yes in (a) above please outline the challenges experienced so far?

6(a) Since KEMSA adopts the 'pull' strategy to deliver drugs to all the major health facilities in the country and the 'push' strategy to deliver to just a few health facilities, are there benefits associated with the adoption of the 'pull' strategy because it's used more widely than the 'push' strategy?

               Yes   No

(b)If yes in (a) above, outline the benefits associated with the adoption of the 'pull' Strategy?

7. What are the reasons that triggered KEMSA to introduce   the 'pull' strategy?

8. Are there future plans for the adoption of the 'pull' strategy to the health facilities? that are still being supplied using the 'push" strategy?

9. (a) In your own opinion do you think the right decision was made by adopting the 'pull' strategy instead of continuing with the initial 'push' strategy?

                     Yes   No

(b) If yes in (a) above, what are the draw backs of using the 'push' strategy?

10. Which of the two strategies 'Pull' and 'Push' is geared towards enhancing customer satisfaction?

11. Comment about the effectiveness of this preferred strategy

12. Recently in the media, (Reported in Citizen TV on Sunday 28th March, 2010 during 1:00 p.m. news) Malindi hospital which is among the public health facilities supplied by KEMSA was faced with a severe lack of essential drugs. What are your comments about this issue?

Part III

General Information of the Respondent

13. Name (Optional)_____

14. Job Title _____

15. Department_____

16. How long have you been working for KEMSA.

      Less than 2 Years ( )

      2-5 Years   ( )

      Over 5 Years   ( )

APPENDIX III: OPERATIONALIZATION OF THE ADOPTION OF THE HINES'S VALUE CHAIN MODEL

Determinants of the extent of adopting the Hines's value chain model (value chain parameters)	Aspects of the Hines's value chain model defining the parameter	Relevant practices in support of the value chain parameter	Relevant question
Supply processes	Pull system	• Flexibility of the system for placing orders • Availability and coding of the standard order form • The approximate lead time (time between when an order is placed and when it is served) • Supply of drugs in satisfactory condition	2(a)
Structure and direction	One large flow pointing from consumer to raw materials source	• Carrying out customer satisfactory surveys to enhance service delivery • Meeting performance expectations of the customers through the style of service and products supplied.	2 (b)
Primary activities	Teams concerned with marketing materials engineering quality research and design	• Procurement of drugs that are in good and safe packaging • Procurement of drugs in satisfactory quantities • Procuring and supplying drugs that have reasonable expiry duration • Supply of drugs at affordable prices to the public health facilities • Procurement of drugs with new molecules in the market	2(c)
Secondary activities	Activity- based costing (ABC), Human Resource Management, Training/ Education Total quality	• Employee training on the pull strategy • Employee participation and empowerment • Ensure prompt responses to customer needs • Review of performance levels of the pull strategy to determine areas of improvement	2 (d)

	management, Electronic data interchange, profit	• Handling customer complaints effectively • Measures taken to upgrade procurement supplies procedures on the basis of advancing and technology • Measures taken by KEMSA in helping the PHFs become better service providers to the patients • Measures taken to ensure overall security in the procedures followed to deliver drugs to the PHFs	
Principal objective	Customer satisfaction	• Overall practices mentioned above in support of the supply process, structure and direction, primary activities and secondary activities	Q2 (a,b,c,&d) Q10

APPENDIX IV: PUBLIC HEALTH FACILITIES SUPPLIED BY

KEMSA

TYPE OF HEALTH FACILITY	TOTAL NUMBER IN THE COUNTRY
National Referral Hospital	2
Provincial General Hospital	7
District Hospital	70
Sub-District Hospital	96
Health Centres	642
Dispensaries	3170
Rural Health Demonstration Centres	10
Rural Health Training Centres	5
Grand Total	**4002**

Essential Medicines Standard Order Form (Hospitals)

KEMSA code no	Item description Name / form / strength	Order Unit Size	Unit Cost (Kshs)	Current Stock (units)	AMC (units)	Order Qty (units)	Order cost (Kshs)
Hospital		Order			Order		
a) Essential Medicines: Tablets and Capsules							
PHA0539	Acyclovir Tabs 400mg.	100's	320.93				
PHA0003	Albendazole tabs 400mg	1,000	1,285.00				
PHA0005	Amitriptylline tabs 25mg	1,000	168.00				
PHA0009	Amoxicillin caps 250mg	1,000	775.00				
PHA0385	Artemether/lumefantrine tabs 100/20mg	6	0.01				
PHA0386	Artemether/lumefantrine tabs 100/20mg	12	0.01				
PHA0387	Artemether/lumefantrine tabs 100/20mg	18	0.01				
PHA0388	Artemether/lumefantrine tabs 100/20mg	24	0.01				
PHA0001	Aspirin tabs 300mg	1,000	108.00				
PHA0415	Atenolol tabs 50mg	1,000	315.00				
PHA0021	Benzhexol tabs 5mg	1,000	262.10				
PHA0379	Calcium/Vit D_3 tablets 1g/200 IU	10	39.00				
PHA0026	Carbamazepine tab 200mg	1,000	820.00				
PHA0027	Carbimazole tabs 5mg	1,000	2,483.00				
PHA0036	Chlorphenamine tabs 4mg	1,000	56.17				
PHA0039	Chlorpromazine tabs 100mg	1,000	469.00				
PHA0432	Ciprofloxacin tabs 250mg	1,000	924.00				
PHA0436	Codeine Phosphate Tabs 30 mg	100	368.90				
PHA0048	Cotrimoxazole tabs 480mg	1,000	438.10				
PHA0374	Dexamethasone Tabs 0.5mg	1,000	45.00				
PHA0055	Diazepam tabs 5mg	1,000	81.00				
PHA0440	Diclofenac Sodium Tabs 50 mg	100	21.40				
PHA0239	Digoxin tabs 250mcg	500	3,692.00				
PHA0070	Doxycycline caps 100mg	1,000	631.31				
PHA0444	Enalapril Tabs 5mg	100	55.49				
PHA0073	Erythromycin tabs 250mg	1,000	1,376.00				
PHA0078	Ferrous sulphate tabs f/c 200mg	1,000	59.91				
PHA0079	Flucloxacillin caps 250mg	1,000	2,177.10				
PHA0554	Fluconazole Caps 50mg	100	186.87				
PHA0083	Folic acid tabs 5mg	1,000	48.00				
PHA0090	Glibenclamide tabs 5mg	1,000	123.00				
PHA0091	Haloperidol Tabs 5mg	1,000	1,561.21				
PHA0414	Hydrochlorothiazide tabs 50mg	1,000	181.04				
PHA0130	Ibuprofen tabs f/c 200mg (scored)	1,000	205.00				
PHA0331	Ketoconazole tabs 200mg	30	74.89				
PHA0143	Levothyroxine tabs 100mcg	100	275.00				
PHA0146	Loperamide caps 2mg	1,000	460.07				
PHA0148	Magnesium trisilicate co tabs	1,000	98.13				
PHA0549	Metoclopramide Tabs 10mg	100	48.00				
PHA0378	Metformin tabs 500mg	1,000	973.56				
PHA0155	Methyldopa tabs f/c 250mg	1,000	1,819.11				

Essential Medicines Standard Order Form (Hospitals)

KEMSA code no	Item description Name / form / strength	Order Unit Size	Unit Cost (Kshs)	Current Stock (units)	AMC (units)	Order Qty (units)	Order cost (Kshs)
PHA0159	Metronidazole tabs 200mg	1,000	273.34				
PHA0160	Multivitamin tabs	1,000	125.00				
PHA0166	Nifedipine tabs s/r 20mg	1,000	299.00				
PHA0493	Omeprazole caps 20mg	1,000	1,300.00				
PHA0332	Paracetamol tabs 100mg	1,000	64.00				
PHA0178	Paracetamol tabs 500mg	1,000	185.00				
PHA0182	Phenobarbitone tabs 30mg	100	20.00				
PHA0183	Phenytoin tabs 50mg	1,000	252.00				

KEMSA code no	Item description Name / form / strength	Order Unit Size	Unit Cost (Kshs)	Current Stock (units)	AMC (units)	Order Qty (units)	Order cost (Kshs)
	Essential Medicines Standard Order Form (Hospitals)						
PHA0038	Chlorpromazine inj 25mg/mL, 2mL amp	1*	4.00				
PHA0438	Cotrimoxazole Inj. 96mg/ml,5ml amp	1*	174.45				
PHA0050	Darrow's ½ strength IV infusion 500mL	1*	23.00				
PHA0375	Dexamethasone inj 4mg/mL, 1mL amp	1*	7.85				
PHA0051	Dextran 70/glucose 6%/5% infusion 500mL	1*	300.00				
PHA0054	Diazepam inj 5mg/mL, 2mL amp	1*	4.25				
PHA0348	Diclofenac inj 25mg/mL, 3mL amp	1*	3.88				
PHA0488	Digoxin Inj 50mcg/ml, 2ml amp.	1*	212.08				
PHA0082	Fluphenazine decanoate inj 25mg/1mL amp	1*	28.00				
PHA0085	Furosemide inj 10mg/mL, 2mL amp	1*	4.29				
PHA0087	Gentamicin inj 10mg/mL, 2mL amp	1*	2.85				
PHA0088	Gentamicin inj 40mg/mL, 2mL amp	1*	2.35				
PHA0052	Glucose infusion 5%, 500mL	1*	34.00				
PHA0421	Glucose infusion 10%, 500mL	1*	34.00				
PHA0053	Glucose injection 50%, 100mL	1*	34.50				
PHA0447	Haloperidol Decan. Inj. 50mg/ml, 1ml amp.	1*	160.00				
PHA0120	Heparin inj 5,000 IU/mL, 5mL vial	1*	80.00				
PHA0123	Hydralazine inj 20mg amp pfr	1*	99.80				
PHA0124	Hydrocortisone inj 100mg vial	1*	16.96				
PHA0412	Insulin biphasic 30/70 100 IU/mL 10mL vial	1*	418.00				
PHA0139	Insulin soluble, human 100 IU/mL, 10mL vial	1*	475.00				
PHA0142	Ketamine injection 50mg/mL, 10mL vial	1*	40.50				
PHA0145	Lidocaine inj 2% 30mL amp	1*	13.00				
DEN0020	Lignocaine/adren. dental cart 2% + 1:80,000	100	1,800.00				
PHA0287	Magnesium sulphate inj 50%, 10mL amp	1*	179.00				
PHA0357	Metoclopramide inj. 5mg/ml, 2ml amp.	1*	2.72				
PHA0156	Metronidazole inj 5mg/mL, 100mL vial	1*	18.80				
PHA0453	Morphine inj. 10mg/ml, 1ml amp.	1*	39.75				
PHA0163	Neostigmine methylsulph. 2.5mg/mL, 1mL amp	1*	13.50				
PHA0174	Oxytocin inj 10 IU/mL, 1mL amp	1*	12.06				
PHA0175	Pancuronium bromide inj 2mg/mL, 2mL amp	1*	36.12				
PHA0180	Pethidine inj 50mg/mL, 2mL amp	1*	31.00				
PHA0181	Pethidine inj 50mg/mL, 1mL amp	1*	30.00				
PHA0289	Phytomenad.inj (Vit K$_1$) 2mg/mL, 0.2mL amp	1*	80.00				
PHA0290	Phytomenad.inj (Vit K) 10mg/mL, 1mL amp	1*	56.00				
PHA0461	Pralidoxine Mesylate inj.(PAM) 200mg/ml, 1ml amp.	1*	1,900.00				
PHA0192	Quinine dihydrochloride inj 300mg/mL 2mL amp	1*	8.93				
PHA0351	Sod.stibogluconate inj 100mg/mL, 100mL amp	1*	7,125.00				
PHA0204	Sodium bicarbonate inj 8.4%, 10mL amp	1*	58.30				
PHA0169	Sodium chloride IV infusion 0.9%	1*	24.00				
PHA0094	Sodium lactate co IV infusion (Hartmann's)	1*	23.00				
PHA0217	Suxamethonium chloride inj 50mg/mL, 2mL amp	1*	24.00				
PHA0224	Thiopentone inj 500mg vial pfr	1*	39.08				
PHA0365	Vecuronium bromide 10mg vial pfr	1*	790.00				

Essential Medicines Standard Order Form (Hospitals)							
KEMSA code no	Item description Name / form / strength	Order Unit Size	Unit Cost (Kshs)	Current Stock (units)	AMC (units)	Order Qty (units)	Order cost (Kshs)
PHA0337	Vincristine suphate inj 1mg/1mL vial	1*	121.00				
PHA0229	Water for injection 10mL amp	1*	1.98				
d) Essential Medicines: External Medicines/Other Items							
NPH0138	Alcohol pre-injection swabs	200	0.00				
NPH00430	Atropine Sulphate eye drops 1%	5ml	190.00				
PHA0411	Beclomethasone inhal.100mcg/dose (200 doses)	1	400.00				
PHA0235	Benzyl Benzoate Application 25%	100ml	0.01				
PHA0280	Calamine Lotions 15 %	100ml	20.00				
PHA0029	Cetrimide/chlorhexidine soln 15%/1.5%	5L	681.00				
PHA0034	Chlorhexidine gluconate 5% soln (for dilution)	5L	690.00				
PHA0044	Clotrimazole cream 1%	20g	5.99				
PHA0045	Clotrimazole pessaries 100mg (+ applicator)	6	10.48				
PHA0147	Cresol/soap solution (Lysol)	5L	745.08				
PHA0069	Dispensing envelopes plastic resealable	10x1000	3,233.97				
PHA0446	Ethanol denatured 94%	5L	405.00				
PHA0338	Gentamycin eye Drops 0.3%	5ml	7.49				
PHA0093	Halothane inhalation	250mL	1,362.00				
PHA0248	Hydrocortisone ointment 1%	15g	15.00				
PHA0137	IV infusion giving set with air inlet	1	12.00				
PHA0186	Povidone iodine solution 10%	5L	850.00				
PHA0463	Salbutamol inhaler 100mcg/dose (200 doses)	1	135.42				
PHA0464	Salbutamol nebuliser soln 5mg/mL, 10mL vial	1	398.29				
PHA0465	Silver Sulphadiazine cream 1%	250g	90.00				
PHA0205	Sodium hypochlorite solution 4-6%	5L	220.00				
PHA0223	Tetracycline eye ointment 1% 5g tube	1*	8.70				
e) Reproductive Health Supplies (currently supplied at no cost under pull system)							
NPH0021	Condom, female	1	0.01				
NPH0022	Condom, male	1	0.01				
KIT0007	Depot Medroxyprogesterone acetate 150mg inj	Kit (1x100vials)	0.01				
PHA0255	Levonorgestrel implant 75mg	10's	0.01				
PHA0408	Etonogestrel Implant 68mg	1	0.01				
PHA0252	Implant insertion kit	Kit	0.01				
PHA0250	IUD Copper T	25's	0.01				
PHA0251	IUD insertion/removal kit	1	0.01				
PHA0241	Levonorgestrel/ethinylestradiol tab 0.15mg/0.03mg (COC)	1x21	0.01				
PHA0346	Levonorgestrel tab 30mcg (POP)	1x35	0.01				
PHA0263	Levonorgestrel tab 750mcg (EC)	2	0.01				
Total Order Value				Kshs			
Drawing Rights Available Balance				Kshs			
Prepared by (name/Pharmacist i/c)		Date		Signature			
Authorised by (name/MedSup)		Date		Signature			

Note: Items with a * against Order Unit Size may only be ordered in multiples of the KEMSA Minimum Order Size (MOS)

PHA0333	Praziquantel tabs 600mg	500	4,212.50				
PHA0187	Prednisolone tabs 5mg	1,000	297.24				
PHA0291	Quinine sulphate tabs 300mg	1,000	1,190.73				
PHA0201	Salbutamol tabs 2mg	1,000	52.42				
PHA0214	Sulfadoxine/pyrimethamine tabs 500/25mg	1,000	1,160.78				
PHA0225	Tinidazole tabs 500mg	1,000	475.58				
PHA0470	Zinc Sulphate Tabs 20mg	100	240.00				
b) Essential Medicines: Oral liquids							
PHA0011	Amoxicillin syrup 125mg/5mL	100mL	16.00				
PHA0330	Amoxicillin/clavulanic acid oral susp 228mg/5mL	70mL	146.00				
PHA0037	Chlorphenamine syrup 2mg/mL	2L	47.54				
PHA0046	Cotrimoxazole suspension 240mg/5mL	50mL	9.21				
PHA0487	Digoxin Oral Solution 100mcg/ml	100ml	1,402.21				
PHA0072	Erythromycin oral susp 125mg/5mL	100mL	38.05				
PHA0158	Metronidazole oral susp 200mg/5mL	100mL	16.00				
PHA0170	Nystatin oral susp 100,000 IU/mL	30mL	25.00				
PHA0173	ORS sachet for 500mL (new formula)	1*	2.77				
PHA0176	Paracetamol susp 120mg/5mL	5L	265.00				
PHA0200	Salbutamol oral solution 2mg/5mL	100mL	11.25				
c) Essential Medicines: Parenterals							
PHA0002	Adrenaline (epinephrine) inj 1mg/1mL amp	1*	3.30				
PHA0004	Aminophylline inj 25mg/mL, 10mL amp	1*	5.50				
PHA0017	Atropine sulphate inj 1mg/mL, 1mL amp	1*	4.00				
PHA0019	Benzathine penicillin inj 2.4 MU vial (pfr)	1*	14.40				
PHA0024	Benzylpenicillin inj 3g (5MU) vial (pfr)	1*	15.85				
PHA0025	Benzylpenicillin inj 600mg (1MU) vial (pfr)	1*	3.76				
PHA0429	Bupivacaine heavy spinal inj 5mg/mL, 4mL amp	1*	20.00				
PHA0285	Ceftriaxone inj 1g (pfr)	1*	41.19				
PHA0028	Ceftriaxone inj 250mg (pfr)	1*	21.70				
PHA0032	Chloramphenicol inj 1g (pfr)	1*	14.25				
PHA0035	Chlorphenamine inj 10mg/mL, 1mL amp	1*	3.00				