

**A SURVEY OF OPERATIONS MANAGEMENT PRACTICES  
APPLIED BY PHARMACEUTICAL COMPANIES IN KENYA.**

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## DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted for a degree in this or any other university.

Signature:  \_\_\_\_\_ Date: 12/11/2012

**Kennedy Onyango Owino**

The project has been submitted for examination with my approval as the University supervisor.

Kariuki C. Ngugi

Signature:  \_\_\_\_\_ Date: 12/11/12

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## **DEDICATION**

I dedicate this work to my wife, Adline Saru Onyango and my son, Lionel Hawi. You were the motivation that kept me going all through.

## ACKNOWLEDGEMENT

This dissertation would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this study.

First and foremost I give thanks to the Almighty and provident God, I thank him from the bottom of my heart for this wonderful opportunity to pursue my studies and this report is the result of his goodness towards me.

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## TABLE OF CONTENTS

DECLARATION .....	II
DEDICATION .....	III
ACKNOWLEDGEMENT.....	IV
TABLE OF CONTENTS .....	V
LIST OF TABLES.....	VII
LIST OF FIGURES.....	VIII
ABSTRACT .....	IX
<b>CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Background.....	1
1.2 Statement of the problem.....	5
1.3. Research Questions .....	6
1.4 Objectives of the study .....	6
1.5 Importance of the Study .....	7
<b>CHAPTER TWO: LITERATURE REVIEW .....</b>	<b>8</b>
2.1 Operations strategy in the industry .....	8
2.2 Critical decisions in operations management .....	9
2.3 Pharmaceutical industry through porter’s fives forces.....	16
2.4 Kenyan pharmaceutical industry.....	17
2.5 Conceptual framework .....	19
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>20</b>
3.1 Research Design.....	20
3.2 Population.....	20
3.3 Sampling and sample.....	20
3.4 Data Collection .....	21
3.5 Data Analysis .....	21
<b>CHAPTER FOUR: DATA ANALYSIS AND FINDINGS.....</b>	<b>23</b>
4.1 General information .....	23

4.2 Operations management practices.....	24
4.3 Additional information .....	32
4.4 Summary of findings .....	33
<b>CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>36</b>
5.1 Conclusion .....	36
5.2 Recommendations .....	36
5.3 Limitations of the study .....	37
5.4 Suggestions for further research .....	38
<b>APPENDICES .....</b>	<b>39</b>
Appendix I: Introduction Letter.....	39
Appendix II: Questionnaire .....	40
<b>REFERENCES .....</b>	<b>44</b>
Name of companies surveyed .....	47

## LIST OF TABLES

Table 1: Sample size .....	20
Table 2: Quality Management .....	24
Table 3: Choosing a location .....	25
Table 4: Human Resources and Job Design .....	26
Table 5: Supply chain management .....	27
Table 6: Layout Strategy.....	28
Table 7: Design of goods and services .....	28
Table 8: Process and capacity design .....	29
Table 9: Scheduling.....	30
Table 10: Maintenance .....	30
Table 11: Inventory Management .....	31
Table 12: Additional Information.....	32
Table 13: Summary of findings.....	34

## LIST OF FIGURES

Figure 1: Operations Management as a transformation process .....	2
Figure 2: Product Life Cycle.....	10
Figure 3: Conceptual Framework.....	19
Figure 4: Operations department.....	23
Figure 5: Operations plan.....	24



## ABSTRACT

Operations Management is the function of managing the operating core of an organization. These are activities associated with creation, production, distribution and the flow of the organization's goods and services.

This study was a survey on operations management practices applied by pharmaceutical companies in Kenya. The specific objectives of the study were to determine the operations management practices adopted by the companies and the extent of application of operations management practices. This is to provide a better understanding of the status of operations management practices in the pharmaceutical industry.

An appropriate survey was designed to enable the researcher achieve his objectives. The study used exploratory design. Stratified random sampling was used to group the companies according to their country of origin.

Data was collected using questionnaires that were divided into three parts to reflect the various operations management practices in a company. Data was then organized, tabulated and analyzed to answer the specific objectives of the study.

The study revealed that 36% of the companies had operations department. This indicates the significant role of operations management activities in their companies.

The study established that operations management practices were indeed being undertaken within the companies. It was found that companies undertook to a little extent most of the required practices. Though they did not have dedicated operations department, most of the critical decisions in operations were being made under other divisions.

## CHAPTER ONE: INTRODUCTION

### 1.1 BACKGROUND

Operations can be defined as the business function responsible for planning, coordinating and controlling resources needed to produce a company's products and services. It refers to running of the day-to-day operations of a given business. It can differ dramatically depending on the type of business being run and the operations undertaken. Operations management activities can be performed by in-house employees or can be outsourced, depending on the circumstances or the type of organization.

The operations function is the "doing part" of the organization (Barnes 2008). No organization can hope to be successful unless its operations are well managed. The importance of operations is emphasized by Hill (2005), who points out that it is the "function responsible for 60-70 percent of costs, assets and people.

Operations management (OM) is the set of activities that creates value in the form of goods and services by transforming inputs into outputs. Waters (2002) says that an operations manager makes decisions that keep the organization working effectively. Their decisions affect inputs, operations and outputs and they use feedback on performance and other relevant information to continually update their decisions.

#### 1.1.1 Operations Management as a Central Function

Traditional view says that every organization has three central functions: Operations, Finance and Marketing (Waters 2002). Marketing identifies customer demand, stimulates new demand, analyses customer needs, organizes product information and takes orders. Finance raises capital, invests funds, records financial transactions, arranges money transfers, collects costs information and maintains accounts of the company. It is the transformation process (see Figure 1) that a product goes between input and output. Transformation process is a series of activities along a value chain extending from supplier to customer. The transformation process can be physical, locational, exchange, physiological, psychological or informational. Product value is increased at each stage leading to a higher value at the output. Any activities that do not add value are superfluous and should be eliminated.

As seen in Figure 1 inputs such as materials, machines, labor, management and capital are transformed into outputs (goods and services). Requirements and feedback from customers are used to adjust factors in the transformation process, which may in turn alter inputs. Operations are more than planning and controlling: it's doing, whether its superior quality, speed-to-market, customization or low cost, excellence in operations is critical to a firm's success (Russell 2007).

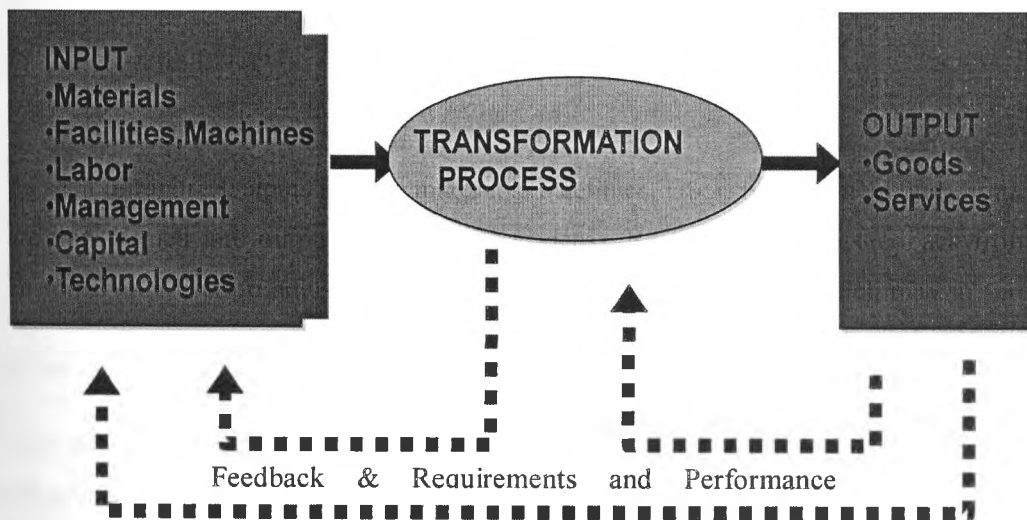


Figure 1: Operations Management as a transformation process

### 1.1.2 Development of Operations Management

Operations in some form have been around as long as human endeavor itself but, in manufacturing. It has changed dramatically over time, and there are three major phases - craft manufacturing, mass production and the modern period (Jacobs et al 2009).

Craft manufacturing describes the process by which skilled craftspeople produce goods in low volume, with a high degree of variety, to meet the requirements of their individual customers. Over the centuries, skills have been transmitted from masters to apprentices and journeymen, and controlled by guilds. Craftspeople usually worked at home or in small workshops. Such a system worked well for small-scale local production, with low levels of competition.

Mass production involves producing goods in high volume with low variety. Major contributors to this phase were Henry Ford and Fredrick Taylor. Henry Ford

developed the moving assembly line. In this system, instead of workers bringing all the parts and tools to a fixed location where one car was put together at a time, the assembly line brought the cars to the workers.

Frederick Taylor developed the system of 'scientific management'. He argued that the role of management was to analyze jobs in order to find the 'one best way' of performing any task or sequence of tasks, rather than allowing workers to determine how to perform their jobs. By breaking down activities into tasks that were sequential, logical and easy to understand, each worker would have narrowly defined and repetitious tasks to perform, at high speed and therefore with low costs.

Modern period saw new Japanese production techniques, such as Total Quality Management (TQM), Just-In-Time (JIT), Lean production, Kaizen and employee involvement being developed and emulated elsewhere in the world, with mixed results. Flexible specialization (Piore and Sabel, 1984) ensured that firms focus on separate parts of the value-adding process and collaborate within networks to produce whole products.

Lean production (Womack et al. 1990) was developed in the highly successful Toyota Production System. It focuses on the elimination of all forms of waste from a production system. Mass customization sought to combine high volume, with adapting products to meet the requirements of individual customers. Flexible manufacturing (Kidd, 1994) emphasized the need for an organization to be able to switch frequently from one market-driven objective to another.

### **1.1.3 Key Decisions in Operations Management**

At the operational level hundreds of decisions are made in order to achieve local outcomes that contribute to the achievement of the company's overall strategic goal (Russell 2007). Many decision-making situations occur under conditions of uncertainty hence decision-analysis. Decision-analysis is a set of quantitative decision-making techniques to aid the decision maker in dealing with a decision situation in which there is uncertainty. These critical decisions are design of goods and services, managing quality, process and capacity design, location strategy, layout strategy, human resources and job design, supply chain management, inventory management, scheduling and maintenance.

#### **1.1.4 Kenyan Pharmaceutical Industry**

The worldwide pharmaceutical industry develops, produces, and markets drugs licensed for use as medications in various countries. In Kenya, the pharmaceutical companies are allowed to deal in generic and/or brand medications and medical devices whether manufactured locally or imported. They are subject to a variety of laws and regulations regarding the patenting, testing and ensuring safety and efficacy and marketing of drugs. The Pharmacy and Poisons Board (PPB) is the Drug Regulatory Authority in Kenya established under the Pharmacy and Poisons Act, Chapter 244 of the Laws of Kenya. The Board regulates the practice of pharmacy and the manufacture and trade in drugs and poisons both for export and import.

According to a publication in the Business Daily 2010 25<sup>th</sup> September, Kenya's pharmaceutical industry is on a rebound. Sales of over-the-counter and prescription drugs clocked Ksh.17.7 billion in 2009 up from Ksh.14.4 billion from the previous year. By the year 2014, the Kenyan drug market is expected to hit a value of Ksh.33.5 billion. The publication stated that public procurement has been a key source of growth and the government has made some important reforms in the health sector. There has also been an expansion of the gross domestic product, which is usually positively associated with increased incomes. Increased public and private expenditure on healthcare, coupled with increasing levels of medical insurance coverage and continued foreign donor funding, are also creating significant opportunities for growth within the Kenyan pharmaceutical and medical devices industries.

Kenyan pharmaceutical industry is structurally not unique, as pharmaceutical companies differ according to their basic mission, performance and strategic development. The industry consists of three segments namely manufacturers, distributor and retailers. The manufacturers are the producers of the pharmaceutical products, while retailers break bulk and sell to the final consumer.

Other than local manufacturers, most companies operating in Kenya originate from USA, Europe, Middle East, India and other Asian countries. The bulk of Kenyan manufactured preparations are non-sterile (medical consumables) and over the-counter (OTC) products. Kenya is the largest producer of pharmaceutical products in the Common Market for Eastern and Southern Africa (COMESA) region, supplying about 50% of the regions' market. COMESA region has an estimated 50 locally based pharmaceutical

manufacturers; approximately 30 are based in Kenya. (Export Processing Zone Authority 2005). This makes Kenya, not only the market-leader, but also a very competitive market.

### **1.1.5 Operations management practices in Kenya**

Sharif (2010) in his research project found that Safaricom's M-pesa service employed operations strategies to succeed in the mobile money transfer business. He concluded that the company has aptly employed innovation strategy as an operations strategy in order to keep M-pesa ahead of competition as well as to make the service more attractive to various types of clientele. According to Chelang'at (2010) most commercial banks in Kenya implemented the lean six sigma operations to increase efficiency, enhance operational excellence and to reduce costs. She found that most commercial banks had the following critical success factors in implementing the lean six sigma management: effective communication, understanding tools and techniques within the six sigma management, use of technology, top down management and commitment, linking to customers, leadership and environment that encourage constant improvement of product and services.

Balanced scorecard is a management approach that enables an organization to clarify their vision and strategy and translate them into actions (Elesani 2010). Elesani (2010) further concluded that balanced scorecard is an objective oriented approach in achieving the goal of an organization. This approach was found to have the support of the management at CFC Life Assurance, as it removes biases, is more objective, and results oriented making employees to be more focused on Key performance indicators. This study therefore sought to find out operations management practices adopted by pharmaceutical companies in Kenya. Commercial banks are major players in the Kenyan economy and therefore having adopted the lean six sigma management, it shows the significance of operations management in a company.

### **1.2 STATEMENT OF THE PROBLEM**

Over time, even pharmaceutical companies globally have come to appreciate the significance of operations management. GlaxoSmithKline aims to simplify their operating model to ensure that it is fit for purpose and able to support business in the most efficient way ([www.gsk.com/mission-strategy/simplify.htm](http://www.gsk.com/mission-strategy/simplify.htm)). The company goes ahead to say that as its business continues to change shape: it is essential that

they transform the operating model to reduce complexities, improve efficiencies and reduce cost. Through their global restructuring program, they have removed £1.7 billion of cost since 2008 and are on track to deliver a target of £2.2 billion of annual savings by 2012 (GSK.com).

In Kenya, a number of studies have been done to ascertain various operations management practices in the pharmaceutical industry, Tanui (2008) surveyed quality management practices of pharmaceutical manufacturing companies in Kenya; Mogoi (2010) studied the operational management practices on the procurement of pharmaceutical products in developing countries with a focus on Kenya Medical Supplies Agency (KEMSA), Mbirwe (2007) studied positioning strategies used by pharmacies in Nairobi. Various other researchers have studied and documented some aspects of operations management practices in various industries in Kenya. For example a study has been done on benchmarking as a continuous improvement tool, focusing on the parastatals within the Ministry of Agriculture in Kenya by Ongose (2009), Njiru (2010) studied use of balanced scorecard in strategy implementation by companies quoted in the Nairobi stock exchange and extent of adoption of lean thinking in Kenyan petroleum industry was done by Wamuyu (2009).

There is no known study on the operations management practices adopted by pharmaceutical companies operating in Kenya. This study, therefore sought to fill the gap on whether pharmaceutical companies in Kenya employ operations management practices.

### **1.3. RESEARCH QUESTIONS**

The research questions for this study are as listed below.

1. Do pharmaceutical companies in Kenya apply operations management practices?
2. Which operations management practices are adopted by pharmaceutical companies in Kenya?

### **1.4 OBJECTIVES OF THE STUDY**

The following are objectives of this study.

1. Determine the extent of application of operations management practices by pharmaceutical companies in Kenya.

2. To determine the operations management practices adopted by pharmaceutical companies in Kenya.

### **1.5 IMPORTANCE OF THE STUDY**

This study was of great significance to different segments of the society. To begin with, it was a basic research designed to contribute to better understanding of the pharmaceutical industry and also to provide an understanding of the operational constraints and remedial measures to pharmaceutical companies.

The academia and research institutions in the area of operations management will gain an insight from this study on the various operations management practices applied by pharmaceutical companies in Kenya as well as challenges encountered in the process of their decision- making and implementation. This will enable the academia to undertake further research on various other aspects of operations management practices.

The results of this study will also inform policymakers and the government on improvements that may be required in the business environment to enable smooth operations of businesses. It will also provide the regulatory authorities with systems to ensure supply of quality, safe and efficacious medicines to the public.



## **CHAPTER TWO: LITERATURE REVIEW**

Operations are the activities that are primarily concerned with making organizations produce products efficiently and effectively (Waters 2002). These activities include design of goods and services, managing quality, process and capacity design, location strategy, layout strategy, human resources and job design, supply chain management, inventory management, scheduling, maintenance. This review also involves operations strategy which consists of all strategic decisions relating to operations and how companies have used it to their advantage.

### **2.1 OPERATIONS STRATEGY IN THE INDUSTRY**

By linking operations and operating strategies with the overall strategy of the organization synergy can result. The criteria for judging operations is changing from cost control, which is a narrowly defined operating objective, to more global performance measures such as product performance and variety, product quality, delivery time, and customer service. When flexibility is designed into operations, an organization is able to rapidly and inexpensively respond to changing customer needs (Waters 2002).

The way in which an organization secures, deploys, and utilizes its resources will determine the extent to which it can successfully pursue specific performance objectives (Barnes 2008). Slack et al (2004) argue there are five operations performance objectives which are cost, quality, speed, reliability and flexibility.

Cost involves adopting a positive strategy of minimizing costs and supplying products at the lowest possible prices. Types of operations in such a case involve large-scale production, automation, high productivity, and low overheads. Quality refers to the ability to produce in accordance with specification and without error. Customers are continually demanding higher quality, so many organizations design strategies to deliver guaranteed high-quality products. Speed is the ability to do things quickly in response to customer demands and thereby offer short lead times between when a customer orders a product or service to when they receive it. In reliability, companies deliver products and services in accordance with promises made to customers without fail. The ability to change operations and meet specific customer requirements brings in flexibility. Flexibility comprise four aspects of ability to change the volume of production, ability to change the time taken to produce, ability to change the mix of

different products or services produced, the ability to innovate and introduce new products and services.

Barnes (2008) says that excelling at one or more of these operations performance objectives can enable an organization to pursue a business strategy based on a corresponding competitive factor. Similarly, to be a world class company, one must no longer view cost, quality, speed of delivery and even flexibility as tradeoffs but as essentials to any business function.

## **2.2 CRITICAL DECISIONS IN OPERATIONS MANAGEMENT**

At the operational level hundreds of decisions are made in order to achieve local outcomes that contribute to the achievement of the company's overall strategic goal (Russell 2007). Many decision-making situations occur under conditions of uncertainty hence decision-analysis. The ten critical decisions in operations management are discussed below.

### **2.2.1 Goods and services design**

According to Henzer (2004), design of goods and services defines much of the transformation processes. The factors of cost, quality and human resources must be made during this stage. Operations management of goods and services is also different due to their different characteristics. Waters (2002) says that in reality every product is a package that contains goods and services, a washing machine manufacturer also gives an after –sales service, and a health service provider also supplies medicine. Organizations have to design every aspect of this package to give a product that customers want.

This process starts with product planning which is concerned with all the decisions about design and introduction of new products, changes to existing products and withdrawal of old products. Because customer demand changes over time, marketing and operations management need to work closely, to assess customer demands and suggest products that satisfy them (Waters 2002). Demand for a product changes over time. It usually follows standard life cycle which has five phases, which are: introduction, growth, decline and withdrawal phases (see figure 2). Introduction phase: the product is new, and demand is low while people learn about it and see if they like it.

Growth phase sees new customers buy the product, it becomes more popular and demand rises quickly. Maturity phase sees demand stabilize as potential customers know about the product, and they buy it in steady numbers (Waters 2002). During the decline phase, the product is now getting old, and sales fall as customers start buying new alternatives. This is finally followed by withdrawal where demand declines to the point where it is no longer worth making the product.

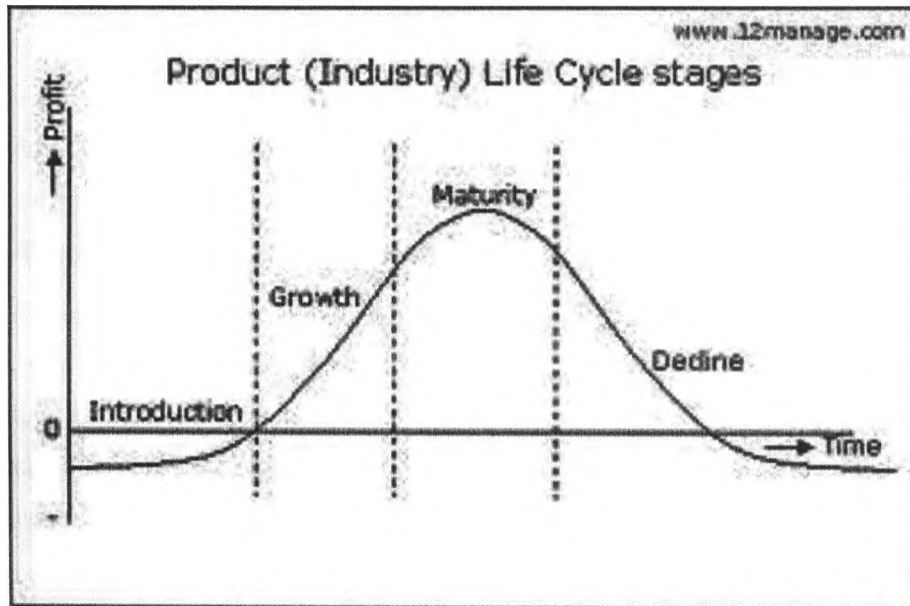


Figure 2: Product Life Cycle

According to Waters (2002) Product Life Cycle has four important consequences for the operations. First organizations focus on different aspects of operations at each stage of the cycle. Costs, revenue and profit vary considerably, organizations with different expertise start and later stop making products at different points in the cycle and organizations make a range of products to smooth overall production.

### 2.2.2 Quality Management

John Wiley et al (2009) says that customers' and producers' view depend on each other. Producer focuses on production process and cost, while customer focuses on fitness for use and price. However, customer's views dominate. Customer has a very high quality standard nowadays and operations management decision in quality must be clear and strict for its members to understand and comply. It must set a quality, standard and operating procedure to meet customer's high expectation. In recent years there has been a "quality revolution" due to a number of reasons. These include

improved processes that can make products with guaranteed high quality, which gives producers a competitive advantage, consumers demand high-quality products, and will not accept anything less and high quality reduces cost (Waters 2002).

The dimensions of quality primarily for manufactured products that a consumer looks for in a product include performance, features, reliability, conformance, durability, serviceability, aesthetics and safety. In service, quality involves the following dimensions; time and timeliness, completeness, courtesy, consistency, accessibility and convenience, accuracy and responsiveness. UNIDO (2010) says there is a variation in Good Manufacturing Practice (GMP) among local firms. Some firms have made investments to meet these standards while others are deterred from making upgrades through lack of finance or technical assistance.

### **2.2.3 Process and Capacity Design**

Manufacturing of physical products may have higher importance on process and capacity design than services operation. Operations management for a product should decide what processes to use, what type of technology and to what extent to apply it, type of human resources required, quality and maintenance services that will determine its basic cost structure. Services operation decision on this area is much simpler and it can be determined by customers who are directly involved in the process. For example, customer will ask tailor to design specific fashion clothes.

Capacity design issue is critical for services because it will try to reduce waiting time and avoid loss of sales due to insufficient capacity. For manufacturing capacity design is based on firm's financial capability, forecast for future and market demand (Henzer 2004). According to UNIDO (2010) Kenyan domestic companies have low capacity utilization. It says most companies are running their production lines at capacity of between 50-66 percent. Production costs per unit are therefore relatively higher and this impacts negatively on their ability to be cost competitive.

### **2.2.4 Location Strategy**

Location can be an area for operations management to decide and with globalization of business, operations managers too must think global. For physical goods, location selection can be determined by pools of qualified human resources, technology, raw

material, access to market and government policy. For services as it is direct to customers, the location is determined by market accessibility or near to customer as possible. Retail and service facilities are usually small and least costly. One of the most important factors in locating retail or service facility is proximity to customers. In Kenya, banks have been streaming back to regions previously considered unprofitable so as to get closer to their customers. Construction costs tend to be less important, although rent or leasing costs can be high (Russell et al 2007).

In recent years U.S companies have begun to relocate in foreign countries to be closer to newly emerging markets and to take advantage of lower labor costs (Russell 2007). Locally, companies consider the infrastructure and location incentives like government regulations. Three techniques are often used to make location decisions. These are location factor rating, centre-of-gravity technique and load-distance technique (Russell 2007).

#### **2.2.5 Layout Design`**

Facility layout refers to the arrangement of machines, departments, workstations, storage areas, aisles, and common areas within the existing or proposed facility (Russell 2007). Layout decisions are important because they require substantial investments of both money and effort, involve long term commitments and have significant impact on the cost and efficiency of short term operations. Effective layouts minimize material handling costs, utilize space efficiently, utilize labor efficiently, eliminate bottlenecks, facilitate interaction and communication within the facility, reduce customer service time, eliminate redundant movement, facilitate entry and exit of people, materials and products. It also incorporates safety and security measures, promote product and service quality, encourage proper maintenance activities, provide visual control of activities and increase capacity.

There are three basic types of production layouts namely process, product and fixed-position layouts. Process layouts group similar activities together in departments or work centers according to the process or functions they perform. A good example is a supermarket where electronics, clothes, utensils, stationery, cosmetics are all placed at different places. Product layouts arrange activities according to the sequence of operations that need to be performed to assemble a product. This type of layout is

common in vehicle assembly and leads to efficiency and ease of use. Fixed-position layouts are typical of projects in which product produced is too fragile, bulky, or heavy to move like ships.

### **2.2.6 Human Resources and Job Design.**

Employees are the integral part in the total system design. Operations management must set a policy to set labor standards to ease transition of skills, improvement of knowledge, skills and abilities, build a balance work and life quality in an effective cost target. According to UNIDO (2010) the number of trained pharmacists, in Kenya is increasing with time but is still insufficient relative to the population in need (one pharmacist for every 8,710 persons, or approximately 0.1 per 1,000 persons). It concludes that pharmacists trained locally in Kenya lack a basic industrial orientation and this may hinder the growth of the sector.

For services, one extra area operations management should touch is customers' relationship since they deal with them directly (Henzer 2004). In Taylor's system of scientific management, job is a set of all tasks performed by a worker: tasks are individual activities consisting of elements, which encompass several job motions (Russell 2007). "Quality of life" program was popularized by General motors and tried by several other companies. These programs promoted good job design (Russell 2007). They included horizontal job enlargement which give an employee a variety of tasks making the job more interesting and making the employee feel that he has actually achieved something. Job enrichment involves giving an employee control over their work and some supervisory responsibilities. Workers are also held individually responsible for quality and reliability, a function previously held by management. Job rotation enhances the skill level of workers providing them with a greater sense of self-worth. Finally the company should promote interaction and communication among workers and between workers and management. Job design involves task analysis, worker analysis and environmental analysis to improve worker productivity.

### **2.2.7 Supply Chain Management**

Supply chain encompasses all activities associated with flow and transformation of goods and services from raw materials stage through to the end user, as well as the

associated information flows. Decisions that have to take place of what to produce, what material to buy, from where, how is the cost and how is the delivery from supplier to the final end customers, is on-time delivery and minimum cost possible. It is more critical in production and supply of goods than it is to services (Henzer 2004). One of the company's main objectives is to align upstream flow of materials with downstream distribution so that it can respond to uncertainty in customer demand without creating costly excess inventory.

Information is the essential link between all supply chain processes and activities including suppliers, manufacturers, distributors, retailers and customers. Computer and real time technology allow online communication throughout the supply chain. Some of the popular current applications of information technologies for supply chain management include electronic business, electronic data interchange (EDI), bar coding, internet and the World Wide Web.

### **2.2.8 Inventory**

The objective of inventory management is to provide uninterrupted production, sales, or customer-service levels at the minimum cost. For many companies inventory is the largest item in the current assets category, inventory problems can and do contribute to losses or even business failures. It is important to make the correct decisions on how and where the inventory level should be kept to keep long term customers satisfied, suppliers, material availability so as not to not only disrupt production but also contain costs. Inventory costs include carrying costs which is cost of holding an item in inventory, ordering costs which are the costs associated with replenishing the stock of inventory being held while shortage costs occur when customer demand cannot be met due to insufficient inventory. Inventory control systems are used to determine how much to order and when to order at optimal costs.

Goods production are of more concern to manufacturers because they may have to keep raw materials, in progress work, order and final goods while services is not critical as it is directly produced and consumed simultaneously (Henzer 2004). A company might keep large parts and materials inventory to meet variations in supplier deliveries. Companies also purchase large volumes to take advantage of quantity discounts.

These are continuous inventory systems which ensure a continual record of the inventory level is maintained. In periodic inventory systems, the inventory at hand is counted at specific time intervals like weekly or monthly.

### **2.2.9 Scheduling**

Scheduling specifies when labor, equipment and facilities are needed to produce a product or provide a service (Russell 2007). The objectives of scheduling include meeting customer due dates, minimizing job lateness, minimizing response time, minimizing completion time, reducing over time, maximizing labor utilization, reducing idle time and minimizing work-in-process inventory. Regardless of their primary scheduling objective, manufacturers typically have a production control department whose responsibilities consist of checking the availability of material, machine and labor, releasing work orders to the shop and issuing dispatch lists of individual machines and monitoring which is maintaining progress reports on each job until it is completed.

Schedules are more formal in goods production and supply with short, medium and long term planning to accommodate customers demand. For services the demand is more direct and volatile and often concern on human resources and availability to meet current customers needs (Henzer 2004). Labor is one of the most flexible resources. Workers can be hired and fired more easily than equipment can be purchased and sold. This flexibility is valuable but makes scheduling difficult. Service firms especially spend an inordinate amount of time developing employee schedules (Russell 2007). One way to avoid headaches of employee scheduling and improve customer response is to automate, just like the banking industry does with automatic teller machines. Realistic schedules, therefore, must reflect capacity limitations.

### **2.2.10 Maintenance**

Dependability of service is one of the performance measures by which a company can distinguish itself (Dilworth 1992). To establish a competitive edge and to provide good customer service, companies must have reliable equipment that will respond to customer demand when needed. More highly trained maintenance workers are



required, and the cost of parts replacement is higher. Preventive maintenance consists of maintenance activities performed before an equipment breakdown, with the intent of keeping it operating. Remedial maintenance consists of efforts to restore facilities and equipment to acceptable operating condition after breakdown. In evaluating maintenance policies a company may consider several options and trade-offs, among them: centralized versus decentralized, use of contract versus in-house maintenance, the number of standby machines to hold, repair versus replacement of defective equipment, individual versus group replacement, the amount of replacement capacity that should be kept available and the extent to which preventive and remedial maintenance should be used (Dilworth 1992).

### **2.3 PHARMACEUTICAL INDUSTRY THROUGH PORTER'S FIVES FORCES**

Michael Porter (1979) considered to be one of the foremost gurus' of management, developed the famous five-force model, which influences an industry. The model consisted of industry competition, bargaining power of suppliers and buyers, entry barriers and threat of substitutes. Concentration ratio for this industry is very low. High growth prospects make it attractive for new players to enter in the industry. Similarly, barriers to entry are very low. The fixed cost requirement is low but the need for working capital is high (Equitymaster.com).

An important fact is that pharmaceutical industry is a stable market and its growth rate generally tracks the economic growth of the country with some multiple (1.2 times average in India). Though volume growth has been consistent over a period of time, value growth never follow in tandem. Consequently, product differentiation is not the driver, cost competitiveness is. However, companies like Pfizer and GlaxoSmithKline have created big brands over the years, which act as product differentiation tools. (Equitymaster.com).

Bargaining power of buyers is limited in this industry. The unique feature of pharmaceutical industry is that the end user of the product is different from the influencer (read doctor or physician). The consumer has no choice but to buy what doctor says. Buyers are scattered and they as such do not wield much power in the pricing of the products.

The suppliers have very low bargaining power and the companies in the industry can switch from their suppliers without incurring a very high cost. However, a supplier can go for forward integration to become a distributor. Pharmaceutical industry is one of the most easily accessible industries for an entrepreneur. The capital requirement for the industry is low: creating a regional distribution network is easy, since all a company has to do is link with already existing wholesalers and distributors. This reduces barriers to entry.

This is one of the great advantages of the pharmaceutical industry. Whatever happens, demand for products continues and the industry thrives. One of the key reasons for high competitiveness in the industry is that as an on going concern, the industry seems to have an infinite future.

## **2.4 KENYAN PHARMACEUTICAL INDUSTRY**

Ojung'a (2010) in his study concluded that the Kenyan pharmaceutical marketplace has expanded and attracted many more entrants. This has caused increased competition and changed the industry structure somehow. The pharmaceutical firms are therefore forced to pursue strategies that will guarantee them a desirable level of growth in market share of their brands. According to Drug Index (2011), Kenya had a total of 320 pharmaceutical manufacturers operating in the country.

### **2.4.1 Regulations in the Pharmaceutical Industry**

The Pharmacy and Poisons Board (PPB) is the Drug Regulatory Authority in Kenya established under the Pharmacy and Poisons Act, Chapter 244 of the Laws of Kenya. The Board regulates the Practice of Pharmacy and the Manufacture and Trade in drugs and poisons both for export and import. Registration of pharmaceutical products is usually granted on the basis of efficacy, quality and safety. It is a regulatory decision that allows medicine to be marketed in the country (Ruoselle, 1996). Compliance with regulations affecting drug licensing, accreditations and approvals can be costly for pharmaceutical companies wanting to market their products (Mogoi 2010).

Kenya's Health Policy Framework (MOH, 1994) outlines the goal of the health sector policy to promote and improve the health of all Kenyans through the deliberate restructuring of the health sector to make all health services more effective, accessible and affordable. This framework outlines comprehensive health sector reforms,

amongst them strengthening the policy role of the central Ministry of Health; decentralization and capacity strengthening of provincial and district levels; re-orientation, re-training and re-deployment of health manpower, and adoption and implementation of the National Drug Policy as the guiding document for legislative reforms, staff development and management improvements in pharmaceutical services (MOH 2007).

#### **2.4.2 Promotion and Marketing**

Promotion and marketing of pharmaceuticals follows the code for pharmaceutical promotion in Kenya. The code sets out standards for the ethical promotion and conduct of Pharmaceutical representatives in their interactions with healthcare professionals to ensure that they are appropriate and perceived as such (Code for Pharmaceutical Promotion in Kenya 1999). Promotion should encourage the appropriate use of pharmaceutical products by presenting them objectively and without exaggerating their properties.

#### **2.4.3 Growth strategies adopted by Kenyan Firms**

Kenyan pharmaceutical marketplace has expanded and attracted many more entrants. This has caused increased competition and changed the industry structure somehow. The pharmaceutical firms must therefore pursue strategies that will guarantee them a desirable level of growth in market share of their brands. In his study that sought to find out the strategies employed by pharmaceutical companies to increase their market share Ojung'a (2007) found that selling existing products to existing customers was the market share growth strategy that was pursued most by majority of the firms. This was followed by selling of new products and services and selling existing products to new customers. Finding new competitive arenas, selling to new geographies, selling more through new delivery approaches and establishing new industry structures were moderately pursued growth strategies, and the extent of their use varied more from one company to another. No single strategy appeared sufficient to deliver the ideal market share growth that the surveyed pharmaceutical companies desire.

The choice of strategy that a company pursued and the extent of its use appeared to be influenced by factors that determined the competitive position that the firm occupied, such as the nature of business and products as well as ownership of the firm. They also rely on superior product quality, better customer relationship and improved

service quality rather than price reduction to gain competitive advantage. Building good relationships with clients and suppliers is a key factor in the business because of the nature of the pharmaceutical industry which is characterized by high volume, low margin while being primarily credit based in a country where many people stretch credit periods for as long as they can ( Business Daily, December 14 2010).

### 2.5 CONCEPTUAL FRAMEWORK

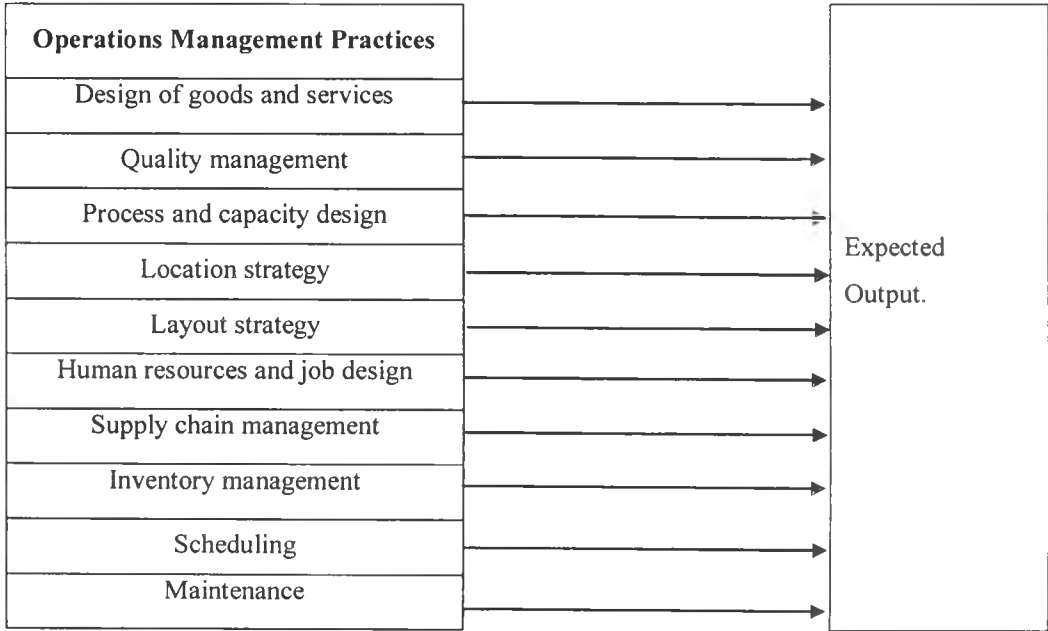


Figure 3: Conceptual Framework

Most companies exist to improve profitability and growth. With proper adoption of operations management practices, companies tend to improve on efficiency and effectiveness that lead to growth and increase in profitability.

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.1 RESEARCH DESIGN

This was an exploratory study designed to identify the extent to which pharmaceutical companies in Kenya apply operations management practices. Research design was through survey. Surveys are concerned with describing, recording, analyzing and interpreting conditions that exist.

### 3.2 POPULATION

In this study the target population was the pharmaceutical companies in Kenya, registered by the Pharmacy and Poisons Board as at 31<sup>st</sup> August 2011 with their headquarters in Nairobi. The research was undertaken in Nairobi since this is where most companies have their headquarters and therefore research data could be easily obtained and gave a true picture of the company operations.

### 3.3 SAMPLING AND SAMPLE

Stratified random sampling was used. In this case the population was first divided into strata based on its country of origin. According to Mugenda and Mugenda (2003) for a sample to be representative enough, it should be at least 10% of the target population. However, for this study a sample of 20% was used to improve accuracy because of the different strata used. Using this technique a sample size of 64 was obtained which was then distributed proportionately among the various strata. The table below summarizes the strata, population and sample.

Region	Total Population	Sample Population
US and Europe	183	36
Middle East	9	2
Africa	30	6
Asia	98	20
<b>Total</b>	<b>320</b>	<b>64</b>

Table 1: Sample size

If we use the formula:

$$\text{Sample size, } n = \frac{Z^2 ZS^2}{E^2} \text{ we would get a sample size of 58. Thus a}$$

sample size of 64, as shown in the table was justified.

### **3.4 DATA COLLECTION**

Primary data was used in this study because it was quick to get, inexpensive, efficient, accurate and flexible (Mugenda and Mugenda, 2003). It was collected through a questionnaire targeting heads of department or country managers as they were well placed to understand the operations of the company. There was a single respondent in each company.

The questionnaire was divided into three sections providing general information, operations management practices and additional information respectively. The general information section provided bio-data of the companies. The second part of the questionnaire provided information on the operations management practices applied by the pharmaceutical companies. The third part provided data that was used to verify and supplement information given in section two.

Questionnaires had open-ended and closed-ended questions. The closed-ended questions were in a likert scale format of five points. They were dropped at the respondents' offices and collected after a day or two so as to allow respondents ample time to respond to the questionnaire.

### **3.5 DATA ANALYSIS**

Once collected, data was organized, tabulated and summarized. Summary measures of mean and standard deviation calculated for all questions in the likert scale. Tables and graphs were used to illustrate the findings. For each operations management practice an average was calculated and it was used to indicate the extent of application of the operations management practice. This was referred to as the group average. The global average was determined to indicate the overall extent of application of operations management practices within the pharmaceutical industry. This gave answer to the first objective.

Data obtained from the likert scale was used to determine the extent of application of operations management practices by the companies. The average score of all the questions were used to determine the group average. From the scale of 1-5, where 1 meant strongly disagree and 5 meant strongly agree, an average score of 3.0 and above was taken to imply the existence of the practice. Content analysis was undertaken to analyze the third section of the questionnaire.

The presence of certain words and texts was determined and grouped into broad categories. The most preferred activity was then determined from the categories. This was then used to summarize information from the respondents. The Statistical Package for Social Sciences (SPSS) and Microsoft Excel were used in the data analysis.

## CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

The main objective of this study was to determine the operations management practices applied by pharmaceutical companies in Kenya. Of the 64 questionnaires that were distributed, 55 were filled and returned representing 86% response rate. This rate was considered acceptable given that it was above 50%. The data was captured and analyzed using Microsoft Excel and SPSS. The findings were presented in charts, graphs and tables.

### 4.1 GENERAL INFORMATION

The study required the respondent to give their position and department to enable the researcher determine if the respondent is qualified to provide the necessary information. This section was also used to determine whether the firms have operations departments and operations plan.

#### 4.1.1 Operations Department

The researcher sought to establish whether the organizations had operations department. The research findings indicated that 36% of the firms had operations department while 64% did not have. The results are shown in Figure 4.

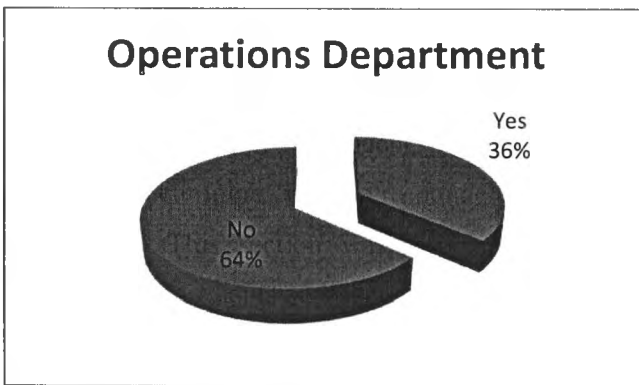


Figure 4: Operations department

From the above findings it is evident that 64% did not acknowledge the significance of having a dedicated department to handle all the operations management practices.



### 4.1.2 Operations Plan

The study sought to establish whether companies had operations plan. The results of the study, as shown in Figure 5, show that 82% of the companies had an operations plan while 18% did not have any.

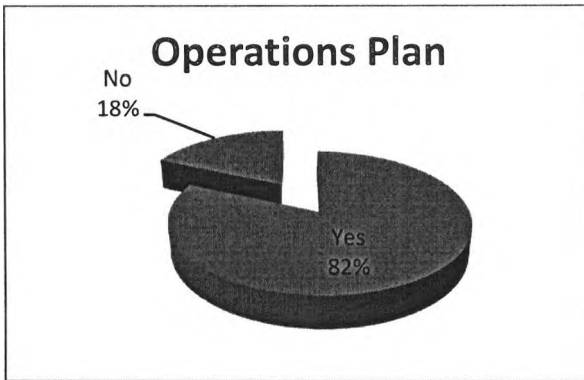


Figure 5: Operations plan

## 4.2 OPERATIONS MANAGEMENT PRACTICES

This section involved analyzing data on a likert scale to study the extent of application of operations management practices. The data was based on a likert scale of 1-5 where 1= strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree on the existence of an aspect of operations management practice. The results were presented in tables showing the mean and standard deviation of the degree of the existence of each aspect.

### 4.2.1 Quality Management

The study sought answers to various aspects of quality management ranging from the products, customers and the staff members. The results are shown in Table 2.

Table 2: Quality Management

Quality Management	Mean	S. D
Company has a quality management system in place.	2.42	4.71
Company carries out studies to evaluate customer satisfaction.	2.89	2.00
Company welcomes and acts on customers' complaints.	3.13	3.94
Company determines quality products through acceptance	2.97	2.88
Company relies on feedback from Pharmacy and Poisons board on quality of its products.	3.11	3.81
There is continuous improvement in handling customers.	3.81	5.46
Staff are continuously trained and educated on quality programs.	3.68	5.26
<b>Group Average</b>	<b>3.14</b>	<b>4.01</b>

The group average was 3.14 indicating an acceptance by the respondents that quality management is being practiced. From the findings it was evident that there is continuous improvement in handling of customers (mean=3.81). This could be proved by the fact that staff members are continuously trained and educated on quality programs (mean=3.68).

There was a plan to improve the customers' experience with the firms by welcoming and acting on complains within the companies (mean=3.13). There was cooperation with the regulatory authority, pharmacy and Poisons Board; hence their feedback was accepted within the firms (mean 3.11).

The firms had no quality management systems in place (mean=2.42). They also did not carry out studies to evaluate customer satisfaction but instead relied on their complaints to improve on quality.

Most pharmaceutical companies in Kenya import their products into the country and this study sought to know how they determine the quality of their imports. The findings showed that acceptance sampling was used (mean= 2.97 ~ 3.0).

#### 4.2.2 Considerations in choosing current location

Table 3 shows that in choosing the current location, distribution, transportation and other utilities were considered (mean score = 4.15), companies also considered a location that is close to customers (mean score = 3.16) and affordable rent and leasing cost (mean score = 3.02).

Table 3: Choosing a location

Choosing a Location	Mean	S.D
Location is close to customers.	3.16	2.74
Distribution, Transportation and other utilities are easily accessible.	4.15	12.73
Affordable rent and Leasing costs.	3.02	5.05
Labor easily available	3.85	12.39
<b>Group Average</b>	<b>3.54</b>	<b>8.23</b>

### 4.2.3 Human Resources and Job Design

The findings for the extent of application of the above practice are as shown in Table 4. The research established that firms practiced human resources and job design.

Table 4: Human Resources and Job Design

<b>Human Resources and Job Design</b>	<b>Mean</b>	<b>S.D</b>
There is a system for collecting employees' opinions.	2.93	5.36
There is a strong spirit of cooperation in the organization.	3.55	5.79
Employees fully understand the goals, policies, and objectives of this organization.	3.47	4.53
Supervisors provide feedback to employees on how well they are doing.	3.82	8.80
Management gives priority to employees' personal welfare.	3.20	5.61
Employees have access to all the training they need.	3.38	3.39
Employees understand their duties and are never idle.	3.00	6.34
<b>Group Average</b>	<b>3.33</b>	<b>5.69</b>

From the study there was a weak system for collecting employees' opinions (mean = 2.93). However, there existed a strong spirit of cooperation within the firms. Employees understood the goals, policies and objectives of the company (mean = 3.47). The cooperation spirit was seen in supervisors providing feedback to employees on their performance and management giving priority to staff welfare (mean = 3.20). The results show that training of employees was undertaken allowing them to understand their duties and never to remain idle. In this regard therefore, the firms took issues of job design seriously so as to get maximum benefits from their human resources.

#### 4.2.4 Supply Chain Management

The study also sought to establish the extent of application of supply chain management. The findings for this practice were as tabulated in Table 5. With a group average of 3.00, supply chain management was being undertaken by the pharmaceutical firms through to a small extent.

Table 5: Supply chain management

<b>Supply Chain Management</b>	<b>Mean</b>	<b>S.D</b>
Suppliers operate as single entities with one goal.	2.74	6.42
The company deals with a few prequalified suppliers.	3.37	4.87
Company gathers feedback from distributors and customers on how to improve the systems.	2.95	3.61
The company provides technical assistance to suppliers, distributors and customers.	2.96	2.68
The company can locate and track movement of items sent to its customers.	2.96	3.81
<b>Group Average</b>	<b>3.00</b>	<b>4.28</b>

However, from this study suppliers operated as separate entities with their own goals (mean = 2.74), the companies had weak systems of gathering feedback from distributors and customers on how to improve their systems (mean = 2.95).

Evidence of lack of close coordination and communication within the supply chain could be seen by very little extent of technical assistance to distributors, suppliers and customers (mean = 2.96). The firms can only track the movement of its products through the supply chain to a small extent.

#### 4.2.5 Office planning and layout

The findings are as shown in Table 6. From the study it was evident that departments are divided based on similarity of duties (mean= 3.53). Since pharmaceutical companies deal with different products, it was found that divisions are grouped depending on the products they deal with (Mean = 3.97).

The companies attended to employees safety (mean= 3.88). This was coupled with ease of communication and movement of goods from one section to the other (mean= 3.05).

Table 6: Layout Strategy

Layout Strategy	Mean	S.D
Departments are divided based on similarity of duties.	3.53	3.56
Divisions are grouped depending on products they deal with.	3.97	5.50
Divisions operate according to their geographical locations	2.61	2.19
Designed for ease of future expansion and improvement.	2.78	6.46
To make it easy to move goods from one section to another	3.05	7.71
Properly utilize the space available	2.91	5.79
It is easy for employees to communicate with one another	3.25	4.24
To ensure safety of employees	3.88	6.27
<b>Group Average</b>	<b>3.25</b>	<b>5.22</b>

The study also showed that divisions carried out operations, slightly, according to their geographical regions (mean = 2.61).

#### 4.2.6 Design of goods and services

As shown in Table 7, the study found that companies practiced design of goods and services in operations management practice (mean = 4.02).

Table 7: Design of goods and services

Design of goods and services	Mean	S.D
To comply with the legal requirements in the country.	3.44	3.96
Make the products easily acceptable in the market.	4.55	8.85
Make the products appealing to customers.	4.33	8.14
Make products that are able to satisfy customers'	4.49	9.17
To achieve competitive advantage	4.24	6.91
Company follows keenly on what competitor has in the market	3.77	4.74
To minimize the cost of the product.	3.35	2.86
<b>Group Average</b>	<b>4.02</b>	<b>6.38</b>

Customers were the biggest winners anytime pharmaceutical companies are designing new products. The development of new products is customer focused. Products were

made to be easily acceptable in the market (mean = 4.55), able to satisfy customers (mean = 4.49) and achieve competitive advantage.

Pharmaceutical industry is subject to a number of rules and regulations that firms are required to adhere to. The companies surveyed confirmed this by considering the legal requirements in the design of their products (mean = 3.44).

In designing products, the firms keenly followed what the competitor had in the market (mean = 3.77). Finally, designs had to minimize costs.

#### 4.2.7 Process and capacity Design

The study shows that companies are able to forecast demand accurately (mean = 3.49). However, that was all that respondents agreed was being done in process and capacity design.

Table 8: Process and capacity design

Process and Capacity Design	Mean	S.D
Company does invest in systems that require along time for benefits to be seen.	2.38	5.13
Company is able to respond to changes in demand quickly.	2.41	4.88
Subcontracts work to other firms when demand is high.	2.03	5.40
Company is able to forecast demand accurately.	3.49	5.83
<b>Group Average</b>	<b>2.58</b>	<b>5.31</b>

Companies did not invest in systems that required a long time for benefits to be seen (mean = 2.38). Lack of such investments over time made the companies unable to respond to changes in demand quickly (mean= 2.41). And finally, the firms never sub contracted work to other firms when demand is high.

#### 4.2.8 Scheduling

Scheduling is done to use resources efficiently to give low costs and high utilizations. The study, as shown in Table 9, found that scheduling is somewhat practiced among pharmaceutical companies in Kenya (Group Average = 2.72). The results are shown in Table 9.

Table 9: Scheduling

<b>Scheduling</b>	<b>Mean</b>	<b>S.D</b>
Company maintains constant production and supply.	3.31	2.70
Company hires more workers when demand increases.	2.43	3.39
Increasing or decreasing working hours depending on demand.	2.32	4.09
Employees work overtime more often to clear backlogs.	2.82	4.90
<b>Group Average</b>	<b>2.72</b>	<b>3.77</b>

The firms maintain constant production and supply as seen in Table 9. This is evidenced by company not hiring more workers when demand increases, increasing or decreasing working hours depending on demand and somewhat employees working overtime to meet demand. They all had a mean of below 3.00, indicating slight extent of application or no application at all.

#### 4.2.9. Maintenance

The group average was 3.24 indicating the firms carry out maintenance practices. Results are shown in Table 10. Maintenance services are done regularly (Mean = 3.69) and the organizations undertake regular inspection of its products and facilities (mean = 3.74).

Table 10: Maintenance

<b>Maintenance</b>	<b>Mean</b>	<b>S.D</b>
Maintenance services are done regularly	3.69	7.07
Maintenance services are done when there is less work or when equipment breaks down.	2.29	4.36
Company undertakes regular inspection of its products and facilities.	3.74	4.87
<b>Group Average</b>	<b>3.24</b>	<b>5.43</b>

The study revealed that maintenance services are never done when there is less work or when the equipment breaks down.

#### 4.2.10. Managing inventory

The findings were as shown in Table 11. The firms use computer software (mean = 4.59) for inventory management. Orders were also placed depending on customer demand (mean = 4.26) as opposed to depending on cost (mean = 2.34).

Table 11: Inventory Management

<b>Inventory Management</b>	<b>Mean</b>	<b>S.D</b>
Company uses computer software to manage its inventory	4.59	10.43
Goods are often disposed off without selling to customers.	2.89	3.08
Company orders at specific times in the year.	2.11	5.00
Company orders for goods randomly depending on demand.	4.37	8.19
Cost determines the amount of goods to be ordered.	2.34	3.81
Company considers discounts offered by various suppliers when ordering for goods.	3.26	3.00
Orders are placed depending on customer demand.	4.26	7.38
Orders are placed depending on prior agreements with suppliers.	3.06	5.83
<b>Group Average</b>	<b>3.36</b>	<b>5.84</b>

Similarly, firms ordered for goods randomly throughout the year depending on demand (mean = 4.37) and not at specific times in the year (mean = 2.11).

The study also shows that discounts offered are considered when ordering for goods (mean = 3.26). Prior agreements with suppliers were honored when placing orders.



### 4.3 ADDITIONAL INFORMATION

This section had four open-ended questions to give further information on the findings of section two. The findings are as shown in Table 12.

Table 12: Additional Information

<b>8.</b>	<b>Improving relationship with suppliers</b>	<b>%</b>
	Better customer care	32
	Quality improvement	24
	Coordination using IT	44
	<b>Total</b>	<b>100</b>
<b>9.</b>	<b>Company's overall Operations strategy</b>	
	Reduce costs	33
	Emphasize on value	47
	Employee needs	13
	Proper inventory management	7
	<b>Total</b>	<b>100</b>
<b>10.</b>	<b>Challenges in managing inventory</b>	
	Frequent changes in products & short shelf –life.	60
	Product customization	7
	Coordination along the supply chain	20
	Illegal imports	13
	<b>Total</b>	<b>100</b>
<b>11.</b>	<b>Practices to adopt to improve operations</b>	
	Improve customer relations	37
	Quality improvements	13
	Coordination among departments	25
	Better marketing strategies & IT	25
	<b>Total</b>	<b>100</b>

Question 8 required respondents to answer the three most important items they would change in order to improve the relationship between suppliers, distributors and the customer. Majority, 44%, said they would install information systems in place to enhance information sharing within the supply chain, 32% of the respondents said they would improve customer care while 24% would set in place quality improvement techniques. Earlier findings showed poor supply chain management practices. Majority, therefore feel that this can be improved by using technology.

The next question (9) sought to identify companies' overall operations strategy. Of the respondents, 47% emphasized on creating value for the customer, 37% aim to

continuously reduce their costs, 13% seek to satisfy employee needs while the 7% focus on ensuring proper inventory management. The four results emphasized the various aspects of operations management practices. Since none of the practices had a perfect score it implies that the firms' management recognized the need to improve on their operations.

Question 10 sought to understand what challenges these firms experience in managing their inventory. Majority, 60%, face problems of short shelf-life products and frequent changes in product formulations or appearance. This meant launching the product a fresh into the market.

Coordination among various departments was a problem towards effective inventory management. This was according to 20% of the respondents. Parallel importation by some traders interfered with the demand forecasting of certain companies, 13%. And finally, ensuring the storage facilities are kept in accordance with the requirements of various products remained a problem to 7% of the respondents.

The final part of this section sought the respondents' personal opinion on how to improve the firm's operations by making them more effective and efficient. The results were as shown in Table 12.

#### **4.4 SUMMARY OF FINDINGS**

Table 13 shows the summary of findings arranged from the operations management practice noticeably adopted down to those that are slightly practiced i.e. from the highest mean score to the lowest mean score. The study had a global average score of 3.22; implying pharmaceutical companies apply operations management practices. Going by the above score of 3.22 and considering a likert scale of 1-5, which was used in this case, the study shows that operations management practices are being applied. However, based on the score a lot of work needs to be done by the pharmaceutical companies if they are to achieve operational excellence expected in a world class operations management.

The table equally gives the answer to the first objective of the study which was to determine the extent of application of operations management practices by pharmaceutical companies in Kenya.

Table 13: Summary of findings

	<b>Operations Management Practice</b>	<b>Mean</b>	<b>S.D</b>
1.	Design of goods and services	4.02	6.38
2.	Location Strategy	3.54	8.23
3.	Inventory Management	3.36	5.84
4.	Human Resources and Job Design	3.33	5.69
5.	Layout Strategy	3.25	5.22
6.	Maintenance	3.24	5.43
7.	Quality Management	3.14	4.01
8.	Supply Chain Management	3.00	4.28
9.	Scheduling	2.72	3.77
10.	Process and Capacity Design	2.58	5.31
	<b>Global Average</b>	<b>3.22</b>	

It is also evident from table 13 that all the operations management practices are being applied except process and capacity design and scheduling that were being undertaken faintly. This answered the second objective which was to determine the operations management practices adopted by pharmaceutical companies in Kenya. Though 64% of companies did not have dedicated operations department, eight out ten practices were nevertheless being strongly practiced. These were being done under various other departments within the company creating a situation where most of the operations functions are indistinct and overlapping.

Design of goods and services was largely applied within the pharmaceutical industry (mean 4.02). Being a competitive industry, the products have to be appealing and differentiated so as to capture and retain customers. Location was equally considered (mean 3.54).

The firms undertook inventory management (mean 3.36) using information and technology which implied companies had a reliable way of forecasting demand to enable them know how much to order and when to order.

The study established that human resources and job design is practiced (mean 3.33). The main objective of human resources and job design in operations management

practices is to manage labor and design jobs so that people are effectively and efficiently utilized.

The study found that there was an extent of layout strategy in their operations (mean 3.25). This is to ensure a smooth and safe flow of work, material, people and information through the system.

The study also revealed that companies adhere to the requirements of maintenance in operations management practice (mean 3.24). Firms undertook maintenance services regularly without waiting for the machines to breakdown or when there was less work.

When it came to quality, the study found that there was a bigger emphasis on external customers. From the study, pharmaceutical companies have not achieved the level of synchronization that would be responsive to the customer needs and lower costs (mean 3.00).

Objectives of scheduling are to minimize job lateness, meeting customer due dates, minimizing overtime and idle-time and maximizing labor utilization.

Finally, the study also revealed that firms slightly engaged in process and capacity design (mean 2.58). The companies were however, able to manage demand by ordering randomly within the year.

## **CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS**

This chapter presents the conclusions and recommendations arising from this study and suggestions for further research.

### **5.1 CONCLUSION**

The objectives of this study were to determine the extent of application of operations management practices and also determine the operations management practices adopted by pharmaceutical companies in Kenya. It is evident that operations management is undertaken in the Kenyan pharmaceutical industry. The study revealed it is still in its infancy but its significance is well appreciated. The study has also revealed that most of the ten critical decisions in operations management are being practiced except for scheduling and process and capacity design.

Operations management is an important functional area because it plays a crucial role in determining how well an organization satisfies its customers. True to its importance, Kenyan pharmaceutical companies are equally involved in the design, management, and improvement of their systems so as to grow and achieve operational excellence.

The standard deviation achieved in this study was both higher than expected and quite irregular. This was an indication of the variability in the data. This unevenness could be attributed to the differences in the management styles of the various companies which depended on their countries of origin. Another cause of the inconsistencies could be due to different levels of qualifications of the respondents. This had an effect on their understanding of the questionnaire and hence eventual response. For example some respondents had doctorates, some were qualified pharmacists, others had training in business management and yet some only had diploma qualifications in pharmacy.

### **5.2 RECOMMENDATIONS**

The study revealed the role played by operations management practices in pharmaceutical companies operating in Kenya. It was evident that pharmaceutical companies operating in Kenya were more focused on the external customer. They were the main source of revenue for the company hence more was being done to satisfy their needs. Given the broad-based nature of operations management practices, pharmaceutical companies operating in Kenya, must facilitate both vertical

and horizontal employee interaction and communication as one way of benefiting the internal customer. Frequent work – related dialogue within the companies should be encouraged to not only share objectives but also to encourage innovation and creativity.

Firms did not make long term investments as can be seen in the design of offices, which had no room for expansion. Similarly, more robust systems to ensure quality were not in place as they required a long time for the benefits to be seen. This short sightedness must be done away with and likewise planning be done for long term projects. Substantial investments need to be made on quality control tools so as to achieve total quality which would enable the firms strive towards world class status.

The firms did not achieve the level of synchronization that would be required in an ideal supply chain management. The firms need to work at gathering feedback from suppliers and customers on how to improve their systems. Technical support and assistance should be provided to distributors and other customers both upstream and downstream.

There is need for players in the pharmaceutical industry to broaden the range of functions within the firms to include operations departments. They particularly need to embrace operations management professionals so as to build capacity for operations management. Effective operations management begins and ends with the customer. The modern view is that every member of every organization has customers at the next processes, where one's work goes next. That implies consistently improving on quality as judged by the customers. And customers' judgment can only be received through effective feedback mechanism.

Finally, firms need to invest sufficient resources in these critical decisions and continuously improve if they are to achieve a competitive advantage that would improve on their profitability and stability.

### **5.3 LIMITATIONS OF THE STUDY**

Some potential respondents indicated unwillingness to participate in the study while others felt they were junior staff members unable to respond to the questionnaire used in data collection. Some firms failed to respond to the questionnaire. Others did not provide answers to some questions especially the open-ended questions citing confidentiality. This had the net effect of reducing the amount of data accessible.

It was also apparent in a number of cases that some respondents did not understand the concept of operations management practices and the researcher was called upon quite often to explain. Therefore, some responses were not clear and the researcher had to determine where to categorize them. Due to time limitation, it was not possible to interview the respondents or wait much longer for the respondents' answer.

#### **5.4 SUGGESTIONS FOR FURTHER RESEARCH**

This research was limited to the operations management practices undertaken by pharmaceutical companies operating in Kenya. Research could also be undertaken to determine if the firms had different levels of applying operations management practices depending on their countries of origin. Research could also be undertaken to determine if firms with larger turnovers had better practices compared to those with lower turnovers. This would explain if their financial strength gave them the muscle to implement the critical decisions as required.

Finally, research could be undertaken to determine if firms with operations departments had the best operations management practices. This would provide information that can be used for benchmarking among pharmaceutical companies in the country. It would help explain whether it is necessary to have a fully fledged operations department for a firm to have the best practice or to just blend the practices with other departments.



**UNIVERSITY OF NAIROBI**  
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**MBA PROGRAMME**

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P.O. Box 30197  
 Nairobi, Kenya

DATE.....

**TO WHOM IT MAY CONCERN**

The bearer of this letter D. NYANGO KENNEDY OUMBO.....


Registration No. DE116002012010.....

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

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

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

Thank you.

  
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**DR. W.N. IRAKI**  
**CO-ORDINATOR, MBA PROGRAM**

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**APPENDIX II: QUESTIONNAIRE**

Kindly answer the following questions by ticking in the appropriate box or filling the spaces provided.

**PART A: GENERAL INFORMATION**

- 1. Position of respondent: .....
- 2. Does your company have an operations department?      Yes [ ] No [ ]
- 3. Does your company have an operations plan?              Yes [ ] No [ ]

**PART B: OPERATIONS MANAGEMENT PRACTICES**

4. Indicate on a scale of 1-5 to what extent you agree with the following about your company.

1=Strongly disagree    2=Disagree    3=Neither agree nor disagree    4= Agree  
5=Strongly Agree

	1	2	3	4	5
<b>Quality Management</b>					
Company has a quality management system in place.					
Company carries out studies to evaluate customer satisfaction.					
Company welcomes and acts on customers' complaints.					
Quality is determined through acceptance sampling.					
Company relies on feedback from Pharmacy and Poisons board on quality of its products.					
There is continuous improvement on handling of customers.					
Staff are continuously trained and educated on quality programs.					
<b>Location Strategy</b>					
Location is close to customers.					
Distribution, Transportation and other utilities are easily accessible.					
Affordable rent and Leasing costs.					
Labor easily available					

	1	2	3	4	5
<b>Human Resources and Job Design</b>					
There is a system for collecting employees' opinions.					
There is a strong spirit of cooperation in the organization.					
Employees fully understand the goals, policies, and objectives of this organization.					
Supervisors provide feedback to employees on how well they are doing.					
Management gives priority to employees' personal welfare.					
Employees have access to all the training they need.					
Employees understand their duties and are never idle.					
<b>Supply Chain Management</b>					
Suppliers operate as separate entities with their own goals.					
The company deals with a few prequalified suppliers.					
Company gathers feedback from distributors and customers on how to improve the systems.					
The company provides technical assistance to suppliers, distributors and customers.					
The company can locate and track movement of items.					
<b>Inventory Management</b>					
Company uses computer software to manage its inventory					
Goods are often disposed off without selling to customers.					
Company orders at specific times in the year.					
Company orders for goods randomly depending on demand.					
Cost determines the amount of goods to be ordered.					
Company considers discounts offered by various suppliers when ordering for goods.					
Orders are placed depending on customer demand.					
Orders are placed depending on prior agreements with suppliers.					

	1	2	3	4	5
<b>Maintenance</b>					
Maintenance services are done regularly					
Maintenance services are done when there is less work or when equipment breaks down.					
Company undertakes regular inspection of its products and facilities.					
<b>Scheduling</b>					
Company maintains constant production and supply.					
Company hires more workers when demand increases.					
Increasing or decreasing working hours depending on demand.					
Employees work overtime more often to clear backlogs.					
<b>Process and Capacity Design</b>					
Company does invest in systems that require along time for benefits to be seen.					
Company is able to respond to changes in demand quickly.					
Subcontracts work to other firms when demand is high.					
Company is able to forecast demand accurately.					
<b>Layout Strategy</b>					
Departments are divided based on similarity of duties.					
Divisions are grouped depending on products they deal with.					
Divisions operate according to their geographical locations.					
Designed for ease of future expansion and improvement.					
To make it easy to move goods from one section to another.					
Properly utilize the space available.					
It is easy for employees to communicate with one another.					
To ensure safety of employees.					

	1	2	3	4	5
<b>Design of goods and services</b>					
To comply with the legal requirements in the country.					
Make the products easily acceptable in the market.					
Make the products appealing to customers.					
Make products that are able to satisfy customers'					
To achieve competitive advantage					
Company follows keenly on what competitor has in the market					
To minimize the cost of the product.					

**PART C: ADDITIONAL INFORMATION**

5. Given an opportunity to improve the relationship between your suppliers, distributor and customer. What are three most important items you would do first?

.....  
.....  
.....

6. What is your company's overall operations strategy?

.....  
.....  
.....

7. What challenges does your company experience in managing inventory?

.....  
.....  
.....  
.....

8. In your opinion what are some of the practices that your company can adopt to make its operations more effective and efficient?

.....  
.....  
.....

**THANK YOU FOR YOUR TIME**

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## Name of Companies surveyed

<b>US &amp; Europe Companies</b>	<b>African Companies</b>
Human Bio Plazma LLC	Lab & Allied
Eli Lilly	Pharmaco Distribution
Pharmathen	Sphinx
Mepha	Universal Corporation Ltd
MSD	Biodeal
Bayer East Africa	Cosmos Ltd
DWD	
Alston Garrard	<b>Middle East Companies</b>
Novartis	Hikma
Reckit Benckiser	Gulf Pharmaceuticals
Menarini	
Prodes Pharma	<b>Asia Companies</b>
Roche	IPCA
GSK	Popular Pharmaceuticals
Kamada	Novell Pharmaceuticals
Astra Zeneca	Micro Labs
Actavis	Glenmark
Pfizer	Intas
Merck	Meditab
Schering Plough	Win Medicare
Servier	Cipla Ltd
Sanofi Aventis	Sun Pharmaceuticals
Abbott Laboratories	Orchid Healthcare
Ansell Medical	Synermed
Bell's Healthcare	Aurolab
Boehringer Ingelheim Int'l	Comed Chemicals
Bristol-Meyers squibb	Getz pharmaceuticals
Dafra Pharmaceuticals Ltd	Himalaya Pharmaceuticals
Denk Pharmaceuticals	Alembic
Janssen Cilag	