

**TOTAL QUALITY MANAGEMENT AND  
PERFORMANCE OF PHARMACEUTICAL  
MANUFACTURING AND DISTRIBUTING FIRMS IN  
KENYA**

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## DECLARATION

This research project is my original work and has not been presented for a degree award in any other institution.

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

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## **DEDICATION**

I dedicate this study to my parents Samuel and Millicent who taught me the virtues of determination, hard work and persistence. I also dedicate this work to all my siblings Rachael, Rebecca, Mary, Purity and nephew Melkizedeck. May this be an inspiration to you all and to generations to come to strive for even much greater heights.

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## **LIST OF ABBREVIATIONS**

<b>TQM</b>	Total Quality Management
<b>SRM</b>	Supplier relationship management

## **ABSTRACT**

Principals of total quality management as a management approach contribute to long-term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work. Thus, the aim of conducting this study was to determine the relationship between Principals of total quality management and performance in pharmaceutical manufacturing and distribution firms in Kenya. The study adopted a cross sectional survey. The target population comprised of 60 pharmaceutical manufacturing and distribution firms in Kenya. Systematic random sampling method was used since each and every member of the population had an equal chance of being selected as a sample. Primary data was collected using questionnaires. Data collected was analyzed by use of descriptive statistics using SPSS and presented through the percentages, frequencies, means, standards deviations and regression analysis. The information was then presented by use of tables and prose-form. The study found that Principals of total quality management greatly affected performance of pharmaceutical manufacturing and distribution firms in Kenya. Results using SPSS support the hypotheses that there is a positive relationship between principals of total quality management and performance of Kenyan pharmaceutical manufacturing and distribution firms. Furthermore, it is also found that customer focus is perceived as a dominant TQM practice for enhancing performance. Moreover, this study also provides a valuable knowledge to the top managers. Practical implementations along with the limitations have also been discussed in this study.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background

Customers are becoming increasingly aware of rising standards, having access to wide range of products and services to choose from. There is an ever-increasing demand for quality product and/or services and this global revolution has forced organizations to invest substantial resources in adopting and implementing Total Quality Management (Shekhar & Joshi, 2011).

To be successful in the marketplace, each part of the organization must work properly together towards the same goals, recognizing that each person and each activity affects and in turn is affected by others. To improve competitiveness, organizations are looking for a higher level of effectiveness across all functions and processes and are choosing TQM as a strategy to stay in business (Baidoun, 2010).

Continuously improving business processes is of increasing importance for companies looking to stay competitive in today's global markets. For society, there is a strong need to keep jobs by realizing and utilizing the potential in existing businesses. Companies need to compete both by bringing new products to the market and by improving existing products and processes. Dale (2010) emphasizes that continuous improvement in the total business activities with a focus on the customer throughout the entire organization and an emphasis of flexibility and quality are some of the main means by which companies face up to competitive threats. This is why quality and its management and the associated continual improvement are looked upon by many organizations as the means by which they can survive and maintain a competitive edge over their rivals. Companies that do not manage change will fail. Total quality is a major factor in the business quality revolution that has proven itself to be one of the

20th century's most powerful creators of sales and revenue growth, genuinely good new jobs, and soundly based and sustainable businesses expansion (Dale, 2010).

### **1.1.1 Total Quality Management**

Total Quality Management (TQM) is an approach that seeks to improve quality and performance which will meet or exceed customer expectations. This can be achieved by integrating all quality-related functions and processes throughout the company. TQM looks at the overall quality measures used by a company including managing quality design and development, quality control and maintenance, quality improvement, and quality assurance. TQM takes into account all quality measures at all levels while involving all company employees (Murray, 2009). TQM is a philosophy aiming at continuous improvement and involvement of the whole organization starting from the top of the hierarchy and ending at the bottom level of employees (Ndirangu, 2014).

Quality is achieved when customers' expressed and implied requirements are met fully. This is a core statement from which some eminent definitions of quality have been derived. They include: the totality of features and characteristics of a product or service that bears on its ability to meet a stated or implied need (ISO, 1994), fitness for use Juran (1988), and conformance to requirement (Crosby, 1979). It is important to note that satisfying the customers' needs and expectations is the main factor in all these definitions. Therefore it is an imperative for a company to identify such needs early in the product/service development cycle. The ability to define accurately the needs related to design, performance, price, safety, delivery, and other business activities and processes will place a firm ahead of its competitors in the market (Beaumont, 1997). Total quality is a strategic integrated system for achieving

customer satisfaction that involves all managers and employees and uses quantitative methods to continuously improve an organization's processes (Braxton 2013).

TQM practices can be classified as both external and internal. External TQM practices are those factors, which will influence the future of TQM from without the TQM discourse. The technology, markets and environmental drivers are all classed as external drivers. Internal TQM practices are a management approach aimed at incorporating awareness of quality in all organizational processes (Oakland, 1999). These are issues within the TQM movement. Internal TQM practices are those factors which will influence the future of TQM from within the TQM discourse. They includes; focus on the customer, long term commitment and leadership, top management support and direction, employee empowerment and involvement, effective and renewed communication, commitment to training, importance of rewards and recognition and reliance on standards and measures (McAdam & Henderson, 2002).

TQM offers many benefits when properly implemented, such as reduced scrap and rework, the elimination of defects, reduced levels of cost, increased levels of productivity & efficiency and better employee morale. Chin & Pun (2002) stated that successful TQM implementation will result in improved products and services, more satisfied employees and customers, reduced costs and an improvement in the organizational financial improvement. There are a number of barriers that face the process of TQM implementation) which are identified as follows; competitive markets, bad attitudes/abdication of responsibility/management infallibility, lack of leadership for quality, deficiency of cultural dynamism, inadequate resources for total quality management, lack of customer focus, lack of effective measurement of quality

improvement, poor planning, lack of management commitment, resistance of the workforce and lack of proper training (Ustadh 2012).

### **1.1.2 Performance**

Performance is the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed. In a contract, performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract (Karen, 2009).

Performance measurement is a fundamental building block of TQM and a total quality organization. Historically; organizations have always measured performance in some way through the financial Performance, and be this success by profit or failure through liquidation. In a successful total quality organization, performance will be measured by the improvements seen by the customer as well as by the results delivered to other stakeholders, such as the shareholders (Katherine & Cowell, 2010).

The manufacturing sector is one in which there is significant scope for performance measurement, as most aspects of the production process can be accurately measured in quantitative terms. An indication of the way manufacturers can measure their performance is provided by the Quality-Cost-Delivery (QCD) system. This comprises seven key measures which between them capture some of the key drivers of most manufacturing operations. The seven QCD measures are: Not Right First Time, Stock Turns, Overall Equipment Effectiveness, People Productivity, Floor Space Utilization, Delivery Schedule Achievement and Value Added per Person (KCTS, 2009).

### **1.1.3 Total Quality Management and Performance**

Recent research on total quality management has examined the relationships between the Total quality management and performance. Many researchers have examined the link between total quality management (TQM) and performance. Researchers such as Gurd & Smith, provide evidence to show that effective TQM implementations improve long-term profitability and stock returns. Flynn et al report that higher intensity of TQM practices results in improved quality performance. In a review of the literature covering the relationship between TQM and innovation, Prajogo and Sohal, identified two competing arguments.

The first argument suggests that TQM is positively related to innovation performance because it establishes a system and culture that will provide a fertile environment for organizations to innovate. The opposing argument holds that the implementation of TQM principles and practices could hinder organizations from being innovative. There is a growing body of empirical research supporting a direct relationship between the adoption of Total Quality Management (TQM) and improved firm performance. Reed et al argue that the content of TQM can be distinguished based on the issue of two business orientations: customer orientation and process orientation. With customer orientation, organizations will focus on gaining a market advantage where they can outperform their competitors in terms of attracting more customers with distinguished products and charge a premium price.

Dean and Bowen argue that from a strategic management perspective, TQM is concerned more with strategy implementation, or deployment, rather than strategic choice, or intent. Another strong implication about the association between TQM and cost leadership. In their framework on strategic approaches to innovation, they label

TQM as a value leader since it places more emphasis on process innovation than product innovation. By focusing on process innovation, TQM can be linked to Porter's cost leadership strategy. Some studies have found that the use of TQM practices reduces manufacturing process variance, eliminates reworks and scraps, and improves quality performance. In addition, there is considerable anecdotal evidence Harmon and Peterson on the extent to which TQM initiatives enhance the potential for firms to improve their performance. Moreover, some studies have found that TQM firms do not outperform non-TQM firms.

#### **1.1.4 Pharmaceutical Manufacturing and Distribution in Kenya**

The process of converting raw chemicals into drugs that can be used for treating human beings is called the manufacture of pharmaceutical products. Noam Chomsky (1998).

The pharmaceutical industry in Kenya consists of three segments namely the manufacturers, distributors and retailers who play a major role in supporting the country's health sector. Various activities are conducted by these firms to finally produce the final product. The industry compounds, packages and repacks formulated drugs and processing bulk drugs into doses using predominantly imported active ingredients and recipients. The bulk of locally manufactured preparations are non-sterile, over-the counter (OTC) products. The number of companies engaged in manufacturing and distribution of pharmaceutical products in Kenya continue to expand, driven by the Government's efforts to promote local and foreign investment in the sector (Economic Survey, 2004). This has resulted in Kenya being currently the largest producer of pharmaceutical products in the Common Market for Eastern and Southern Africa (COMESA) region, supplying about 50% of the region's market. Out



of the region's estimated fifty recognized pharmaceutical manufacturers approximately thirty are based in Kenya.

The industry consists of about 30 licensed concerns include local manufacturing companies and large Multi-National Corporations (MNCs), subsidiaries or joint ventures. Most are located within Nairobi and its environs. These firms collectively employ over 2,000 people, about 65% of who work in direct production. The industry compounds and packages medicines, repacking formulated drugs and processing bulk drugs into doses, using predominantly imported active ingredients and excipients. The bulk of locally manufactured preparations are non-sterile, over-the-counter (OTC) products. The number of companies engaged in manufacturing and distribution of pharmaceutical products in Kenya continue to expand, driven by the Government's efforts to promote local and foreign investment in the sector (Elizabeth, 2012).

## **1.2 Statement of the Problem**

Cheroigin (2014) found out that if TQM is implemented properly, it produces a variety of benefits such as meeting the customers' needs, improved internal communication and better problem solving capacity of the firm. This research recommends that in order to get the full potential of TQM it is necessary to train all people at all levels in order to create TQM awareness, interest, desire and action. Thus, top management attention might be fruitfully focused on the development of appropriate training programs on TQM adoption and implementation. Similarly, managers should consider suppliers as business partners and for successful realization of TQM benefits.

A study by Mutua (2014) on quality management practices and financial performance of pharmaceuticals manufacturing firms in Kenya. The findings revealed that most pharmaceutical manufacturing firms that implemented quality management practices recorded high sales turnover leading to organizational performance. It recommended that pharmaceutical manufacturing firms in Kenya should benchmark themselves with the best performing firms globally in order to find out the quality management practices that the firms use in enhancing competitiveness.

Study done locally found out that Total Quality Management influences achievement of agility in pharmaceutical companies in Kenya to a great extent. Pharmaceutical manufacturing companies employ TQM to enhance quality of their products, enhance employee participation in their companies and hence employee satisfaction and also to achieve enhanced performance effectiveness and efficiency. It also can be deduced that creativity and innovation contributes most to the agility followed by TQM and then IT adoption. The study established that IT is at the center stage of achieving agility, (Misiko, 2014). Researches from other economies indicate that TQM is getting fast adopted in the pharmaceutical industry and the impact is measurable as in other sector. Therefore there is need to determine TQM adoption and impact it has in fast growing Pharmaceutical manufacturing and distribution industry in Kenya. This study sought to conduct an empirical enquiry to investigate the TQM entrenched in Kenya's pharmaceutical manufacturing and distributing firms in order to answer the following questions. To what extent are TQM practices entrenched among pharmaceutical manufacturing and distributing firms in Kenya? How far has TQM practice contributed to performance in pharmaceutical manufacturing and distributing firms in Kenya?

### **1.3 Research Objectives**

The objectives of this research therefore were:

- (i). To access the extent of implementation of total quality management in pharmaceutical manufacturing and distributing firms in Kenya
- (ii). To determine the contribution of total quality management on performance in pharmaceutical manufacturing and distributing firms in Kenya.

### **1.4 The value of the Study**

The study maybe used by Pharmacy and Poisons Board, to improve the regulation of the pharmaceutical manufacturing and distributing industry in ensuring that organizations in the field implement total quality management practices so that the benefits can be passed on to the customers. This study provides the management of pharmaceutical manufacturing and distributing firms with better understanding of its processes and identifies tools for implementing continual improvement programs that can lead to improved profitability thereby increasing shareholder value. The study can assist the management of pharmaceutical manufacturing and distributing firms to encourage innovation making the organization adaptable to change, motivate people for better quality, and integrate the business as a result of common purpose. All these provide the organization with a valuable and distinctive competitive edge.

The entire country could benefit from reduced cost to one of the primary ingredients of production of pharmaceutical drugs which would accelerate economic growth by reduced unemployment and increased exports to the region as imports decrease. This study adds to existing literature on TQM implementation in academic institutions. While students and lecturers may make references to this document, future researchers may decide to do more research based on the issues raised here.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter gives a review of the literature related to the study. The whole essence of this research is to get an understanding of the impact of TQM on the performance of Kenyan pharmaceutical manufacturing and distributing firms. In order to get complete understanding of the theory and practice, various studies have been analyzed and reviewed. This concerns the concept of total quality management, determinants of TQM practices, measures of performance improvement and the conceptual framework.

### **2.2 Paradigms of Total Quality Management**

Total Quality Management (TQM) has been studied by many authors and each of them has issued a particular view of this emerging science. Many paradigms of TQM can be found making us to understand the specificity of this type of management. TQM emerged in the industrial management of the 80s and derives from the concept of Total Quality Control, (Feigenbaum, 1961) Deming advice on improvement of organization's performances was by the following points: Create constancy of purpose toward improvement of product and service with the aim to become competitive, to stay in business and to provide jobs; Adopt the new philosophy; Cease dependence on mass inspection; require instead statistical evidence that quality is built in; End the practice of awarding business on price tag basis; instead minimize total cost; Institute training on the job; Institute leadership; Drive out fear in everyone in the company; Break down barriers between departments; Eliminate slogans, (they

create adversarial relationships; Eliminate work standards (quotas) on the factory floor. Substitute leadership and Institute a vigorous plan of education and self-improvement.

Feigenbaum's Benchmarks of Total Quality Management are: Quality is a companywide improvement process; Quality is what customer says it is; Quality and costs are a sum not a difference; Quality requires both individual and teamwork zealotry; Quality is a way of managing; Quality and innovation are mutually dependant; Quality is an ethic; Quality is most cost-effective and implemented with a total system connected with customers and suppliers. Final Crosby's Four Absolutes of Quality Management were; Quality is conformance to requirements; prevention not appraisal; Performance Standard (zero defects) and Price of non-conformance on cost of defects to the company.

### **2.3 Principals of Total Quality Management Practices**

The total quality management determinants are: top management commitment, their support and direction, customer focus, supplier relationships, employee involvement and empowerment, work environment and benchmarking. In other words, the company's top management commitment supported by good supplier relationship places customer at the center of the system and while using benchmarking as a quality tool with the right environment provided for its empowered employees. The result of this form of management is the company's quality improvement, customer satisfaction, its market consolidation and domination and the protection of natural and social environment (Shahab, Jia & Yong, 2010).

### **2.3.1 Top Management Commitment, Support and Direction**

Management commitment is not a gift. It is earned and maintained through hard work, loyalty, communication and good staff work. Commitment from top management may be the most critical factor in the success of any programs. Senior management commitment is essential to help get started with a TQM program. Often, the first step is to convince senior managers of the financial and wider benefits and overcome any barriers that they may have. One of the best ways to do this is to identify obvious areas of cost reduction and environmental improvement and where to make immediate savings through no-cost or low-cost measures (Anderson, 2007). Highlighted management concept as planning or organizing processes enables control of all types of resources in an organization, in order to reach a common vision. This will eventually transcend to continuous evolution of modern quality management as organization favorable respond to changes in business demands (Stoner et al., 1995).

### **2.3.2 Customer Focus**

Achieving customer focus involves ensuring that the whole organization, and not just frontline service staff, puts its customers first. All activities, from the planning of a new product to its production, marketing, and after-sales care, should be built around the customer. Every department and every employee should share the same customer-focused vision. This can be aided by practicing good customer relationship management and maintaining a customer relations program (LeBoeuf, 2000), Companies need to continually gather information by means of focus groups, market surveys, and customer interviews in order to stay in tune with what customers want. They must always remember that they would not be in business if it were not for their customers (Ferris, 2010).

### **2.3.3 Supplier Relationship Management (SRM)**

Supplier relationship management (SRM) is the discipline of strategically planning for, and managing, all interactions with third party organizations that supply goods and/or services to an organization in order to maximize the value of those interactions. Supplier Relationship Management (also called Vendor Relationship Management) is a set of principles, processes, and tools that can assist organizations to maximize relationship value with suppliers and minimize risk and management of overhead through the entire supplier relationship life cycle. Secondary, Supplier Relationship Management has two aspects, which are, Clear commitment between the supplier and the buyer, and the objective of understanding, agreeing, and whenever possible, codifying the interactions between them, (Scottish Government. (1997) and (McCue, and Johnson, 2010).

### **2.3.4 Effective and Renewed Communication**

Total quality management depends on communication that flows in all directions up, down and laterally. Internal and external customers have to let know suppliers what they need. Suppliers have to let know their customers what they can realistically provide (Brennan, 2007).

The success of an organization's quality efforts relies largely on focusing on the right objectives and its ability to communicate them to the customers both internal and external. For total quality to work, communication between all levels in the organization is vital. Because total quality is a game that everyone must play. Thus it's important to note that without effective communication, TQM will not work in an organization (American Management Association International, 2010).

### **2.3.5 Training and Development**

Training is absolutely vital to the success of TQM. The process usually begins with awareness training for teams of top level managers. This is followed by courses for teams of mid-level managers, and finally by courses for non-managers. Awareness training is followed by an identification of areas of concentration, or of functional areas where TQM will first be introduced. Implementing TQM requires additional skills training, which is also conducted in teams (World Academy Online, 2010). Kappelman and Prybutok (1995), emphasizes that training is a very important aspect in the implementation of a successful TQM program as it provides an opportunity to inform employees about the goal of TQM and also provide workers with the skills and knowledge needed to achieve those goals. Training also provides an opportunity to empower and motivate employees, reducing employee resistance and increases the chances of TQM success.

An appropriate system of recognition and reward is crucial to any company's TQM programme, particularly as the quality improvement process offers greater involvement opportunities for ordinary working people. Positive reinforcement through recognition and reward is essential for achievement through participative problem-solving projects. People work for achievement, advancement, increased responsibility, recognition job interest as well as money (Charantimath, 2006).

According to Pearson et al. (1995) employee involvement through teams such as self-manage teams, quality improvement teams, management teams, and executive steering committees allows organizations to benefit from the knowledge and skills the individuals bring to the organizational workplace. They emphasize the fact that



employees at all levels should be charged to review and change their work processes in an effort to improve the overall quality of the finished product and services.

### **2.3.6 Reliance on Standards and Measures**

According to World Academy (2010), measurement is the springboard to involvement, allowing the organization to initiate corrective action, set priorities and evaluate progress. Standards and measures should reflect customer requirements and changes that need to be introduced in the internal business of providing those requirements. The emphasis is on doing the right thing right the first time.

## **2.4 Measures of Performance**

It is crucial to monitor the performance of a business and understand how and what you need to measure before even considering how to improve. The key performance indicators of quality, cost and delivery (QCD) aim to raise standards in 7 key areas (quality of finished products, on-time delivery, staff productivity, stock levels, and efficiency of equipment, added value and floor space). Together the measures of QCD give a coherent and overall analysis of performance and provide the basis for continuous measurement and improvement by focusing your priorities (Manufacturing advisory service, 2009).

### **2.4.1 Right First Time**

Not right first time measures a products ability to match a specification and is expressed in ‘number of defect parts per million’. Not getting things right first time means wasted effort, wasted resources and wasted production time-all leading to excess costs. To the customer, it means interrupted production flow, poor quality and ultimately higher prices. Reducing RFT will help improve quality, cost and delivery. RFT can be measured internally and externally in the production cycle. A defective

unit is a unit that does not conform to specifications and may be scrapped or reworked (SSMT Industry Forum, 2010). Internally, defective units are identified within the production process. Externally, defective units are identified outside the production process, either from the supplier or at the customer's site. Putting customer satisfaction first means putting the external defect rate before other elements of the supply chain. A low defect rate means customers will receive higher quality parts and consequently, there will be fewer interruptions to the flow of production (SSMT Industry Forum, 2010). As 1%=10,000 parts per million and the use of this to record defects magnifies RFT for continuous improvement (SSMT Industry Forum, 2010).
$$RFT = \frac{\text{Quantity of defective units}}{\text{Total quantity of units supplied}} \times 10^6$$

#### **2.4.2 Stock Turns**

Stock Turns is a measure of how frequently the stock (raw material, work-in-progress and finished goods) are turned over in relation to the sales revenue of a product. Stock turn is an important measure because it reflects the level of control and coordination of materials that flow through the process. Inventory levels (by value or quantity) are key indicators of the leanness of the process and are directly related to the simplicity of production flows. In contrast, excess inventory means unnecessary cost. ST ratios reveal how much control a business has over a process. Improvements in ST could allow the supplier to respond faster to customer demands and work to much tighter schedules. Inventory of incoming parts measure the efficiency of the flow of materials from the supplier. Work-in-progress (WIP) indicates factory flow. The finished goods figure represents the available level of completed product for delivery to the customer. Faster throughput time and frequent deliveries to the customer will result in lower values for finished goods (SSMT Industry Forum, 2010).
$$ST = \frac{\text{Sales Turnover of a product}}{\text{Value of raw material} + \text{WIP} + \text{Finished Goods}}$$

### **2.4.3 Overall Equipment Effectiveness**

Overall Equipment Effectiveness measures the availability, performance and quality of a process. The OEE measure shows how well the business is utilizing its resources, including equipment and labor. OEE is calculated by combining three elements: availability, performance and quality. One needs to understand the level of each element, as well as knowing the OEE value. Comparison of the three element figures provides a focus for improvement (SSMT Industry Forum, 2010). Availability-expressed as a percentage, compares the planned and actual time of the process run. An example of an improvement in availability is the elimination of unplanned downtime, which interrupts the flow of production and customer delivery. Performance-expressed as a percentage, compares the actual and ideal output achieved during the running of the process. An improvement would be returning the cycle time of the process back to the ideal design specification of the equipment. Quality-expressed as a percentage, compares the number of good parts made against the total parts made. Quality improvements include reducing rework and scrap generated by the process (SSMT Industry Forum, 2010).  $OEE = \text{Availability \%} \times \text{Performance \%} \times \text{Quality \%}$  .

### **2.4.4 People Productivity**

People Productivity is a measure of ratio between the number of good units made and the number of direct operator hours it takes to make those units. Using this measure can help control the people cost associated with production. This objective is to maximize the PP figure by either reducing the direct operator involvement, or increasing the number of good units made. Work is defined under three divisions: Work which adds value in line with the customer specification, Work which does not add value, but is necessary under current conditions and Work which is wasteful and

counter-productive. A high PP can only be obtained when: Most of direct employees' work is adding value to the process, Non-value added work is reduced to minimum and Waste is eliminated (SSMT Industry Forum, 2010).  $PP = \frac{\text{Number of good units made}}{\text{Number of direct operator hours}}$ .

#### **2.4.5 Floor Space Utilization**

Floor Space Utilization is a measure of the sales revenue generated per square meter of factory floor space. This measure relates the value of the factory space to the generation of sales, and demonstrates how effective use of space can reduce the fixed cost element of the unit. The FSU measure can be applied at cell level or across the whole manufacturing site for internal benchmarking. High fixed costs, such as factory space, are not usually desirable and capital decisions that require expanded buildings can be expensive. So there is generally a strong desire to minimize the use of space taken by the manufacturing process (SSMT Industry Forum, 2010). In order to achieve an increased FSU value the floor space has to be reduced. This often means rethinking a process layout and eliminating inventory to reduce the necessary space to the minimum (SSMT Industry Forum, 2010).

#### **2.4.6 Delivery Schedule Achievement**

Delivery Schedule Achievement measures how well a supplier matches the planned delivery requirement of the customer. The ability to deliver products on time is fundamental to customer satisfaction. However, 100% on time delivery must be achieved without unnecessary additional costs such as special deliveries, overtime payments, increases in stocks, scrap or rework costs (SSMT Industry Forum, 2010). Late and early deliveries are regarded as failures and are called 'not on time' in the measure. Incorrect quantity deliveries are deliveries of too many or too few parts and

parts that don't conform to the job, even if they can be reworked. If a delivery is both 'not on time' and 'incorrect quantity' then count it only once (SSMT Industry Forum, 2010).  $DSA = \frac{\text{No. of planned deliveries} - [\text{No. of not on time} + \text{No. of incorrect quantity deliveries}]}{\text{No. of planned Deliveries}}$ .

#### **2.4.7 Value Added Per Person**

Value Added per Person is a financial measure that relates the number of direct people involved in the conversion process to add value to the product. The VAPP has a direct impact on the costs associated with a process and shows specifically how well people are used to transform materials into the finished product: Output value is the sales value of the unit after Production, Input value is the value of the raw material until before production and Direct employees are those employees without which the production process cannot operate (SSMT Industry Forum, 2010). The VAPP measure allows the production process to be controlled ensuring the maximum difference between output and input values. The output and input values reflect the difference between the final value of the end product and the value of raw materials and services used. An example of a VAPP improvement is absorbing up or down stream processes into the cell or factory while still maintaining the current number of direct employees (SSMT Industry Forum, 2010).  $VAPP = \frac{\text{Output Value} - \text{Input Value}}{\text{Number of Employees}}$ .

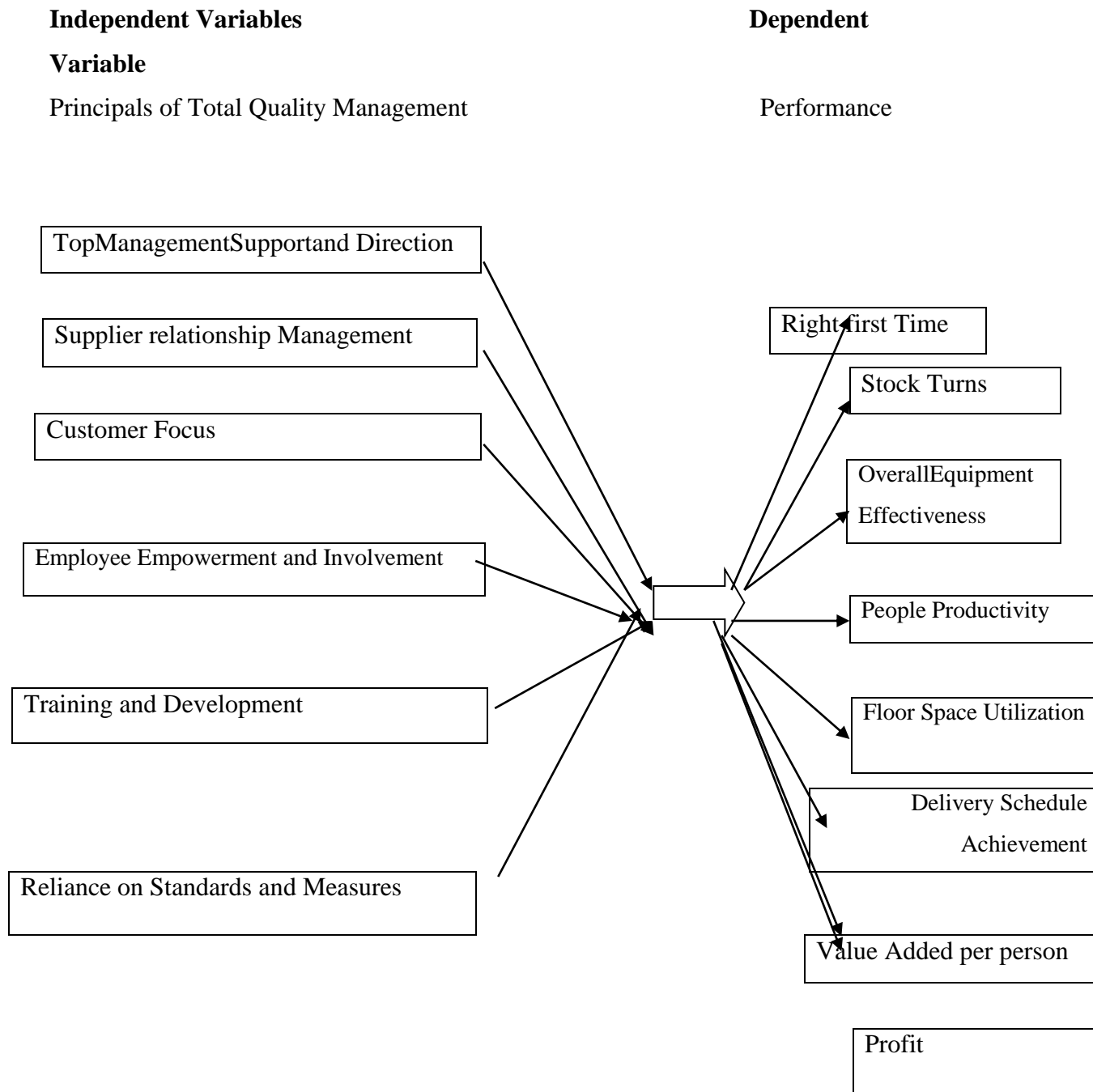
#### **2.5 Conceptual Framework**

Total quality management is considered to be an important management philosophy which supports the organizations in their efforts to obtain satisfied customers. The seven TQM practices implemented in small continuous steps that ensure that improvements are made at every stage as follows: the first and immediate goal of

most quality management practices is to improve internal quality performance measures (Steeple, 1992). Good quality practices resulting in the improvement of internal quality performance will lead to the improvement of external performance (Deming, 1986). Performance measures can be in terms of internal quality results, external quality results, business objectives, and business results, Any manufacturing unit should have a mechanism or system in place, to translate the plans or objectives into 26 measurable outputs so that every person in the organization knows exactly what output they are expected to produce and how to measure that (Sharma & Kodali, 2008).

During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels (Hashmi, 2000). People management can be considered as an important factor. But in place of people management change management can be considered because today's employee relationships and management are based on change initiation and implementation, with all the employees working together to make the change process a success (Capello, 2002).

**Figure 2.1: Conceptual Framework**



*Source: author (2013)*

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter sets out the research methodology that was adopted so as to meet the objectives stated in chapter one of this study. The research setting, the population of interest, sample, and data collection instruments and data analysis techniques is discussed.

### **3.2 Research Design**

The research adopted a cross sectional survey of pharmaceutical manufacturing and distributing firms in Nairobi County. The study was used to provide a comparative analysis of how various total quality management practices can contribute to the performance improvement in pharmaceutical manufacturing and distributing firms in Nairobi, Kenya, (Cooper and Schindler, 2008).

### **3.3 Population**

The target population was the sixty pharmaceutical manufacturing and distributing firms operating in Kenya in the study period of 2015. The population of registered pharmaceutical manufacturing and distributing firms in Kenya was provided by the pharmaceutical industry regulator in Kenya, Pharmacy and Poisons Board. The Board regulates the Practice of Pharmacy and the Manufacture and Trade in drugs and poisons. The list comprises firms engaged in the production of propriety /original products as well as those engaged in the manufacture and distributing of generic drugs (Elizabeth, 2012).

### **3.4 Sample Design**

A sample of 60 quality managers and supervisors was selected from 60 pharmaceutical manufacturing and distributing firms within Nairobi, each firm at least



one respondent. The method used was systematic random sampling method because in this method each and every member of the population had an equal chance of being selected as a sample. The selected sample was deemed adequate for general conclusions about the entire population. The sample was also adequate for the statistical tools which will be used in the data analysis, (Mugenda & Mugenda, 2003).

### **3.5 Data Collection**

Relevant data for analysis was primary data, which was obtained through the administration of structured questionnaires. The questionnaire was considered most appropriate because it allowed for collection of data from many respondents within a short time and provide a high degree of data standardization and adoption of generalized information amongst any populations. The questionnaire consisted of both closed and open-ended questions since this led to control over the data collected. Section A of the questionnaire sought to obtain firm data. Section B sought to obtain data on the TQM practices and Section C acquired data on the firm's performance for the last year.

### **3.6 Data Analysis**

Completed questionnaires were edited for uniformity, completeness and consistency. The questionnaires were coded to allow for statistical analysis. Social Package for Social Sciences data analysis program was utilized to generate inferential; multiple regression analysis & factor analysis and descriptive statistics; frequencies, percentages, mean and standard deviation from the respondents to establish the relative importance and weight for each variable. Ms excel spread sheet tools was utilized in presenting the quantitative data. The researcher used Multiple Regression Model, whereby the variables of interest are TQM practices (independent variables)

and Measures of performance improvement (dependent variable), (shahabalammalik 2010).

The model will be in the form of:

$$Y = \beta_0 + \beta_1 X_{1h} + \beta_2 X_{2h} + \beta_3 X_{3h} + \beta_4 X_{4h} + \beta_5 X_{5h} + \beta_6 X_{6h} + \beta_7 X_{7h} + \beta_8 X_{8h} + E$$

Where:

$\beta_0$  is the model's constant,

$\beta_1$  to  $\beta_8$  are the model's coefficients and Y is the firm's individual Measures of Performance

X variables are:

$X_1$ =Top Management Support & Direction,

$X_2$ =Customer Focus,

$X_3$ =Supplier Relationship Management (SRM),

$X_4$ =Employee Empowerment & Involvement,

$X_5$  = Effective & Renewed Communication,

$X_6$ =Training and Development,

$X_7$ =Importance of Rewards & Recognition

And  $X_8$ =Reliance on Standards & Measures. E is the error term.

For all the seven Measures of performance Improvement as above the formula is applied then

The researcher carried out a T-test confidence level to establish the significance of the independent variables in explaining the changes in the dependent variables.

## **CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION**

### **4.1 Introduction**

This section presents the analysis and findings from the primary data that was gathered from the respondents. All completed questionnaires were edited for completeness and consistency. Statistical Package for Social Sciences (SPSS) was used in statistical analysis. This chapter looked at the data to be analyzed, the regression analysis and interpretation.

#### **4.1.1 Response Rate**

The study utilized primary data gathered from the questionnaires dropped and picked by the researcher. The questionnaires targeted heads of production in small scale manufacturing firms in Nairobi. A total of 48 out of 60 questionnaires were completed and returned. This represents 80% response rate which can be used to draw conclusions.

**Table 4.1 Number of respondents**

<b>Target Respondents</b>	<b>Actual Respondents</b>	<b>Response rate (%)</b>
60	48	80%

Source: Research Findings (2015)

From table 4.1 above, the response rate was 48 (80%). The researcher deemed this as adequate and sufficient for the purpose of data analysis.

### 4.1.2 Size of the Company

The size of the firm can determine its level of investment in TQM initiatives. The respondents were asked to indicate the size of the company in terms of staff composition and the responses are as in table 4.2 below.

**Table 4.2: Size of the Company**

<b>Size of the Company</b>	<b>Frequency</b>	<b>Percentage (%)</b>
51 and above Employees	19	40%
31-50 Employees	13	27%
21-30 Employees	11	23%
11-20 Employees	5	10%
20 and below Employees	0	0

Source: Research Findings (2015)

From the findings in table 4.2 above, it was found that 19 (40%) of the firms had 51 and above employees, 13 (27%) had 31-50 employees, 11 (23%) of the firms had 21-30 employees while 5 (10%) had 11-20 employees. This is an indication that the firms that participated in this study have enough employees to undertake Total quality management Practices. Company size impedes the implementation of TQM practices. Larger companies tend to gain greater benefits from TQM than smaller firms.

### 4.1.3 Duration of Existence

The duration of existence can determine its level of investment in TQM initiatives. The respondents were asked to indicate the duration of existence in terms of number of years and the responses are as in table 4.3 below.

**Table 4.3 Duration of Existence**

<b>Duration of existence</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Above 21Years	22	46%
11-20Years	12	25%
6-10 Years	10	21%
0-5 Years	4	8%

Source: Research Findings (2015)

From the findings in table 4.3 above, it was found that 22 (46%) of the firms had been in existence for more than 21 years, 12 (25%) had been in existence for 11-20 years while 10 (21%) had operated for a period of 6-10 years. This is an expression that the firms that participated in this study have been in operation for a considerable period of time to undertake internal quality management practices. Duration of existence obstructs the implementation of TQM activities. Organizations that have been in operation for longer periods of time tend to gain greater benefits from TQM since their operations have been properly established than newer firms.

## **4.2 TQM Practices Implementation Benefits**

There are many benefits that can accrue from the implementation of TQM initiatives. The respondents were asked to respond appropriately on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.4 Implications of Customer Focus TQM practices in Pharmaceutical Manufacturing and Distributing Firms in Kenya**

<b>TQM Practices Implementation Benefits</b>	<b>Mean</b>	<b>Std. Dev</b>
The implementation of TQM has led to the maximization of organizational competitiveness	4.56	0.62
The implementation of TQM has led to quality improvement of products, services people, processes and environment.	4.41	0.61
The implementation of TQM has reduced scrap and rework	4.25	0.88
The implementation of TQM has led to the elimination of defects	4.13	0.66
The implementation of TQM has led to reduced levels of cost	3.84	0.81
The implementation of TQM has led to increased levels of productivity & efficiency and better employee morale	3.12	1.31
The implementation of TQM has led to an improvement in the organization's financial performance	3.01	0.72
The implementation of TQM has led to minimization of backlogs, late deliveries and surplus items	3.00	1.09

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), the firms that have implemented TQM initiatives have: realized quality improvement of products, services, people, processes and environment. Secondly, they have maximized their organizational competitiveness. Thirdly these firms have increased their levels of productivity, efficiency and employee morale. Moreover, these firms have improved their financial performance. Moderately ( $M > 3.0$ ), the firms that have implemented TQM initiatives have: realized minimization of backlogs, late deliveries and surplus items. In addition they have reduced scrap and rework. They have also eliminated defects and reduced their levels of cost. This implies that TQM implementation can lead to increased profitability hence the firm's level of competitiveness. This is in line with Njoroge Roselyn (2013)

who defined TQM as an approach of doing business that attempts to maximize the competitiveness of an organization through the continual improvement of the quality of its products, services, people, processes and environment.

#### 4.2.1 Customer Focus Practices

There are many gains that can accrue from the implementation of Customer Focus practices. The respondents were asked to respond appropriately to the following Customer Focus drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3= Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.5 Implications of TQM Practices Implementation Benefits on Operations of Pharmaceutical Manufacturing and Distributing Firms in Kenya**

Customer Focus practice	Mean	Std. Dev
The whole organization has implemented a philosophy of putting customer first	4.56	1.92
All activities in product design, production and marketing are built around the customer	4.46	1.72
Every department and every employee share the same customer-focused vision	4.09	0.30
Good customer relationship management is practiced and a customer relations program maintained	4.00	0.98
The firm continually gathers information in order to stay in tune with the customer's needs.	3.97	0.52

Source: Research Findings (2015)

To a great extent (M>4.0), the firms have implemented a philosophy of putting customer first. The firms also practice good customer relationship management and maintain a customer relations program. In addition, every department and every employee share the same customer-focused vision in these firms. Lastly, the firms continually gather information in order to stay in tune with the customer's needs.

Moderately (M>3.0), the firms cited that all activities in product design, production

and marketing are built around the customer. This signifies that Customer Focus drivers' implementation can lead to good customer relationship management hence better understanding of customers' needs, tastes and preferences. This is in agreement with LeBoeuf (2014) who argued that the first and overriding feature of TQM is the company's focus on its customers. Quality is defined as meeting or exceeding customer expectations. The goal is to first identify and then meet customer needs. TQM recognizes that a perfectly produced product has little value if it is not what the customer wants.

#### **4.2.2 Top management, Commitment, support and Direction TQM Practices**

**Table 4.6 Implications of Top management, Commitment, support and Direction Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Top management, Commitment, support and Direction practices</b>	<b>Mean</b>	<b>Std. Dev</b>
All senior and middle level managers demonstrate their seriousness and commitment to quality.	4.46	0.50
Supplier relationship Management has been the driving force behind TQM	4.31	0.64
Senior managers exhibit personal support by using quality improvement concepts in their management style.	3.81	1.20
Top management focuses on their managerial role and is active participant in decision implementation	3.41	0.79
Leaders prepare, review and monitor quality policy of the organization	3.16	0.98
Leaders develop a mission statement and strategies that are translated into action plans down through the organization	3.09	0.81

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), all senior and middle level managers have demonstrated their seriousness and commitment to quality. Secondly, TQM initiatives in these firms



start at the top with the leaders of the organization. Moderately ( $M > 3.0$ ), the firms have a sound quality policy that is supported by plans and facilities for implementing it. In addition, leaders develop a mission statement and strategies which are translated into action plans. In these firms leaders prepare, review and monitor quality policy. The firms' senior and middle level managers communicate the principles, strategies and benefits of TQM to the employees. This suggests that Long-term commitment and Leadership drivers' implementation can result to effective leadership hence the realization of a sound quality policy. This is in congruity with Cortanda and Woods, (2004) who argued that TQM must involve everyone. To be successful, it must start at the top with the leaders of the organization. All senior managers must demonstrate their seriousness and commitment to quality, and middle managers must, as well as demonstrating their commitment, ensure they communicate the principles, strategies and benefits to the people for whom they have responsibility.

#### **4.2.3 Supplier relationship Management TQM Practice**

There are many advantages that can accrue from the implementation of Supplier relationship Management TQM practice. The respondents were asked to respond appropriately to the following Top Management Support and Direction drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.7 Implications of Supplier relationship management TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Supplier relationship Management TQM Practice</b>	<b>Mean</b>	<b>Std. Dev</b>
Supplier relationship Management has been the driving force behind TQM	4.62	0.49
Senior managers exhibit personal support by using quality improvement concepts in their management style	4.18	0.72
Top management focuses on their managerial role and is active participant in decision implementation	4.03	1.06
Top management is fully involved in work process, with follow-ups and free flow of information	3.96	0.72
Management draws up a common vision that eventually transcend to continuous evolution of modern quality management	3.84	0.68

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), senior managers of these firms have exhibited personal support by using quality improvement concepts in their management style. Secondly, the firms' supplier relationship management has been the driving force behind TQM. Thirdly, the top management in these firms has focused on its managerial role and is an active participant in decision implementation. Moderately ( $M > 3.0$ ), management draws up a common vision that eventually transcend to continuous evolution of modern quality management. The firms also felt that top management has been fully involved in work process, with follow-ups and free flow of information.

#### **4.2.4 Employee Empowerment and Involvement TQM Practice**

There are many rewards that can accrue from the implementation of Employee empowerment and involvement initiatives. The respondents were asked to respond appropriately to the following Employee Empowerment and Involvement drivers on a

five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.8 Implications of Employee Empowerment and Involvement TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Employee Empowerment and Involvement TQM Practice</b>	<b>Mean</b>	<b>Std. Dev</b>
Managers give more discretion and autonomy to the front line employees	4.25	0.51
There exists employee involvement that allows the organization to benefit from knowledge and skills individuals bring to the workplace	3.94	0.84
Employees at all levels are charged to review and change their work processes in an effort to improve the overall quality of products	3.78	0.91
The management develops and communicates definitions clearly to the employees which eliminate ambiguity	3.69	0.86
Critical empowerment programs are designed to enable those with little or no power to overcome whatever form of domination that applies	3.59	0.56
Employees overcome domination by having control over key resources and having access to decision making process.	3.16	0.85

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), the firms involves employees and this allows them to benefit from knowledge and skills individuals bring to the workplace. Moderately ( $M > 3.0$ ), design of critical empowerment programs by the firms enable those with little or no power to overcome whatever form of domination that applies. The firms' management develops and communicates definitions clearly to the employees which eliminate ambiguity. Mangers in these firms also give more discretion and autonomy to the front line employees. In addition, employees of these firms are charged to review and change their work processes in an effort to improve the overall quality of products. Moreover, employees overcome domination by having control over key

resources and having access to decision making process. This insinuates that employee empowerment involvement drivers' implementation can result to shared responsibilities hence increased motivation and satisfaction of the employees. This is in concession with Pearson et al. (2014) who cited that employee involvement through teams such as self- manage teams, quality improvement teams, management teams, and executive steering committees allows organizations to benefit from the knowledge and skills the individuals bring to the organizational workplace.

#### 4.2.5 Communication TQM Practice

There are many merits that can accrue from the implementation of communication drivers. The respondents were asked to respond appropriately to the following Communication drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3= Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.9 Implications of Communication TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Communication TQM Practice</b>	<b>Mean</b>	<b>Std. Dev</b>
Communication is the life blood of your firm.	4.40	0.75
Communication has played a significant role in connection with the firm's quality issues.	4.18	0.85
Communication has been an important means of realizing quality goals of the firm.	4.03	0.54
There has been a strong relationship between good communication and successful quality implementation	3.16	1.39
Total quality management has depended on communication that flows in all directions up, down and laterally.	3.15	1.36
Communication between all levels in the organization is vital.	3.13	1.39

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), communication is the blood of these firms. Communication between all levels in the firm is vital. In addition, communication has been an important means of realizing quality goals of these firms. Moderately ( $M > 3.0$ ), the firms have a strong relationship between good communication and

successful quality implementation. Secondly, communication has played a significant role in connection with the firms' quality issues. Thirdly, total quality management in these firms depends on communication that flows in all directions up, down and laterally.

This presupposes that communication driver's implementation can result to the reduction of unnecessary competition within departments hence help employees work together harmoniously.

This is in conformity with Burroughs (2013) who stated that communication is the life blood of an organization and that it plays a significant role in connection with quality issues. He said that communication is an important means of realizing quality and that there is a strong relationship between good communication and successful quality implementation.

#### **4.2.6 Training TQM Practice**

There are many benefits that can accrue from the implementation of training drivers. The respondents were asked to respond appropriately to the following Training drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.10 Implications of Training TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

Training TQM Practice	Mean	Std. Dev
Training has been absolutely vital to the success of TQM.	4.30	0.47
Training has provided an opportunity to empower and motivate employees	4.15	0.60
Training has provided an opportunity to inform employees about the firm's goal of TQM.	4.00	0.73
The firm conducts awareness training for teams of top level managers, mid-level managers, and non-managers.	3.89	1.01
Training has provided workers with the skills and knowledge needed to achieve firm's TQM goals.	3.59	0.89
The firm has additional skills' training for successful TQM implementation	2.81	0.79

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), training has been absolutely vital to the success of TQM in these firms. Secondly, training has provided an opportunity to empower and motivate employees. Thirdly, training has provided an opportunity to inform employees about the firm's goal of TQM. Moderately ( $M > 3.0$ ), these firms conduct awareness training for teams of top level managers, mid-level managers, and non-managers. In addition, training has provided workers with the skills and knowledge needed to achieve firm's TQM goals. To a small extent ( $M \Rightarrow 2.0$ ), firms have additional skills' training for successful TQM implementation.

This denotes that training driver's implementation can result to the acquisition of the necessary knowledge and skills hence operational effectiveness and efficiency. This concurs with Kappelman & Prybutok (2012) who emphasized that training is a very important aspect in the implementation of a successful TQM program as it provides

an opportunity to inform employees about the goal of TQM and also provide workers with the skills and knowledge needed to achieve those goals.

#### 4.2.7 Rewards and Recognition TQM Practice

There are many gains that can accrue from the implementation of rewards and recognition drivers. The respondents were asked to respond appropriately to the following Rewards and Recognition drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.11 Implications of Rewards and Recognition TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Rewards and Recognition TQM Practice</b>	<b>Mean</b>	<b>Std. Dev</b>
Positive reinforcement through recognition and reward has helped the firm to achieve its quality goals	4.07	0.62
People work for achievement, advancement, increased responsibility, recognition, job interest as well as money	3.91	0.87
An appropriate system of recognition and reward has been crucial to the organization's TQM programme.	3.74	0.94
Managers give recognition and reward publicly to maximize their impact and effectiveness.	3.48	1.01
Managers always look for positive behavior to recognize and reward, rather than negative conduct to criticize.	3.23	0.95
Managers have a wide-range of recognition and reward options to match the ability of individual(s) involved.	2.93	0.92

Source: Research Findings (2015)

To a great extent ( $M > 4.0$ ), positive reinforcement through recognition has helped these firms achieve their quality goals. Moderately ( $M > 3.0$ ), people work for achievement, advancement, increased responsibility, recognition, job interest as well as money. Secondly, an appropriate system of recognition has been crucial to the

firms' TQM programme. Thirdly, managers give recognition publicly to maximize their impact and effectiveness. Lastly, managers always look for positive behavior to recognize. To a small extent (M=>2.0), managers of these firms have a wide-range of recognition and reward options to match the ability of individual(s) involved.

This implies that rewards and recognition driver's implementation can result to motivated employees hence a positive, productive and innovative organizational climate. This complies with Charantimath (2012) who said that an appropriate system of recognition and reward is crucial to any company's TQM programme, particularly as the quality improvement process offers greater involvement opportunities for ordinary working people. Positive reinforcement through recognition and reward is essential for achievement through participative problem-solving projects.

#### **4.2.8 Standards and Measures TQM Practice**

There are many benefits that can accrue from the implementation of standards and measures drivers. The respondents were asked to respond appropriately to the following Standards and Measures drivers on a five Likert scale where: (5= Very Great Extent, 4=Great Extent, 3=Moderately, 2=Small Extent and 1=Very Small Extent).

**Table 4.12 Implications of Standards and Measures TQM Practice in Pharmaceutical Manufacturing and distribution Firms in Kenya.**

<b>Standards and Measures TQM Practices</b>	<b>Mean</b>	<b>Std. Dev</b>
Standards and measures have helped the firm in reflecting customer requirements, preferences and changes	4.34	1.51
Measurement has allowed the organization in setting priorities	4.04	0.45
Measurement has allowed the organization to evaluate progress	4.01	0.47
Measurement has allowed the organization to initiate corrective action	3.92	0.41

Source: Research Findings (2015)



To a great extent (M>4.0), standards and measures have helped the firm in reflecting customer requirements, preferences and changes. These firms have also been allowed to set priorities. In addition, they have been allowed to evaluate progress. Moderately (M>3.0), measurement has allowed the firms to initiate corrective action. This hints that standards and measures drivers' implementation can result to doing the right thing right the first time. This is in compatibility with the World Academy (2013) who argued that measurement is the springboard to involvement, allowing the organization to initiate corrective action, set priorities and evaluate progress.

### **4.3 Performance Index for the last 3 years**

There are seven performance measures that are important in determining how a firm can raise standards in 7 key areas (quality of finished products, on-time delivery, staff productivity, stock levels, and efficiency of equipment, added value and floor space). The respondents were asked to respond appropriately to the following key performance indicators of quality, cost and delivery (QCD).

**Table 4.13 Mean Performance for the last five years among Pharmaceutical Manufacturing and Distribution Firms in Kenya**

<b>Performance Indicator</b>	<b>Unit of Measure</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Quantity of defective units	Parts Per Million	8%	7%	5%
Total quantity of units supplied	Parts Per Million	8	10	12
Value of raw material	Kenya Shillings	400M	450M	500M
Work-in-progress(WIP)	Numbers	1000	1100	1150
Equipment Availability	Percentage	40%	45%	50%
Equipment Performance	Percentage	60%	68%	75%
Equipment Quality	Percentage	80%	85%	92%
Number of good units made	Numbers	1000	1500	1800
Number of direct operator hours Per unit	Hours	8hrs	7.8hrs	7.3hrs
Sales Turnover of Model Area	Kenya Shillings	500M	560M	620M
Square meters of Model Area	Square Meters	4.45	3.75	3.10
Number of planned deliveries	Percentage	70%	78%	82%
Number of not-on-time deliveries	Percentage	12%	10.5%	8%
Number of incorrect quantity deliveries	Percentage	10%	9%	7%
Employee Output Value	Kenya Shillings	5.01	4.00	3.76
Employee Input Value	Kenya Shillings	3.76	4.91	5.01
Number of employees	Numbers	20	28	52

#### 4.4 Regression Analysis

The researcher conducted a multivariate regression analysis to establish the extent of the relationship between TQM practices (independent variables) and performance (dependent variable) of pharmaceutical manufacturing and distribution firms in Kenya. The researcher applied Statistical Package for Social Sciences (SPSS) to code, enter and compute the measurements of the multiple regressions for the study which was in form of:  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + E$  Where  $\beta_0$  is the model's constant,  $\beta_1$  to  $\beta_8$  are the model's coefficients and Y is the firm's performance improvement.  $X_1$  =Customer Focus,  $X_2$  =Long-Term Commitment & Leadership,  $X_3$ =Top Management Support & Direction,  $X_4$ = Employee Empowerment & Involvement,  $X_5$  = Effective & Renewed Communication,  $X_6$  = Commitment to Training,  $X_7$  = Importance of Rewards & Recognition and  $X_8$ = Reliance on Standards & Measures. E is the error term. The results of the regression were presented in the table below.

**Table 4.14 Model Summary**

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.897 <sup>a</sup>	.658	.626	3.703

a. Predictors: (Constant), TQM Practices,

Source: Research Findings (2015)

The independent variables that were studied explain only 65.8% of the performance of Pharmaceutical Manufacturing and Distribution firms in Kenya as represented by the R<sup>2</sup>. This can be taken to mean that the independent variables account for 65.8% of the firms' performance. This is an indication that they play a very significant role in

determining the performance of pharmaceutical manufacturing and distribution firms. This therefore means that other TQM Practices not studied in this research contribute 34.2% of the performance of pharmaceutical manufacturing and distribution firms in Kenya. Therefore further research should be conducted to investigate the TQM practices (36.3%) that affect performance of pharmaceutical manufacturing and distribution firms in Kenya.

**Table 4.15 ANOVA Results**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.725	8	.591	1.195	.021
Residual	25.208	51	.494		
Total	29.933	59			

Source: Research Findings (2015)

The significance value is .021<sup>a</sup> which is less than 0.05 thus the model is statistically significant in predicting how internal TQM practices influence the performance of pharmaceutical manufacturing and distribution firms in Kenya. The F critical at 5% level of significance was 1.195. Since F calculated is greater than the F critical (value=11.833), this shows that the overall model was significant.

**Table 4.16 Coefficients of Determination**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	2.119	.641		3.306	.002
	Top management	.128	.320	.140	.400	.001
	Supplier management	.094	.145	.156	.649	.000
	Employee empowerment	-.045	.248	-.073	-.183	.006
	Communication	.087	.515	.085	.169	.000
	Training development	.351	.552	.264	.636	.000
	Reward recognition	.478	.597	.409	.801	.027
	Standard measures	.115	.370	.106	.311	.057
	Customer focus	.104	.203	.174	.513	.010

Source: Research Findings (2015)

Multiple regression analysis was conducted to determine the relationship between performance and TQM Practice. The SPSS generated table above shows the weights of the various variables that were subjected to regression analysis. It is evident that there is a constant value of 2.119 which denotes the performance value when the independent variables are held constant. The independent variables have B values which indicate the weights that each is given. Based on the above results, the study derived a model that can be used to measure the performance among pharmaceutical manufacturing and distribution firms in Kenya. The following is the model:

$$Y=2.119+0.128X_1+0.094X_3-0.045X_4+0.087X_5+0.351X_6+0.478X_7+0.115X_8+0.104X_2$$

## 4.5 Factor Analysis

The researcher also carried out a factor analysis test which reduced independent variables and at the same time indicated the direction and strength of the relationship for each variable.

**Table 4.17: KMO and Bartlett's Test**

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>		.793
Bartlett's Test of Sphericity	Approx. Chi-square	51.302
	df	28
	Sig (p-value)	.002

Source: Research Findings (2015)

To determine the number of components, only the Eigen values greater than or equal to 1 were considered. In addition, the KMO measure and the Bartlett's sphericity test were affected. The extraction method was principle axis factoring; the rotation method was Varimax with Kaiser Normalization. With the recommended value of 0.6, in order to perform factor analysis in the KMO measure, it was necessary to perform factor analysis on the data since the KMO measure was 0.793.

**Table 4.18 Total Variance Explained**

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of variance	% Cumulative	Total	Total	% Cumulative
1	8.354	71.300	71.300	2.993	14.127	14.127
2	1.884	3.208	74.508	2.744	13.863	27.990
3	.803	3.102	77.610	1.934	12.130	40.120
4	.710	2.789	80.399	1.884	12.978	52.098
5	.623	2.546	82.945	1.803	21.478	73.198
6	.598	2.384	85.429			
7	.521	2.268	87.497			
8	.315	1.621	100.00			

Source: Research Findings (2015)

From the total variance explained table Eigen values (a measure of the variance explained by factors), factor extraction was done to determine the factors using Eigen values greater than 1. Factors with Eigen values less than 1.00 were not used because they account for less than the variation explained by a single variable. The result indicates that 8 variables were reduced into 5 factors. The five factors explain 73.11 % (cumulative percentage) of the total variation, the remaining 3 factors together account for 26.89% of the variance. The explained variation 73.11% is greater than 70% and therefore, factor analysis was important for reducing factors by putting similar ones together.

**Table 4.19: Factor Loading of Variables**

<b>Component</b>	<b>Factor</b>	<b>Reliability Coefficient</b>	<b>Eigen Value</b>
F1	Customer Focus	0.713	1.934
F2	Long-term commitment & leadership	0.850	1.884
F3	Top management support & direction	0.885	1.803
F4	Employee empowerment	0.785	1.710
F5	Training	0.884	1.623

Source: Research Findings (2015)

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization .The reliability in the factors was achieved through calculation of Cronbach Alpha coefficients it explains to what extent the variable in the study are explained by the factors. Factor one explains variable by 71.3% with the high Eigen value of 1.934 meaning that factor one is the leading factor in explaining internal TQM drivers for performance improvement among small-scale manufacturing firms

in Nairobi. The rank of each factor reduces with the reduction the level of Eigen value.

**Table 4.20: Factor Correlation Matrix**

Factor	F1	F2	F3	F4	F5
F1	1.000	.376	.324	.387	<b>.402</b>
F2	.376	1.000	.398	.371	.383
F3	.324	.398	1.000	.345	.312
F4	.387	.371	.345	1.000	.311
F5	<b>.402</b>	.383	.328	.311	1.000

Source: Research Findings (2015)

There is a low correlation between different factors, the maximum being 0.402 (between the factors ‘F1-Customer Focus and F5- Training’). This means that all the 5 factors are independent, which implies that they are measuring unrelated dimensions.



## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

In this chapter, the study presents the summary of findings on internal TQM drivers for performance improvement among small-scale manufacturing firms in Nairobi County. It also includes the conclusions and recommendations made based on the findings of the study. The chapter also gives suggestions for further study.

### **5.2 Summary of Findings**

The study found that TQM Practice Implementation Benefits which included quality improvement of products, services, people, processes & environment, maximization of competitiveness, increased productivity, efficiency & employee morale, improvement in financial performance greatly influenced the firms' performance improvement. Minimization of backlogs, late deliveries & surplus items, reduced scrap & rework, elimination of defects and reduced levels of cost influenced the firms' performance moderately. On Customer Focus Drivers, philosophy of putting customer first, customer relationship management practice & customer relations program maintenance, sharing of the same customer-focused vision and continuous gathering of information on customer's needs influenced performance improvement highly but activities in product design, production and marketing been built around the customer had less influence on performance improvement.

On Top Management Commitment and Leadership Practice, the demonstration of seriousness & commitment by all managers to quality and TQM initiatives starting with the leaders of the organization highly affected the firms' performance improvement while the existence of a sound quality policy, development of a mission

statement & strategies, leaders prepare, review & monitor quality policy and managers communicate the principles, strategies & benefits of TQM to the employees moderately affected performance improvement of small-scale firms. The study found out that aspect of Top Management Support and Direction Drivers which included senior manager's exhibition of personal support, top management being the driving force behind TQM and top management focus on managerial role & decision implementation greatly contributed to the firms' performance improvement. Management draws up a common vision and top management being fully involved in work process contributed moderately to firms' performance improvement.

On Employee Empowerment and Involvement Practices, the study concludes that existence of employee involvement have a major influence on the firm's performance improvement whereas design of critical empowerment programs, clear development and communication of definitions, employee discretion & autonomy, employees review and change work processes and employees overcome domination moderately influenced the firm's performance. The study found that aspects of Communication Practice which included communication as the life blood of the firm, importance of communication in the organization and communication as a means of realizing quality goals of the firm highly influenced the firm's performance improvement. Firms' performance was also moderately influenced by existence of a strong relationship between communication and quality implementation, connection of communication with the firm's quality issues and TQM dependency on communication.

On Training Practice, training been vital to the success of TQM, training has empowered and motivated employees and training has informed employees about the firm's goal of TQM influenced the firms' performance greatly while the firm

conducts awareness training for all and training has provided workers with the skills and knowledge moderately influenced the firms' performance but existence of additional skills' training had less influence on the firms' performance. The study found that among Rewards and Recognition Practice, positive reinforcement influenced firms' performance improvement to a great extent. People work for achievement, advancement, increased responsibility, recognition, job interest as well as money, importance of appropriate system of recognition and reward to the organization's TQM programme, managers give recognition and reward publicly and managers always look for positive behaviour to recognize and reward influenced firms' performance moderately. On the other hand, existence of a wide-range of recognition and reward options had a small effect on firms' performance improvement. The study established that Standards and Measures Practices which included helping the firm in reflecting customer requirements, preferences and changes, setting priorities and evaluating organizations' progress influenced the firms' performance to a great extent whereas initiating corrective action moderately influenced the firms' performance.

### **5.3 Conclusion**

From the findings, the study concludes that aspects of TQM Practices Implementation Benefits which includes; quality improvement of products, services, people, processes & environment, maximization of organizational competitiveness, increased productivity & efficiency & better employee morale and improvement in the organization's financial performance have a major effect on organization's performance. Practices of Customer Focus such as a philosophy of putting customer first, customer relationship management practice & customer relations program, customer-focused vision and continuous gathering of information on customer's

needs have a major influence on organization's performance. Top management Commitment and Leadership Practices like the demonstration of seriousness & commitment by all managers to quality and TQM initiatives starting at the top with the leaders of the organization also influence the firm's performance improvement very highly.

Top Management Support and Direction Practices which includes use of quality improvement concepts by senior managers, top management been the driving force behind TQM and top management active participation in decision implementation have a major influence on organization's performance. The only Employee Empowerment and Involvement practice that highly influences organization's performance is the existence of employee involvement that allows the organization to benefit from knowledge and skills individuals bring to the workplace. Practice of Communication such as communication been the life blood of the firm, communication been vital between all levels in the organization and communication been an important means of realizing quality goals of the firm have a major effect on organization's performance improvement.

Training Practice that have a high influence on the firms' performance includes training been absolutely vital to the success of TQM, employees been empowered & motivated and employees been informed about the firm's goal of TQM. The only Rewards and Recognition Practice that highly influences organization's performance is the positive reinforcement which has helped the firm achieve its quality goals. Standards and Measures Practice like reflecting customer requirements, preferences & changes, setting of priorities and evaluation of progress also influences the firm's performance very highly.

## **5.4 Recommendations**

Since the study confirmed that there was significant relationship between TQM Practices and performance, Pharmaceutical manufacturing and distribution firms in Kenya should be encouraged to embrace TQM Practices more in order to benefit from the concept. TQM system implementation have been associated with benefits like maximization of organizational competitiveness, minimization of backlogs, late deliveries and surplus items, reduced scrap and rework, elimination of defects, reduced levels of cost and quality improvement of products, services, people, processes and environment. It will be important for the pharmaceutical manufacturing and distribution firms to look for areas in TQM Practices where they can optimize on the mentioned benefits so that they can improve on their performance. It will also be prudent for other organizations to emulate the example of Pharmaceutical manufacturing and distributing firms in Kenya in adopting TQM Practices as a performance improvement tool.

## **5.5 Limitations of the Study**

The result of this study may have been affected by the following possible limitations;

- The small size of the sample 60 could have limited confidence in the results and this might limit generalizations to other situations. The study was based on pharmaceutical manufacturing and distribution firms within Nairobi County. The Pharmaceutical Manufacturing firms in Kenya may differ from those of other counties especially the rural ones. As such the results may not be generalized. The study relied on convenient sampling, as far the respondents were concerned. This may have an effect on the results. The study was a survey. The use of pre-determined questions may have forced respondents to respond to questions without even understanding them. Some respondents refused to fill in the questionnaires. This reduced the response rate to

80%. This reduced the probability of reaching a more conclusive study. However, conclusions were made with this response rate.

## **5.6 Suggestions for Further Study**

This research was broad. It dealt with many Principals of total quality management practices and performance measures. The researcher suggests that a future research could be done which could concentrate on each principal of total quality management individually and independently. This may give a deeper insight into such principals and their contribution in determination of organization's performance growth. There is need to conduct a study among pharmaceutical manufacturing and distribution firms in other regions of the world in order to establish whether there is any uniformity in the principals of total quality management that exist among all the pharmaceutical manufacturing and distribution firms in the world. A comparative study can also be carried out to establish the similarities and differences in the principals of total quality management among pharmaceutical manufacturing and distribution firms in Kenya and other regions in the world. Since times change and new concepts arise, it will be important to replicate this study in the future so as to establish whether the situation will still be the same.

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## APPENDICES

### APPENDIX I: RESEARCH QUESTIONNAIRE

**Section A:**

**Firm Data**

1. Name of Company: \_\_\_\_\_
2. Please indicate the size of the Company (No. of persons).  
 11-20 employees [ ]    21-30 employees [ ]    31-50 employees [ ]    51 add above [ ]
3. How long has the firm been in existence.....Years
4. Is the company locally or internationally owned?  
       Local [ ]    International [ ]

**Section B: TQM Practices**

1. Do you have quality management systems in your firm? Yes [ ] No [ ]
2. To what extent has your firm benefited from the implementation of TQM practices within its operations? (Please tick appropriately)

TQM System Implementation Benefits	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
The implementation of TQM has lead to the maximization of organizational competitiveness					
The implementation of TQM has lead to quality improvement of products, services people, processes and environment.					
The implementation of TQM has reduced scrap and rework					
The implementation of TQM has lead to the elimination of defects					
The implementation of TQM has lead to reduced levels of cost					
The implementation of TQM has lead to increased levels of productivity & efficiency and better employee morale					

The implementation of TQM has lead to an improvement in the organization's financial performance					
The implementation of TQM has lead to minimization of backlogs, late deliveries and surplus items					

3. To what extent has your firm implemented the following Customer Focus TQM practice? (Please tick appropriately)

Customer Focus practice	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
The whole organization has implemented a philosophy of putting customer first					
All activities in product design, production and marketing are built around the customer					
Every department and every employee share the same customer-focused vision					
Good customer relationship management is practiced and a customer relations program maintained					
The firm continually gathers information in order to stay in tune with the customer's needs.					

4. To what extent has your firm implemented the following, Top Management Commitment Support and Direction TQM practice? (Please tick appropriately)

Top Management Commitment Support and Direction	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
TQM initiatives in the firm start at the top with the leaders of the organization.					

All senior and middle level managers demonstrate their seriousness and commitment to quality.					
Senior and middle level managers Communicate the principles, strategies and benefits of TQM to the employees.					
The firm has a sound quality policy that is supported by plans and facilities to implement it.					
Leaders prepare, review and monitor quality policy of the organization					
Leaders develop a mission statement and strategies that are translated into action plans down through the organization					

5. To what extent has your firm implemented the following Supplier relationship Management TQM Practice? (Please tick appropriately)

Supplier relationship Management TQM Practice	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
Supplier relationship Management has been the driving force behind TQM					
Senior managers exhibit personal support by using quality improvement concepts in their management style.					
Top management focuses on their managerial role and is active participant in decision implementation					
Top management is fully involved in work process, with follow-ups and free flow of information					

Management draws up a common vision that eventually transcend to continuous evolution of modern quality management					
--------------------------------------------------------------------------------------------------------------------	--	--	--	--	--

6. To what extent has your firm implemented the following Employee Empowerment and Involvement TQM Practice? (Please tick appropriately)

Employee Empowerment and Involvement Drivers	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
Managers give more discretion and autonomy to the front line employees					
There exists employee involvement that allows the organization to benefit from knowledge and skills individuals bring to the workplace					
Employees at all levels are charged to review and change their work processes in an effort to improve the overall quality of products					
The management develops and communicates definitions clearly to the employees which eliminate ambiguity					
Critical empowerment programs are designed to enable those with little or no power to overcome whatever form of domination that applies					
Employees overcome domination by having control over key resources and having access to decision making process.					

7. To what extent has your firm implemented the following Communication TQM practice? (Please tick appropriately)

Communication Drivers	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
Communication is the life blood of your firm.					
Communication has played a significant role in connection with the firm's quality issues.					
Communication has been an important means of realizing quality goals of the firm.					
There has been a strong relationship between good communication and successful quality implementation					
Total quality management has depended on communication that flows in all directions up, down and laterally.					
Communication between all levels in the organization is vital.					

8. To what extent has your firm implemented the following Training TQM practice? (Please tick appropriately)

Training Drivers	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
Training has been absolutely vital to the success of TQM.					
The firm conducts awareness training for teams of top level managers, mid-level managers, and non-managers.					
Training has provided an opportunity to inform employees about the firm's goal of TQM.					
Training has provided workers with the skills and knowledge					

needed to achieve firm's TQM goals.					
The firm has additional skills' training for successful TQM implementation					
Training has provided an opportunity to empower and motivate employees					

9. To what extent has your firm implemented the following Rewards and Recognition TQM practice? (Please tick appropriately)

Rewards and Recognition Drivers	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
An appropriate system of recognition and reward has been crucial to the organization's TQM programme.					
Positive reinforcement through recognition and reward has helped the firm to achieve its quality go					
People work for achievement, advancement, increased responsibility, recognition, job interest as well as money					
Managers always look for positive behavior to recognize and reward, rather than negative conduct to criticize.					
Managers give recognition and reward publicly to maximize their impact and effectiveness.					
Managers have a wide-range of recognition and reward options to match the ability of individual(s) involved.					



10. To what extent has your firm implemented the following Standards and Measures TQM practice? (Please tick appropriately)

Standards and Measures Drivers	Very Great Extent	Great Extent	Moderately	Small Extent	Very Small Extent
Measurement has allowed the organization to initiate corrective action					
Measurement has allowed the organization in setting priorities					
Measurement has allowed the organization to evaluate progress					
Standards and measures have helped the firm in reflecting customer requirements, preferences and changes.					

**Section C: Performance Improvement: Data for last three year**

Performance Indicator	Unit of Measure	2012	2013	2014
Quantity of defective units	Parts Per Million			
Total quantity of units supplied	Parts Per Million			
Value of raw material	Kenya Shillings			
Work-in-progress(WIP)	Numbers			
Equipment Availability	Percentage			
Equipment Performance	Percentage			
Equipment Quality	Percentage			
Number of good units made	Numbers			

Number of direct operator hours	Hours			
Sales Turnover of Model Area	Kenya Shillings			
Square meters of Model Area	Square Meters			
Number of planned deliveries	Percentage			
Number of not-on-time deliveries	Percentage			
Number of incorrect quantity deliveries	Percentage			
Employee Output Value	Kenya Shillings			
Employee Input Value	Kenya Shillings			
Number of employees	Numbers			

*Thank you for taking your time to complete the questionnaire*

**APPENDIX II: LIST OF PHARMACEUTICAL  
MANUFACTURING AND DISTRIBUTING FIRMS IN KENYA**

1. African Cotton Industries Limited
2. Alpha Medical Manufacturers Limited
3. Beta Healthcare International Limited
4. Biodeal Laboratories Limited
5. Bulk Medicals Limited
6. Cosmos Limited
7. Dawa Limited
8. Elys Chemicals Industries Limited
9. Gesto Pharmaceuticals Limited
10. GlaxoSmithKline Kenya Limited
11. KAM Pharmacy Limited
12. Laboratory & Allied Limited
13. Manhar Brothers (K) Limited
14. Medivet Products Limited
15. Novelty Manufacturing Limited
16. Pharm Access Africa Limited
17. Pharmaceutical Manufacturing Co (K) Limited
18. Regal Pharmaceuticals
19. Revital Healthcare (EPZ) K
20. Universal Corporation Limited
21. Alpha Medical Manufacturers
22. Aventis Pasteur SA East Africa
23. Bayer East Africa Limited
24. Beta Healthcare (Shelys Pharmaceuticals)
25. Cosmos Limited
26. Dawa Pharmaceuticals Limited
27. Didy Pharmaceutical
28. Diversey Lever
29. Eli Lilly (Suisse) SA
30. Elys Chemical Industries Limited

31. GlaxoSmithKline
32. High Chem East Africa Limited
33. Ivey Aqua EPZ Limited Athi River
34. Mac's Pharmaceutical Limited
35. Manhar Brothers (Kenya) Limited
36. Novartis Rhone Poulenc Limited
37. Novelty Manufacturers Limited
38. Pfizer Corp (Agency)
39. Pharmaceutical Manufacturing Co (K) Limited
40. Pharmaceutical Products Limited
41. Phillips Pharmaceuticals Limited
42. Regal Pharmaceutical Limited
43. Universal Pharmaceutical Limited
44. Biodeal Laboratories
- 45 Bulk Medicals Limited
46. Dawa Limited
48. Galaxy Pharmaceuticals Limited
49. Infusion Kenya Limited
50. Kam Pharmacy Limited
51. Laboratory & Allied Limited
52. Mac's Pharmaceutical
53. Medisel-K Ltd
54. Nor brook Kenya
55. Piochem Ltd
56. Sphinx Pharmaceuticals
57. Twiga Chemical Industries
58. Oss-chemie Kenya limited.
59. Njimia Kenya Limited.
60. Mira Kenya Limited