

**QUALITY MANAGEMENT PRACTICES AND SUPPLY
CHAIN PERFORMANCE OF LARGE SCALE
MANUFACTURING FIRMS IN KENYA**

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DECLARATION

This research project is my original work and has not been presented to any other institution. No section of this project may be reproduced or transmitted in any form or by any means, without permission from the author or that of the University of Nairobi.

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D61/67575/2013

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DEDICATION

I dedicate this research project to my husband Alfred Musungu, my children Iman and Azzam, my mother Amina Ali, my sister Zubeda and my best friends Linah Ouru and Juliet Makali for all the support they gave me.

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I thank the Almighty God for enabling me to do my research and complete it in time.

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LIST OF ABBREVIATIONS AND ACRONYMS

EPZ Export Processing Zones

GDC Geothermal Development Company

KAM Kenya Association of Manufacturers

KPI Key Performance Indicators

QFD Quality Function Deployment

SCM Supply Chain Management

SME Small and Medium Enterprises

TQM-Total Quality Management

WMP World Manufacturing Production

ABSTRACT

This study was set to establish quality management practices and supply chain performance in large manufacturing firms in Nairobi, Kenya. The study had three objectives: to determine the extent to which quality management practices are implemented by large scale manufacturing firms in Kenya, to establish the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Kenya and to determine the challenges of implementing quality management practices faced by large scale manufacturing firms in Kenya. The study used a descriptive research design to collect data and descriptive statistics was used to analyze the data. The study established that that the quality management practices (continuous quality improvement, six sigma practice, lean operations/production, international organization for standardization, benchmarking and supplier partnering) have been practiced to a large extent by the large manufacturing firms in Nairobi, Kenya. Also the study found that there is a positive relationship between dependent variable (supply chain performance) and independent variables. In accordance with the third objective, the study found out that the most seriously faced challenges were: numerous layers in management levels leading to duplication of duties which the respondents reported they were facing to a great extent, top management lack of commitment on quality implementation, competition at the expense of implementation, cultural dynamism and poor leadership by top management hinder quality management implementation were faced by respective organizations at moderate extent while inadequate resources for implementing quality management practices and lack of effective and adequate training on quality control were faced by the respective organizations at low extent. However, there were limitations in the study. For instance, the data collection was collected by Likert scale questionnaires, which have a degree of biases in their responses. Some firms identified also did not participate, citing lack of time and privacy issues. The study recommends further research to be conducted on how quality management practices affect performance of firms in the services industry as well as other types of organizations such as wholesalers and retailers.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

To succeed in today's environment, managers need to integrate their goals effectively to compete in the dynamic, global economy and focus on the final customer as the driver for improvements. According to Lakhal, Pasin and Limam (2006), supply chains compete based upon cost, quality, time and responsiveness. Supply chain improvement tools include, but are not limited to process improvement tools of flow charting, flow diagrams, service blueprints, process analysis, process re-engineering, link charts, multi-activity analysis, backward chaining, and Gantt charts.

Globally, manufacturing firms apply quality management practices mainly for meeting customers' satisfaction. However, supply chain management is seen as a way of improving competitive performance through integrating internal functions of a firm with the external operations of the suppliers, customers and other members of the supply chain network (Lee and Kincaid, 2003). This might lead to changes in the traditional structure of the organization. Supply chain management has shifted focus to coordination and configuration of processes that are essential in manufacturing of products in time and ensuring quality products and service delivery to customers.

Li, Ragu-Nathan and Rao (2005) argues that quality management practices and supply chain management (SCM) have been recognized as the two key strategies for manufacturing and service firms; and have become a prerequisite for success in the international market. Quality management practices and supply chain act as essential tools to achieve competitiveness and enhancing organizational performance.

Al-Marri, Ahmed and Zairi (2007) stated that "proper implementation of quality

management practices ensure that processes and procedures are followed to ensure customers' satisfaction". Lee and Kincade (2003) notes that most manufacturing firms faces problems in implementation of quality management practices, this is attributable to poor leadership in all the sectors especially within the supply chain network, culture is also a challenge due lack of willingness to learn and implement quality management. Bayazit (2003) argue that lack of modern facilities and technology to effectively implement quality management delays the production process and prolongs delivery of goods and services to the final consumer.

1.1.1 Quality Management Practices

Quality management can be viewed as a management approach made of its principles, practices and techniques (Dean & Bowen, 1994). The principles are a set of fundamental assumptions that explain how the firm is viewed together with its relations to customers, competitors and suppliers. The practices are seen as the activities performed to show and symbolize the principles, such as collecting customer information, improving work processes and managing employees. The techniques are viewed as the procedures and infrastructure for conducting certain practices (Dean & Bowen, 1994).

Quality management practices have been investigated extensively by various researchers (Kaynak, 2003). Although a plethora of practices have been described, similarities among practices can be discerned. The distinct generic practices proposed in quality management literature are: top management commitment and support, organization for quality, employee training, employee participation, supplier quality management, customer focus, continuous support, improvement of quality system, information and analysis and use of statistical techniques (Kaynak, 2003). Although a

plethora of practices have been described, similarities among practices can be discerned. The distinct generic practices proposed in a large set of articles are: top management commitment and support, organization for quality, employee training, employee participation, supplier quality management, customer focus, continuous support, improvement of quality system, information and analysis, and statistical quality techniques use (Magutu, Mbeche, Nyaoga, Nyamwange Nyaanga and Ogoro, 2010).

Yang (2006), quality management practices including quality management, process management, employee empowerment and teamwork, customer satisfaction management, quality goal setting and measurement supplier's cooperation and quality tools training have positive effects on customer satisfaction and that the adoption of QM principles is an effective means by which companies can gain competitive advantage. The implementation of the QM practices also helped companies to improve their image, employee's satisfaction and quality awareness. Quality management practices in the supply chain are critical for maintaining a competitive edge in the marketplace and reducing operating costs ((Mohamed et al., 2008). Implementation of quality management practices result in reduced set up time, allowing improved schedule attainment and correspondingly faster response to market demands (Flynn and Flynn, 2005). This helps in synchronizing, to a greater extent, the whole supply chain (Tutuncu and Kucukusta, 2008).

Quality management practices are key ingredients in achieving quality services to customers, some of the quality management practices used by manufacturing firms are: continuous improvement, benchmarking, supplier partnering, International Organization for Standardization (ISO), Six Sigma, 'Poka Yoke' and Quality awards.

Implementation of quality management practices enables companies to improve their internal operations in an efficient manner; this is however considered a requirement to become competitive in the global market place. Total quality management is an organizational wide process which requires changes both in production and decision making processes, employee training and development, participation as well as involvement (Jung and Wang, 2006).

1.1.2 Supply Chain Performance

Gunasekaran and McGaughey (2004) defined supply chain performance as the entire chain's ability to meet end-customer needs through product availability and responsiveness on-time delivery. Supply chain performance entails both functional lines and company boundaries. Improving supply chain performance is a continuous process that requires both an analytical performance measurement system and a mechanism to initiate steps for realizing key performance indicators (KPI) goals.

Cai and Zhihui (2008) indicated that the mechanism to achieve key performance indicators goals is referred as key performance indicators accomplishment; it connects planning, and execution, and builds steps for realization of performance goals into routine daily work. When measuring supply chain performance, there are a set of variables that capture the impact of actual working of supply chains on revenues and costs of the whole system. These variables as drivers of supply chain performance are derived from supply chain management practices for example supply chain planning, supplier selection and integration (Taticchi and Brun, 2010).

Stewart (2005) indicates that in measuring supply chain performance, there are a set of variables that capture the impact of actual working of supply chains on revenues

and costs of the whole system. These variables are drivers of supply chain performance and are always derived from supply chain management practices (Gunasekaran and McGaughey, 2004). Managers of an organization have to achieve an improvement in their supply chains. This is achieved through continuous planning, monitoring and execution.

1.1.3 Quality Management Practices and Supply Chain Performance

Casadesus and de Castro (2005) contends that implementation of quality management practices helps reduce process variance, which has a direct impact on supply chain performance measures, such as cycle time and delivery dependability. Quality management practices result in set-up time reduction, allowing improved schedule attainment and correspondingly faster response to market demands. This helps in synchronizing, to a greater extent, the whole supply chain.

According to Zhang, Chang and Yu (2006), implementation of quality management practices requires that processes are followed and customers are satisfied. Supply chain management includes a set of approaches and practices to effectively integrate suppliers, manufacturers, distributors and customers for improving the long-term performance of the individual organization and the supply chain as a whole in a cohesive and high-performing business model (Chandra and Kumar, 2000).

Proper implementation of quality management practices leads to fewer defects; the amount of inventory in the supply chain is reduced. Supply chain members move only 'good' units, and not 'defective' units through the supply chain. Quality management practices reduce process variance, which has a direct impact on supply chain

performance measures, such as inventory and time measures (Chen and Paulraj, 2004).

Burt, Dobler and Starling (2003) argue that quality is an important factor for companies in their relationship between suppliers and customers. Positive relationships between quality management and supply chain management exist. Quality management improvements in reducing process variation directly impact on several supply chain performance measures. Flynn and Flynn (2005) claimed that with continuous quality management improvement, defects, process and production variation, are reduced. As consistency in the supply chain improves due to the variation reduction, cycle times are reduced the time between two successive replenishments and on-time delivery improves.

1.1.4 Large Manufacturing Firms in Kenya

Ngui (2008) indicates that the economic recovery strategy for employment and wealth creation report, the manufacturing sector in Kenya is a major source of growth, still with high potential for growth and investment. The role of the manufacturing sector in Vision 2030 is to create employment and wealth. Manufacturing sector makes an important contribution to the Kenyan economy and currently employs 254,000 people, which represents 13% of total employment with an additional 1.4 million people employed in the informal side of the industry. With reference to World Manufacturing Production (2014), there are over 1000 manufacturing firms in Kenya, this sector is mainly agro-based and characterized by relatively low value addition, employment, and capacity utilization and export volumes partly due to weak linkages to other sectors The intermediate and capital goods industries are also relatively

underdeveloped, implying that Kenya's manufacturing sector is highly import dependent.

A large manufacturing firm is an organization whose startup capital is more than \$500Mn, with more than 500 employees and makes a profit of more than \$1000 Mn. These firms manufacture and produces and goods in large quantities. Bolo and Wainaina (2011) noted that large manufacturing firms would be expected to have a lower cost per unit of output than a smaller facility, all other factors being equal, while a company with many facilities should have a cost advantage over a competitor with fewer. KAM (2014), the firms differ in terms of products that they are engaged in and in size as determined by the number of employees. The manufacturing industry has the potential to generate foreign exchange earnings through exports to diversify the country's economy and create employment.

According to Kenya Association of Manufacturers (2014), there are 455 large manufacturing firms in Nairobi, Kenya as provided in Appendix II. The function of Kenya association of manufacturers is to ensure a competitive local manufacturing in a liberalized market. This cannot be achieved without proper quality management. Top management of large manufacturing firms should commit themselves in implementing quality management practices through employee training, employee involvement, supplier quality management, customer focus, quality system improvement and statistical techniques. This leads to an efficient supply chain management system that is cost effective for the delivery of value added goods and services to the firm.

1.2 Statement of the Problem

With reference to Behara and Gundersen (2001), quality management is a key ingredient towards achieving supply chain performance. Today's marketplace is shifting from individual company performance to supply chain performance. The entire chain's ability to meet end-customer needs through product availability and responsive, on-time delivery is critical for the firm's performance. Chen and Paulraj (2004) argue that to realize this goal, implementation of quality management practices is significant in achieving supply chain efficiency through improved speed and cutting costs to deliver quality goods and services that meet customer needs.

Large scale manufacturing firms will be the main focus of this study, this is because according to Anupindi et al., (2004) they manufacture, produce and distribute the highest volumes of goods and services compared to medium and small scale firms and most customers heavily rely on them for quality goods and services. Bolo and Wainaina (2011) argue that to serve the growing needs of customers, implementation of quality management practices is an essential component to large scale manufacturing firms in order to minimize of costs of production, improve efficiency in their supply chain and thus deliver value adding goods and services to improve customer satisfaction.

Studies by Kuei et al. (2001) and Flynn and Flynn (2005) in their studies found that there was a positive correlation between quality management and supply chain performance in service firms. Bayazit (2003) found that quality management practices were key ingredients in achieving an efficient supply chain of manufacturing firms in Turkey. These studies did not address the relationship between quality management practices and supply chain performance of manufacturing firms in Kenya.

Njuguna (2013) and Mutua (2014) found that there was a positive relationship between quality management and performance in the manufacturing industry. Ngina (2014) found, lack of modern technology, resistance to change, top management commitment and organizational culture were the main challenges towards implementation of quality management practices in GDC. These studies did not address matters in relation to quality management practices and supply chain performance in large scale manufacturing firms. This study sought to determine the quality management practices used by large scale manufacturing firms in Kenya by answering the following questions: what is the extent to which quality management practices are implemented in large scale manufacturing firms in Kenya? What is the relationship between quality management practices and supply chain performance in large manufacturing firms in Kenya? And what are the challenges of implementing quality management practices faced by large scale manufacturing firms in Kenya

1.3 Objectives of the Study

- i. To determine the extent to which quality management practices are implemented by large scale manufacturing firms in Kenya.
- ii. To establish the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Kenya.
- iii. To determine the challenges of implementing quality management practices faced by large scale manufacturing firms in Kenya.

1.4 Value of the Study

The findings of this study hopes to provide manufacturing firms with an exploration approach and having a better understanding in the applicability of quality management practices and the challenges of implementing quality management

practices.

Kenya Association of Manufacturers and other policy makers will also benefit from the findings of this study since it will inform policy setting that ensure that manufacturing firms comply with quality management practices in Kenya.

Other firms: may stand to benefit from the findings of this study since it will provide more knowledge on how effective quality management practices enhance supply chain performance of firms to achieve customer satisfaction.

In theory, researchers and academicians can use the findings herein to generate ideas for further studies in their areas of study. They can use the findings of this study to make comparisons to arrive to a logical conclusion.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section provides a review of quality management principles, quality management practices, supply chain performance, the determinants of supply chain performance, summary of the literature review, knowledge gap and the conceptual framework.

2.2 Quality Management Principles

Strategic quality management factors, as they have been detected in recent studies are: leadership, strategic quality planning, employee management and involvement, supplier management, customer focus, process management, continuous improvement, information and analysis and knowledge and education. Factors such as top management commitment and leadership, people management, policy and strategy, partnership and resources management and management of processes, are generally considered as the initial inputs to the implementation of total quality management. European Foundation for Quality Management (1999), called these factors enablers.

Leadership and Top Management Commitment: The increased awareness of senior executives, who have recognized that quality is an important strategic issue, is reflected as an important focus for all levels of the organization (Oakland, 2000). This requires defining and implementing several quality factors which include top management commitment and involvement, employee empowerment and culture. These factors are known by some writers as the soft aspects of management, while the hard aspects include factors such as improvement tools and techniques and systems

(Oakland, 2000). Promoting organizational commitment is achieved as a result of top management commitment.

Customer Focus: Deming's approach to quality diverged from other quality perspectives, like Juran (Juran and Godfrey, 1998) and ISO 9000 (Hoyle, 2005), which both subscribe to the approach that inherent characteristics define quality. Indeed, earlier versions of ISO 9000 were criticized as a type of closed system that could not account for customer satisfaction. An example of the importance of this omission is the Firestone/Bridgestone tire debacle. Even though Firestone was ISO 9000 certified, defects in their tires caused a number of accidents and even deaths. Critics maintained that if the ISO 9000 process had a venue for customer satisfaction indicators, including customer complaints, the company might have been able to resolve the defect problems early on with minimal injury (Daniels, 2000).

Employee Management: The revised (April 1999) EFQM model of excellence emphasizes on the consideration of culture and employee motivation in terms of delivering organizational outcomes. Middle management have a particular role to play, since they must not only grasp the principles of strategic quality management but they must go on to explain them to the people for whom they are responsible, and ensure that their commitment is communicated (Oakland, 2000).

Training and Education: Training underpins quality management and determines the effectiveness of the quality initiatives undertaken. Deros et al., (2006) noted that human resource development is one of the critical success factors in benchmarking practice which will drive in improving business and management process.

Supplier Management: Supplier quality management is an important aspect of strategic quality management since materials and purchased parts are often a major source of quality problems. Many authors advocate that companies must establish

supply chain partnerships to motivate suppliers to provide materials needed to meet customer expectations .Effective supplier quality management is facilitated by a corporative relationship with suppliers (Thiagarajan et al., 2001).

2.3 Quality Management Practices

According to the American Society for Quality, quality management practices ensure that customers requirements such as confidence in the ability of the organization to deliver the desired product and service consistently meeting their needs and expectations. The practices seek to ensure that organization's requirements are met both internally and externally, and at an optimum cost with efficient use of the available resources – materials, human, technology and information. The success of a program depends on how well a specific improvement program is implemented and integrated with the overall business strategies. Firms that adopt a program because of peer pressure or just as a marketing tool are less likely to succeed than firms that view these programs as useful development tools. Service champions make best practices in service quality a core part of their organization culture (Kotler, 2010).

Quality management practices are:

Continuous Quality Improvement (CQI) is a quality management practice that came into existence in manufacturing as a different approach to quality and quality systems. The American Society for Quality describes the practice as an ongoing effort to improve products, services or processes. These efforts seek incremental improvement over time or breakthrough improvement all at once. It does not focus as much on creating a corporate quality culture, but more on the process of quality improvement. CQI implementation attempts to develop a quality system that is never satisfied; it strives for constant innovation to improve work processes and systems by reducing

time-consuming, low value-added activities. Summers(2000) defines continuous improvement as a philosophy that focuses on improving processes to enable companies give customers what they want the first time, every time. Summers continues to assert that this customer focused, process oriented approach to doing business results to increased satisfaction and delight for both customers and employees.

The Six sigma practice was developed at Motorola in the 1980s as a method to measure and improve high-volume production processes. Its overall goal was to measure and eliminate waste by attempting to achieve near perfect results. The term six sigma refers to a statistical measure with no more than 3.4 defects per million. It is a disciplined, data-driven approach and methodology for eliminating defects (driving toward six standard deviations between the mean and the nearest specification limit) in any process from manufacturing to transactional and from product to service (Pyzdek and Keller, 2010). Six Sigma is a quality management tool used by manufacturing firms; it is a defect reduction program that was pioneered by General Electric's Jack Welch. This tool plays an important in elimination of waste and increasing efficiency. It addition, it helps in mitigating frequency of errors that may be caused by inconsistencies and inefficiencies when the manufacturing firms are carrying out their activities. For instance the application of Six Sigma prevents the firm from incurring stock out costs and obsolete stock (Davenport, Jerry and Tang, 2006). Quality award is a quality control practice that motivates manufacturing firms to observe quality standards and procedures when carrying out their work within and outside the firm (Henricks, 2006).

International Organization for Standardization practice is another quality management practice. ISO quality standards involve standardization of processes. This practice that

is now being adopted by many organizations such as the adoption of the single quality standard ISO 9000 which is the only standard of quality with international recognition (Heizer and Render 2008). The series of standards, define, establish, and maintain a quality assurance system for manufacturing and service industries. The standard covers all aspects of an organization's activities, including: identifying its key processes, defining roles and responsibilities, its policies & objectives, and documentation requirements. It also covers the importance of understanding & meeting customer requirements, communication, resource requirements, training, product & process planning, design processes, purchasing, production & service, monitoring and measurement of products & processes, customer satisfaction, internal audit, management review, and improvement processes (Hoyle, 2006).

Lean Operations/Production is a quality management practice originating in the Toyota Corporation. Lean's main philosophy is to concentrate time and effort on identifying and refining steps in an operation that the customer deems valuable, and to eliminate wasteful or unnecessary steps in a process (Lee, Olson, Lee, Hwang, & Shin 2007). The program relies heavily on the observation of processes by management, as well as the importance of clean and efficient work spaces. The Lean way to determine value is whether or not customers will pay for that step in the process (Irani, 2011). For example, a clean hotel room is something that a customer may hold valuable. Along the process of cleaning and preparing a hotel room, steps occur that the customer may not perceive as valuable. It is the goal of lean to eliminate the steps that the customer is not willing to pay for, and at the same time can be eliminated from the process without affecting the end product or service. JIT or Just-in-Time is focused on rapid throughput as well as reducing inventory to provide improvements on

operations. JIT provides lean operations that supply or receive only the materials needed, only at the time they are needed (Heizer & Render, 2009).

Benchmarking is another quality management practice which involves an organization continuously comparing and measuring itself against business leaders anywhere in the world to gain information and provide a guideline for rational performance goals (Agus, 2008). Benchmarking is a continuing process of measuring products, services, and practices against your strongest competitors. In benchmarking, the best performing firms are used as yardsticks against the organization that is evaluating itself (Caringo and Maria, 2006). There are two types of benchmarking used by manufacturing firms use to assess quality. The first, competitive benchmarking involves benchmarking against direct competitors in the marketplace (Wright and Richard, 2007). This can include comparing specific numerical or statistical measurements return on assets used and the market share. The second method noncompetitive benchmarking, can take two forms. The first is measuring your company against the best companies in the world, regardless of industry. Companies such as 3M, Coca-Cola, and General Electric are considered to be trendsetters and leaders in quality, so companies from nearly every industry study them and copy their best practices (Wilkinson, Adrian and Hugh, 2006).

Supplier partnering is another quality management practice. Supplier partnering is increasingly common practice globally. The manufacturers work directly with their parts and components suppliers to improve quality at the supplier's location (Wilkinson, Adrian and Hugh, 2006). This can involve direct participation in the supplier's operations that is staff from the manufacturer might work on site at the supplier's office or provide technical assistance and equipment or simply a very close working relationship that more resembles a partnership rather than a simple business

transaction between two unrelated firms (Van de Vliet, 2006). One of the methods of partnering with suppliers involves sharing the use of statistical controls. Most globally manufacturers have switched to outsourcing as a means of cutting the costs of production (Songini and Marc, 2007). This increased emphasis on outsourcing means that the companies that supply the parts or components must place just as much emphasis on quality as the manufacturer if the finished product is to be of high quality. Among the quality issues that still need to be addressed in the manufacturer-supplier relationship are inconsistent quality levels from suppliers, even from different plants of the same supplier. To counter this challenge most firms especially the auto industry, manufacturers are overcoming the supplier problems by helping the suppliers meet quality standards (Prado Carlos, 2007).

2.4 Challenges of Implementing Quality Management Practices

Edwards, Roberts and Clarke (2002) points out that poor leadership is one of the challenges of implementation of quality management practices in supply chain channels of most firms. Numerous layers of management lead to duplication of duty and responsibility. Dickson (1999) explain that this has made employees in lower levels to disregard implementation of quality. As a result employees who are directly involved in the production of goods or delivery of services are not motivated enough to incorporate quality issues that have been raised by the customers they serve since they do not feel as part of the continuous process of quality improvement in the organization.

De Boer (2001) argues that most organizations that fail in implementation of quality management their top management is not visibly and explicitly committed to quality implementation in many organizations, this negatively impacts on supply chain

performance leading to low quality goods and services. Chopra and Meindl (2001) averred that adequate cultural dynamism makes total quality implementation difficult because most top level management of many organizations is rigid in their ways of doing things.

Chen and Paulraj (2004) found that inadequate resources for implementing quality management practices are a problem to most firms, Chandra and Kumar (2000) indicated that companies do not involve quality in their strategic plan; little attention is paid to quality management in terms of human and financial resources. On the other hand Casadesus and de Castro (2005) argue that more attention is drawn towards enhancing the profit margins of the firms unlike devising efficient channels that can efficiently deliver goods and services for improved customer satisfaction.

De Boer et al., (2001) maintain that lack of commitment in quality management may stem from various reasons. Major obstacles include the preoccupation with short-term profits and the limited experience and training of many executives. Lakhal et al., (2006) argue that competition alone should not be considered as the single factor that drives managers into implementing quality initiatives; the management should also aim at improving supply chain delivery speed to enhance customer satisfaction.

Mohamed et al., (2008) claim that implementation of quality management practices requires a well-educated workforce with a clear understanding of the organizational processes and procedures to appreciate the whole process of supply chain. According to Dickson (1999) implementation of quality management practices requires a well-educated workforce with a solid understanding of supply chain processes and procedures. Chopra and Meindl (2001) clarifies that although companies invest heavily in quality awareness, statistical process control, and quality circles, often the

training is too narrowly focused. Top management should take reasonable time to plan projects thoroughly and invest in supply chain partnering to develop an effective project team to facilitate free flow of materials from the organization to the final consumer.

Stanley and Wisner (2001) puts forth that lack of adequate modern technologies for example information communication technology is a major challenge in implementation of quality management practices especially in the developing economies. Trent (2001) elucidate total most companies do not involve quality in their strategic plan; little attention is paid to TQM in terms of human and financial resources. Much of the attention is drawn to increasing profit margins of the organization with little regard as to whether their offers and supply to customers are of expected quality. Dickson (1999) explain that there is paltry budgetary allocation made towards employee training and development which is critical for total quality management implementation. Noori (2004) highlighted that without an appropriate and empowering budgetary process many of the TQM objectives are difficult to realize as they lack a relevant driving mechanism. In particular, the success of teamwork and empowerment is so central to TQM is inextricably linked to the budgetary process. Thus inhibits proper quality services which may lead to poor performance of supply chain.

According to Stewart (1995) lack qualified and experienced staff has always been a challenge in upcoming sectors but with proper training, motivation and the right attitude this is solved. Ngina (2014) noted that in developing economies like Kenya, implementation of quality management practices is a challenge due to lack of qualified and experienced employees in quality management and supply chain management, this pose a challenge to most organizations making it difficult for them

to provide effective quality services for improved supply chain performance. Kirk and Rice (2000) indicate that qualified employees play a critical role in implementation of quality management practices since they understand the processes and procedures required in implementation of quality practices.

2.5 Summary of the Literature Review and Knowledge Gap

The empirical review shows that quality management is essential in achieving supply chain performance. Studies by Kuei et al. (2001); Flynn and Flynn (2005) and Bayazit (2003) found that quality management practices play a pivotal role in improving supply chain performance to serve the increasing needs of customers and grow the market share of the organization. These studies did not investigate on the effect of quality management practices and supply chain performance of scale manufacturing firms in Kenya. This study therefore seeks to fill this gap by addressing the research question: what is the relationship between quality management practices and supply chain performance of large manufacturing firms in Kenya.

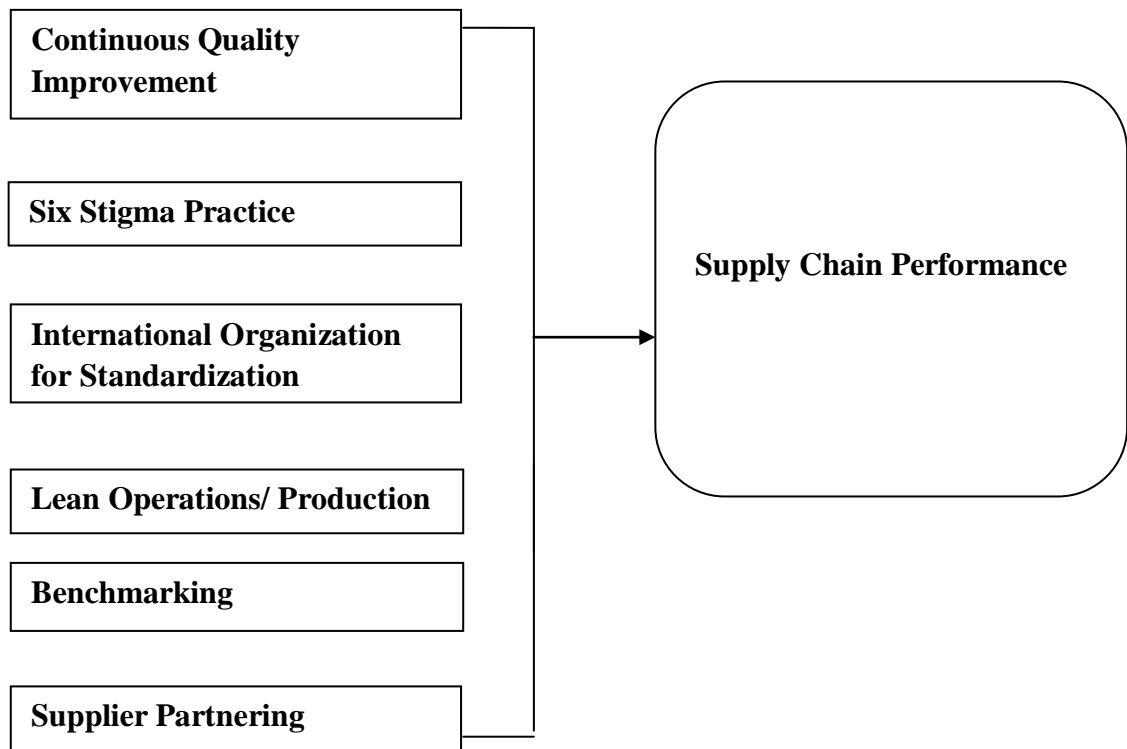
2.5 Conceptual Framework

The researcher used a conceptual model below to explain the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Nairobi, Kenya. It is hypothesized that the independent variables influence the dependent variable which is supply chain performance of large scale manufacturing firms in Kenya. Below is the conceptual framework.

Figure 2.1

Independent Variables

Dependent Variable



Source: (Author, 2015)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter gives an outline of the research design, the target population, sampling design, data collection instruments and procedures, and the techniques for data analysis.

3.2 Research Design

A descriptive survey was used for this study. With this study, information was obtained to meet the underlying purposes and objectives of the study. Descriptive survey was useful in investigating the existing relationships among the variables that was captured in this study. According to Cooper & Schindler (2003), a survey is feasible when the population is small and variable hence the researcher was able to cover all the elements of the population. Hence the survey was considered to be more efficient and economical.

3.3 Population of the Study

The population of this study consisted of all large scale manufacturing firms in Nairobi, Kenya. With reference to the Kenya Association of Manufacturers (2014), there are 455 large scale manufacturing firms in Nairobi, Kenya as provided in Appendix II. The study considered Nairobi because this is where most of the large scale manufacturing firms in various sectors are concentrated.

3.4 Sample Design

The study used a stratified sampling approach to determine the sample of the study provided in Appendix II. Stratified sampling was used because each of the

manufacturing firms is classified according to their sectors. The sample was drawn from the population of 455 large scale manufacturing firms calculated at 95% confidence level. The study used a sample size of 46 large scale manufacturing firms (Makori, 2014).

3.5 Data Collection

The study used both primary and secondary data that was collected through a structured questionnaire designed to elicit specific responses for qualitative and quantitative analysis respectively. Secondary data was obtained from audited financial statements of large scale manufacturing firms in Kenya. The structured questionnaires had four sections. The first part contained the general organizational information. The second part of the questionnaire contained questions on the first objective of the study which was to determine the extent to which quality management practices are implemented by large scale manufacturing firms in Kenya. The third part of the questionnaire contained questions on the second objective of the study which was to establish the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Kenya. The fourth part of the questionnaire contained questions on the third objective of the study which was to determine the challenges of implementing quality management practices faced by large scale manufacturing firms in Kenya.

The respondents chosen for this study were the heads of purchasing or procurement in the supply chain department and the management officers in charge of quality supply chain management or their equivalents. This category of the respondents was chosen because they are deemed to understand the process of implementation of quality management practices and its impact on supply chain performance of large scale

manufacturing firms. The structured questionnaires was administered using the “drop and pick later” method at an agreed time with the researcher.

3.6 Data Analysis

Data relating to the first objective of this study, which was to determine the extent to which quality management practices are implemented by large scale manufacturing firms in Kenya, was analyzed using descriptive statistics. Data relating to the second objective of the study, which was to establish the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Kenya, was analyzed using regression analysis. Data for the third objective, which was to determine the challenges faced by large scale manufacturing firms in Kenya in implementing quality management practices, was analyzed using descriptive statistics. The regression model was used to establish the relationship between quality management practices and supply chain performance of large scale manufacturing firms in Kenya. The regression adopted consisted five variables: The independent variables: quality management practices while the dependent variable is supply chain performance of large scale manufacturing firms. Below is the regression model adopted for data analysis.

$$Y=a + b_1 X_1 +b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6X_6 + e$$

Where:

Y is Supply Chain performance

a is the Y intercept when x is zero

b1, b2, b3, b4, b5 and b6 are regression weights attached to the variables

$X_1 \dots X_n$ are the coefficients

X_1 = Continuous Quality Improvement

X_2 = Six Sigma Practice

X_3 = International Organization for Standardization

X_4 = Lean Operation/Production

X_5 = Benchmarking

X_6 = Supplier Partnering

e= Error term.

The table below gives a summary of data collection and data analysis methods.

Table 3.1

Objectives	Questionnaire	Data Analysis
General Profile	Section A	Descriptive
Objective 1	Section B	Descriptive
Objective 2	Section C	Regression
Objective 3	Section D	Descriptive

Source: (Author, 2015)

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter discusses the findings of the study. This study was carried out to establish the relationship between quality management practices and supply chain performance in large manufacturing firms in Nairobi, Kenya. The main units of measure used to present the findings are percentages, frequency distributions, mean and standard deviation. A total of 46 questionnaires were issued out and 40 were returned. This represented a response rate of 85%. Therefore, the data is adequate for the study.

4.2 General Information

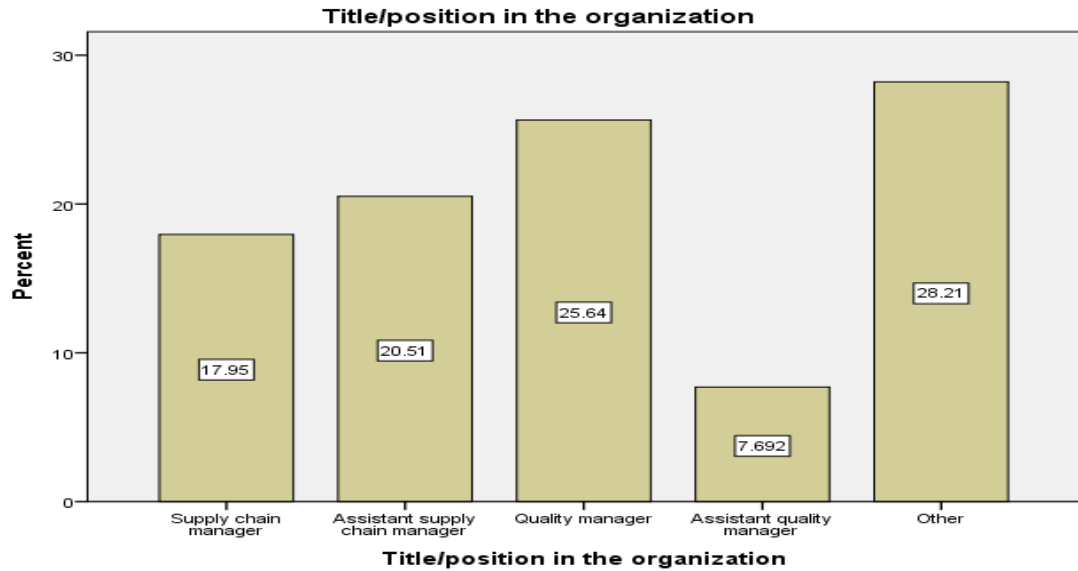
The general information considered in this study was one's current position in the organization, the duration worked in the position, the duration worked for the organization, the duration the organization has been in operation and the number of permanent employees.

4.2.1 Respondents Current Position in the Organization

The respondents were asked to indicate their current position/title in the organization. The results in figure 4.1 indicate that 17.95% of the respondents indicated they were supply chain managers, 20.51% of the respondents indicated they were assistant supply chain managers, 25.64% of the respondents were quality managers, 7.69% of the respondents were assistant quality managers and 28.21% of the respondents were in the category of others (accountants, general managers, operations managers, production engineers and purchasing officers). Therefore, 70% of the respondents

were directly engaged in activities related to quality management and supply chain management in their respective organizations hence an assurance that required information was obtained.

Figure 4.1: Respondents Current Position in the Organization



Source: Research Data, 2015

4.2.2 Duration Worked in the Current Position

The respondents were asked to indicate the duration they have worked in their current position in their respective organizations. Results in Figure 4.2 show that 45% of the respondents have worked in their current position for less than 5 years, 37.5% of the respondents have worked in their current position between 5 – 10 years, 10% of the respondents have worked in their current position between 11 – 15 years and 7.5 % have worked in their current position above 15 years. The results indicate that 55% of the respondents have been working in their current position for more than 5 years hence an indication they have a higher understanding on quality management practices in their respective organization.

Figure 4.2: Duration Worked in the Current Position



Source: Research Data, 2015

4.2.3 Respondents Duration worked in the Organization

Table 4.1: Respondents Duration worked in the Organization

	Frequency	Percentage	Cumulative Percentage
Less than 5 years	18	45.0	45.0
5 - 10 years	13	32.5	77.5
11 - 15 years	4	10.0	87.5
Above 15 years	5	12.5	100.0
Total	40	100.0	

Source: Research Data, 2015

Results in Table 4.1 show that 45% of respondents have worked for the organization for less than 5 years, 32.5% of the respondents have worked in the organization between 5 – 10 years and 10% of the respondents have worked in the organization between 11 – 15 years. Similarly, 12.5% of the respondents have been working in the organization for above 15 years. The results indicate that 55% of the respondents have

been working in the organization above 5 years hence, an indication that they have a clear understanding on quality management practices.

4.2.4 Duration the Organization has been in Operation

Table 4.2: Duration the Organization has been in Operation

	Frequency	Percentage	Cumulative Percentage
More than 10 years	38	95.0	100.0
Missing	2	5.0	
Total	40	100.0	

Source: Research Data, 2015

Results in Table 4.2 shows that 95% of respondents indicate that their respective organizations have in operation for more than 10 years while 5% of the respondents did not indicate the duration. Thus, the findings indicate the organizations have a wide understanding on quality management.

4.2.5 Number of Permanent Employees

Table 4.3: Number of Permanent Employees

	Frequency	Percentage	Cumulative Percentage
2 – 35	3	7.5	7.9
36 – 69	14	35.0	44.7
70 – 103	8	20.0	65.8
Above 103	13	32.5	100.0
Total	38	95.0	
Missing	2	5.0	
Total	40	100.0	

Source: Research Data, 2015

Results in Table 4.3 indicate that 7.5% of the respondents indicated that their respective organizations has between 2 – 35 permanent employees, 35% of the

respondents' respective organizations has between 36 – 69 permanent employees, 20% of the respondents' respective organizations has between 70 – 103 permanent employees and 32.5% of the respondents' respective organizations has above 103 permanent employee. 5% of the respondents did not indicate the number of permanent employees in the respective organizations. The majority of the respondents indicated that they have more than 35 employees thus indicating the respective organizations have a wider area of operations.

4.3 Extent to which Quality Management Practices are implemented

The first objective of the study was to determine the extent to which quality management practices are implemented in large manufacturing firms in Nairobi, Kenya. Quality management practices includes: continuous quality improvement, six sigma practice, international organizational for standardization, lean operation/production, benchmarking and supplier partnering.

The respondents were requested to indicate the extent to which the practices are practiced in their respective organizations in a five point Likert scale. The range was 1 = “Very small extent”, 2 = “Small extent”, 3 = “Moderate extent”, 4 = “Large extent” and 5 = “Very large extent.” The scores of “Very small extent” and “Small extent” have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous Likert scale; ($0 \leq S.E < 2.4$). The scores of “moderate extent” have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous Likert scale: ($2.5 \leq M.E. < 3.4$) and the score of both “Great extent” and “Very great extent” have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous Likert scale; ($3.5 \leq L.E. < 5.0$).

The results indicate that the quality management practices have been practiced to a

large extent by the manufacturing firms. From the data collected the respondents reported that continuous quality improvement is practiced between a very large extent and moderate extent. Most activities in continuous quality improvement are practiced to a large extent (improving processes to give customers what they want first, effective and efficient supply chain channels, constant innovation to improve work processes and organization focuses more on quality improvement.) this is shown by a mean score of 4.0769, 3.9500, 3.9000 and 3.7000. Only one activity is practiced to a moderate extent. This is shown by a mean score of 3.2632. All activities show that six sigma practices have been adopted in the respective organizations at large extent (positive image to customers on quality goods, measures and eliminates wastes, elimination of waste and increasing efficiency, measure and improves high volume production processes and disciplined, data-driven approach for eliminating defects) with a mean score of 3.9250, 3.8000, 3.6500, 3.6250 and 3.5750 respectively. All activities show that international organization for standardization show that it has been adopted by respective organizations at a large extent. This is shown by a mean between 3.8 and 3.6. All activities in lean operations/production show that it has been implemented to a large extent. This is shown by a mean between 3.9 and 3.5. Most of the activities in benchmarking show that it has been implemented by respective organizations at a large and moderate extent. This is shown by a mean between 3.6 and 3.3. Similarly, all the activities in supplier partnering show that it has been implemented by respective organizations at a large extent. This is shown by a mean of 3.7 to 3.5.

Table 4.4: Extent to which Quality Management Practices are implemented

Practices	Mean	Std. Deviation
Continuous quality improvement		
Improving processes to give customers what they want first	4.0769	.80735
Effective and efficient supply chain channels	3.9500	.84580
Constant innovation to improve work processes	3.9000	.49614
Organization focuses more on quality improvement	3.7000	.72324
Organization develop quality system that is never satisfied	3.2632	.92076
Six sigma practice		
Positive image to customers on quality goods	3.9250	.79703
Measures and eliminates wastes	3.8000	.93918
Elimination of waste and increasing efficiency	3.6500	.83359
Measure and improves high volume production processes	3.6250	.89693
Disciplined, data-driven approach for eliminating defects	3.5750	.93060
International organization for standardization		
Specification that sets standards for quality	3.8250	.87376
Requirements and recommendations to how management operations work	3.8000	.88289
Standards define, establish and maintain a quality assurance system	3.7500	.86972
Standards that cover all aspects of organizational activities	3.6750	.82858
Importance of understanding & meeting customer requirements	3.6500	.94868
Lean operations/production		
Importance of clean and efficient work spaces	3.9250	.85896
Time and effort to eliminate wasteful or unnecessary steps	3.7500	.74248
Determines value of lean by analyzing customer choices	3.7000	.82275
Just-in-time to focus on rapid throughput	3.6579	.93798
Eliminates those steps the customer is not willing to pay for	3.5250	1.10911
Benchmarking		
Continuous measuring products, services against strongest competitors	3.6250	.83781
Two types of benchmarking: competitive and non-competitive	3.5250	.84694
Comparison of results with competitors	3.4872	.85446
Continuous comparing and measuring itself against business leaders	3.3750	1.00480
Supplier partnering		
Works directly with suppliers to improve quality at suppliers location	3.7500	.74248
Suppliers meet quality standards	3.7250	1.01242
Organization has direct participation in the suppliers operations	3.5250	.93336
Sharing statistical controls	3.5250	1.06187

Source: Research Data, 2015

The results indicate that quality management practices have been implemented by

large manufacturing firms in Nairobi, Kenya at a large extent hence improvement in supply chain performance. This is similar with Mutua (2014), that quality management practices among cement manufacturing firms in Kenya were; International organization for standardization, continuous improvement, supplier partnering, benchmarking and six sigma. But six sigma has been implemented to a small extent. The results contradict Owiti (2014), who found that the only benchmarking as been adopted to a large extent while the other practices have been implemented to a small extent. Similarly, the findings contradict Pak (2013), findings that quality management practices practiced are leadership, strategic planning, customer focus, information and analysis, people management, process management, and supplier management.

4.4 Quality Management Practices and Supply Chain Performance

The second objective was to establish the relationship between quality management practices and supply chain performance of large manufacturing firms in Nairobi, Kenya.

4.4.1 Tests of Coefficients

Table 4.5: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.100	.124		.811	.423
Continuous quality improvement (X ₁)	.224	.079	.216	2.844	.008
Six sigma practice (X ₂)	.218	.073	.202	2.969	.006
International organization for standardization (X ₃)	.071	.065	.064	1.082	.287
Lean operations/production (X ₄)	.194	.101	.191	1.930	.062
Benchmarking (X ₅)	.160	.083	.151	1.927	.063
Supplier partnering (X ₆)	.228	.105	.237	2.170	.037

Source: Research Data, 2015

a. Dependent Variable: Supply chain performance

As per the SPSS generated table above, the regression is:

$$Y=0.100 + 0.224 X_1 + 0.218 X_2 + 0.071 X_3 + 0.194 X_4 + 0.160 X_5 + 0.228 X_6$$

The multiple linear regression model indicates that all the independent variables have positive coefficient. The regression results above reveal that there is a positive relationship between dependent variable (supply chain performance) and independent variables (continuous quality improvement, six sigma practice, lean operations/production, international organization for standardization, benchmarking and supplier partnering). From the findings, one unit change in continuous quality improvement results to 0.224 units increase in supply chain performance. One unit change in six sigma practice, results to 0.218 units increase in supply chain performance. One unit change in lean operations/production, results to 0.071 units increase in supply chain performance. One unit change in international organizational for standardization, results to 0.194 units increase in supply chain performance. One unit change in benchmarking, results to 0.160 units increase in supply chain performance. Similarly, one unit change in supplier partnering results to 0.228 units increase in supply chain performance. The significant values represented by p 3 are all < 5% (from 0.06 – 0.37) hence this implies that only three of them are the predictors used which were significant. Similarly, the sample used Z-statistic represented by t since it is more than 30. Three of the t values are > 1.96 hence only three values are significant (Continuous quality improvement, six sigma practice and supplier partnering.)

These findings are coherent with a study conducted by Hendricks and Singhal (2007) has provided evidence of an existing relationship between quality management practices and financial performance of manufacturing firms and the effectiveness of

the implementation of quality management practices. A study by Choi and Eboch (2008) found a significant direct link between quality management practices and performance of a firm. However, the study contradicts with Raja, Ahmad and Alam (2011), found out that the effect of quality management practices on financial performance cannot be directly measured due to their indirect relationship.

4.4.2 Model Summary

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.983 ^a	.965	.959	.25021

Source: Research Data, 2015

Predictors: (Constant), Supplier partnering, International organization for standardization, Six sigma practice, Continuous quality improvement, Benchmarking, Lean operations/production

From table 4.6, the coefficient of determination is 95.9%. This indicates that 95.9% of the variation in supply chain performance is explained by the variations in the independent variables (quality management practices). It represents a fairly good fit since an R-Square of 0.965 is generally accepted as the threshold for a good fit.

4.4.3 Analysis of Variance

Table 4.7: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.753	6	0.9589	15.316	.000 ^b
	Residual	2.066	33	.063		
	Total	7.819	39			

a. Dependent Variable: Supply chain performance

b. Predictors: (Constant), Supplier partnering, International organization for standardization, Six sigma practice, Continuous quality improvement, Benchmarking, Lean operations/production

The F calculated at 5% level of significance was 15.316 since F calculated is greater than the F critical (value = 2.17), this shows that the overall model was significant. The F significance value of 0.00, indicates that regression model has probability of 0% of giving wrong prediction. It can be concluded that regression model is statistically significant, hence suitable for explaining how quality management practices affects supply chain performance of firms.

4.5 Challenges of Implementing Quality Management Practices

The third objective was to determine the challenges of implementing quality management practices faced by large manufacturing firms in Nairobi, Kenya.

The study aimed at finding out the challenges faced by large manufacturing firms in Nairobi, Kenya. The respondents were requested to indicate using a five point likert scale the extent to which they consider them significant. The range was “1 = strongly disagree,” “2 = disagree,” “3 = neither agree nor disagree,” “4 = agree,” and “5 = strongly agree.”

The results in table 4.8 indicate that the most seriously faced challenges were: numerous layers in management levels leading to duplication of duties which the respondents reported they were facing to a great extent. This is shown by a mean score of 3.3684. The respondents reported also that the challenges of: top management lack of commitment on quality implementation, competition at the expense of implementation, cultural dynamism and poor leadership by top management hinder quality management implementation were faced by respective organizations at moderate extent. This was shown by mean score of 2.6923, 2.5897, 2.5500 and 2.5000 respectively while the respondents reported that the challenge of

inadequate resources for implementing quality management practices and lack of effective and adequate training on quality control were faced by the respective organizations at low extent. This was shown by a mean score of 2.2821 and 2.1750 respectively.

Table 4.8: Challenges of Implementing Quality Management Practices

Challenges	Mean	Std. Deviation
Numerous layers in management levels leads to duplication of duties	3.3684	1.44112
Top management lack of commitment on quality implementation	2.6923	.97748
Competition at the expense of implementation	2.5897	1.18584
Cultural dynamism	2.5500	.95943
Poor leadership by top management hinder quality management implementation	2.5000	1.39596
Inadequate resources for implementing quality management practices	2.2821	1.09901
Little attention to quality management practices	2.2500	1.14914
Lack of effective and adequate training on quality control	2.1750	1.19588

Source: Research Data, 2015

These results are consistent with Edwards, Roberts and Clarke (2002), Chen and Paulraj (2004) and De Boor (2001) who found that the challenges of quality management practices are poor leadership, duplication of duties due to numerous management layers, non commitment from top management and inadequate resources

for implementing quality management practices. While the results are contradicting with Wathiru (2013), who stated that lots of data documentation, treating certification as an end, long time needed to see results, high cost of operations, too much time needed, complicates operations, resistance from managers, lack of management commitments, and resistance from workers and lack of qualified personnel as some of the challenges of implementing.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study was carried out to establish relationship between quality management practices and supply chain performance in large manufacturing firms in Nairobi, Kenya. This chapter presents the summary of findings for the research objectives, conclusion, limitations, recommendations made based on the findings and suggestions on the areas that need to be researched further in the study.

5.2 Summary of Findings and Discussions

The results of the first objective indicated that quality management practices have been practiced to a large extent by the manufacturing firms. The findings indicated that continuous quality improvement, six sigma practices, international organization for standardization, lean operations/production, benchmarking and supplier partnering have been implemented by respective organizations at a large extent.

The findings of the second objective through regression analysis found out that 95.9% of the changes in supply chain performance could be attributed to the combined effect of the independent variables (quality management practices). Through the analysis of variance table the finding was that F significance value of 0.00 indicates that regression model has probability of 0% of giving wrong prediction thus it was concluded that the regression model is statistically significant, hence a positive relationship between dependent variable (supply chain performance) and independent variables.

The findings on the third objective indicated that the most seriously faced challenges were: numerous layers in management levels leading to duplication of duties which the respondents reported they were facing to a great extent while top management lack of commitment on quality implementation, competition at the expense of implementation, cultural dynamism and poor leadership by top management hinder quality management implementation were faced by respective organizations at moderate extent and inadequate resources for implementing quality management practices and lack of effective and adequate training on quality control were faced by the respective organizations at a low extent.

5.3 Conclusion

From the findings of the study, it can be concluded that quality management practices are being practiced by large manufacturing firms in Nairobi, Kenya. This implies the first objective has been achieved. From the findings of the study, it can also be concluded that the second objective was achieved. This is evident through a positive relationship between dependent variable (supply chain performance) and independent variables (continuous quality improvement, six sigma practice, lean operations/production, international organization for standardization, benchmarking and supplier partnering). The findings of the third objective indicated that there are challenges associated with the adoption of quality management practices hence it can be concluded that the third objective has been achieved. It can be therefore concluded generally that quality management practices will assist firms in large manufacturing industry to improve supply chain performance. According to the study, quality management practices (continuous quality improvement, six sigma practice, lean operations/production, international organization for standardization, benchmarking and supplier partnering) play a critical role in supply chain performance.

5.4 Recommendations

The study recommends that all large manufacturing firms in Nairobi should adopt the quality management practices (continuous quality improvement, six sigma practice, lean operations/production, international organization for standardization, benchmarking and supplier partnering) to improve their supply chain performance since there is a positive relationship between quality management practices and supply chain performance.

5.5 Limitations of the Study

The findings of this study are specific to the large manufacturing firms in Nairobi, Kenya. Therefore studies from other sectors can be done. The data was collected by Likert scale questionnaires hence, the results might have biases of the respondents reflected in the results and therefore a possibility that if respondents were different, the results might be different. Some firms were not ready to participate in answering the questionnaires, citing lack of time and others confidentiality of their data.

5.6 Suggestions for Further Research

The study shows there is growing importance among the companies hence need to conduct further research on how quality management practices affect performance of firms in the services industry as well as other types of organizations such as wholesalers and retailers. Also other studies should try to find out why international organizations for standardization, benchmarking and lean operations/production were not significant.

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APPENDICES

APPENDIX I: SAMPLE QUESTIONNAIRE

This Research is conducted with the authorization of the University of Nairobi, Faculty of commerce and School of Business. (Please tick responses as appropriate. where necessary tick as many items as you find relevant.)

SECTION A: GENERAL INFORMATION

(Please tick responses as appropriate and where necessary tick as many items as you find relevant.)

Section A (i): Demographic information of the Respondents

1. What is your current title or position?

- a) Supply chain manager []
- b) Assistant supply chain manager []
- c) Quality assurance manager []
- d) Assistant quality assurance manager []
- e) Other (specify).....

2. How long have you worked in your current position?

- a) Less than 5 years []
- b) 5 to 10 years []
- c) 11 to 15 years []
- d) Above 15 years []

3. How many years have you worked for the organization?

- a) Less than 5 years []
- b) 5 to 10 years []
- c) 11 to 15 years []
- d) Above 15 years []

Section A (ii) Demographic information for the Organization

1. Name of the Organization (optional).....

2. Duration that the organization has been in operation

Less than 10 years More than 10 years

3. Number of permanent employees

a). 2– 35 [] b). 36 – 69 [] c). 70 – 103 [] d). Above 103[]

SECTION B: QUALITY MANAGEMENT PRACTICES USED BY LARGE SCALE MANUFACTURING FIRMS IN KENYA

Please indicate the extent to which you agree with the following statements on the Quality Management Practices used by Large Scale manufacturing Firms in Kenya.

The scale below will be applicable: 1=very small extent, 2= small extent, 3= moderate extent, 4= Large extent, 5= to a very large extent.

No	Statement	1	2	3	4	5
	Continuous quality improvement					
1	Our organization does not focus as much on creating a corporate quality culture, but more on the process of quality improvement					
2	Our organization attempts to develop a quality system that is never satisfied					
3	Our organization strives for constant innovation to improve work processes and systems by reducing time-consuming, low value-added activities					
4	Our organization focuses on improving processes to enable companies give customers what they want the first time, every time					

5	Our organization ensure effective and efficient supply chain channels in delivery of value adding goods and services					
Six sigma practice						
1	Our organization measures and improves high-volume production processes					
2	Our organization measures and eliminates waste by attempting to achieve near perfect results					
3	Our organization has a disciplined, data-driven approach and methodology for eliminating defects (driving toward six standard deviations between the mean and the nearest specification limit) in any process from manufacturing to transactional and from product to service					
4	Our organization has a tool that plays an important in elimination of waste and increasing efficiency					
5	Our organization has a positive image to the customers and other stakeholders on quality goods and services offered by a particular firm					
International Organization for Standardization						
1	Our organization's series of standards, define, establish, and maintain a quality assurance system for our industry					
2	Our organization has requirements and recommendations that specify how management operations are to be conducted at a company to ensure that quality is the end result.					
3	Our organization conforms to a specification that sets standards for companies to follow by ensuring that quality is achieved					

4	The standard covers all aspects of our organization's activities, including: identifying its key processes, defining roles and responsibilities, its policies & objectives, and documentation requirements					
5	Our organization covers the importance of understanding & meeting customer requirements, communication, resource requirements, training, product & process planning, design processes, purchasing, production & service, monitoring and measurement of products & processes, customer satisfaction, internal audit, management review, and improvement processes					
Lean Operations/Production						
1	Our organization concentrates time and effort on identifying and refining steps in an operation that the customer deems valuable, and to eliminate wasteful or unnecessary steps in a process					
2	Our organization relies heavily on the observation of processes by management, as well as the importance of clean and efficient work spaces					
3	The Lean way to determine value in our organization is whether or not customers will pay for that step in the process					
4	Our organization eliminates the steps that the customer is not willing to pay for without affecting the end product or service					
5	Our organization uses Just-in-Time to focus on rapid throughput as well as reducing inventory to provide improvements on operations					
Benchmarking						
1	Our organization continuously compares and measures itself against business leaders anywhere in the world to gain information and provide a guideline for rational performance goals					

2	Our organization has a continuing process of measuring products, services, and practices against your strongest competitors					
3	Our organization applies two types of benchmarking to assess quality: competitive benchmarking and non competitive benchmarking					
4	Our organization compares specific numerical or statistical measurements return on assets used and the market share against direct competitors in the marketplace					
Supplier Partnering						
1	Our organization works directly with their parts and components suppliers to improve quality at the supplier's location					
2	Our organization has direct participation in the supplier's operations i.e. staff from the manufacturer might work on site at the supplier's office or provide technical assistance and equipment or simply a very close working relationship that more resembles a partnership rather than a simple business transaction between two unrelated firms					
3	Our organization involves in sharing the use of statistical controls					
4	Our organization helps the suppliers meet quality standards to address the quality issues in the manufacturer-supplier relationship					

SECTION C (i): QUALITY MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE

Please indicate the extent to which you concur with the following statements concerning the relationship that exists between quality management practices and supply chain performance of large scale manufacturing firms in Kenya. Using the following rating; 5 = very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

No	Statement	1	2	3	4	5
	Continuous Quality Improvement					
	Results to increased satisfaction and delight for both customers and employees.					
	Six Sigma Practice					
	It reduces defects					
	International Organization for Standardization					
	Helps in identifying its key processes					
	Lean Operations/Production					
	Helps in identifying and refining steps in an operation that the customer deems valuable					
	Benchmarking					
	Helps to gain information and provide a guideline for rational performance goals					
	Supplier partnering					
	Improve quality at the supplier's location					

Any other; (please specify)

SECTION C (ii): SUPPLY CHAIN PERFORMANCE (MARKET SHARE)

The following measures give an indication of the large manufacturing firms' supply chain performance. In a scale of 1 – 5 please indicate the extent of the manufacturing firms' market share. Using the following rating; 5 = very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

Supply Chain Performance	1	2	3	4	5
Increase in customer loyalty					
Increase in profitability					
Pricing					

SECTION D: CHALLENGES OF IMPLEMENTING QUALITY MANAGEMENT PRACTICES

Please indicate the barriers of quality management practices implementation within your organization, rank by a tick in the appropriate box the nature and extent to which you consider these attributes significant using the following rating; 5 =Strongly agree, 4 = Agree, 3 = Neither agree not disagree, 2 = Disagree, 1 = Strongly disagree

		5	4	3	2	1
1.	Poor leadership by our top management hinder effective implementation of quality management practices					
2.	Numerous layers in the management levels of our organization leads to duplication of duties, this negatively effects supply chain performance					
3.	Failure by our top management to commit itself on quality management implementation					
4.	Cultural dynamism makes total quality implementation difficult in our organization because management is rigid in their ways of doing things.					
5.	The top management focus more on competition at the expense of implementation of quality management practices					
6.	Inadequate resources for implementing quality management practices is a problem to our firm					

7.	Our firm do not involve quality in their strategic plan; little attention is paid to quality management in terms of human and financial resources					
8.	Our organization lack effective and adequate training on quality control					

Any other; (please indicate)

THANK YOU FOR YOUR TIME

APPENDIX 11

Sector:6 Building, Construction and Mining	
Central Glass Industries Ltd	Kenya Builders & Concrete Ltd
Karsan Murji & Company Limited	Manson Hart Kenya Ltd
Kenbro Industries Ltd	Mombasa Cement Ltd
Sector:100 Food, Beverages and Tobacco	
Africa Spirits Ltd Highlands	Mineral Water Co. Ltd
Agriner Agricultural Development Limited	Homeoil
Belfast Millers Ltd Insta	Products (EPZ) Ltd
Bidco Oil Refineries Ltd	Jambo Biscuits (K) Ltd
Bio Foods Products Limited	Jetlak Foods Ltd
Breakfast Cereal Company(K) Ltd	Karirana Estate Ltd
British American Tobacco Kenya Ltd	Kenafric Industries Limited
Broadway Bakery Ltd	Kenblest Limited
C. Czarnikow Sugar (EA) Ltd	Kenya Breweries Ltd
Cadbury Kenya Ltd Kenya	Nut Company Ltd
Centrofood Industries Ltd	Kenya Sweets Ltd
Coca cola East Africa Ltd	Nestle Kenya Ltd
Confec Industries (E.A) Ltd	Nicola Farms Ltd
Corn Products Kenya Ltd	Palmhouse Dairies Ltd
Crown Foods Ltd	Patco Industries Limited
Cut Tobacco (K) Ltd	Pearl Industries Ltd
Deepa Industries Ltd	Pembe Flour Mills Ltd
Del Monte Kenya Ltd	Premier Flour Mills Ltd
East African Breweries Ltd	Premier Food Industries Limited
East African Sea Food Ltd	Proctor & Allan (E.A.) Ltd
Eastern Produce Kenya Ltd	Promasidor (Kenya) Ltd
Farmers Choice Ltd	Trufoods Ltd
Frigoken Ltd	UDV Kenya Ltd
Giloil Company Limited	Unga Group Ltd
Glacier Products Ltd	Usafi Services Ltd
Global Allied Industries Ltd	Uzuri foods Ltd
Global Beverages Ltd	ValuePak Foods Ltd
Global Fresh Ltd W.E.	Tilley (Muthaiga) Ltd
Gonas Best Ltd	Kevian Kenya Ltd
Hail & Cotton Distillers Ltd	Koba Waters Ltd
Al-Mahra Industries Ltd	Kwality Candies & Sweets Ltd
Alliance One Tobacco Kenya Ltd	Lari Dairies Alliance Ltd
Alpha Fine Foods Ltd	London Distillers (K) Ltd
Alpine Coolers Ltd	Mafuko Industries Ltd

Annum Trading Company Limited	Manji Food Industries Ltd 61
Aquamist Ltd	Melvin Marsh International
Brookside Dairy Ltd	Kenya Tea Development Agency
Candy Kenya Ltd	Mini Bakeries (Nbi) Ltd
Capwell Industries Ltd	Miritini Kenya Ltd
Carlton Products (EA) Ltd	Mount Kenya Bottlers Ltd
Chirag Kenya Limited	Nairobi Bottlers Ltd
E & A Industries Ltd	Nairobi Flour Mills Ltd
Kakuzi Ltd	NAS Airport Services Ltd
Erdemann Co. (K) Ltd	Rafiki Millers Ltd
Excel Chemical Ltd	Razco Ltd
Kenya Wine Agency Limited	Re-Suns Spices Limited
Highlands Canner Ltd	Smash Industries Ltd
Super Bakery Ltd	Softa Bottling Co. Ltd
Sunny Processor Ltd	Spice World Ltd
Spin Knit Dairy Ltd	Wrigley Company (E.A.) Ltd
Sector: 62	Chemical and Allied
Anffi Kenya Ltd	Crown Berger Kenya Ltd
Basco Product (K) Ltd	Crown Gases Ltd
Bayer East Africa Ltd	Decase Chemical (Ltd)
Continental Products Ltd	Deluxe Inks Ltd
Cooper K- Brands Ltd	Desbro Kenya Limited
Cooper Kenya Limited	E. Africa Heavy Chemicals (1999) Ltd
Beiersdorf East Africa Ltd	Elex Products Ltd
Blue Ring Products Ltd	European Perfumes & Cosmetics Ltd
BOC Kenya Limited	Galaxy Paints & Coating Co. Ltd
Buyline Industries Limited	Grand Paints Ltd
Carbacid (CO2) Limited	Henkel Kenya Ltd
Chemicals & Solvents E.A. Ltd	Imaging Solutions (K) Ltd
Chemicals and Solvents E.A. Ltd	Interconsumer Products Ltd
Coates Brothers (E.A.) Limited	Odex Chemicals Ltd
Coil Products (K) Limited	Osho Chemicals Industries Ltd
Colgate Palmolive (E.A) Ltd	PolyChem East Africa Ltd
Johnson Diversity East Africa Limited	Procter & Gamble East Africa Ltd
Kel Chemicals Limited	PZ Cussons Ltd
Kemia International Ltd	Royal Trading Co. Ltd
Ken Nat Ink & Chemical Ltd	Reckitt Benckiser (E.A) Ltd
Magadi Soda Company Ltd	Revolution Stores Co. Ltd
Maroo Polymers Ltd	Soilex Chemical Ltd
Match Masters Ltd	Strategic Industries Limited
United Chemical Industries Ltd	Supa Brite Ltd

Oasis Ltd	Unilever Kenya Ltd
Rumorth EA Ltd	Murphy Chemical E.A Ltd
Rumorth East Africa Ltd	Syngenta East Africa Ltd 62
Sadolin Paints (E.A.) Ltd	Synresins Ltd
Sara Lee Kenya Limited	Tri-Clover Industries (K) Ltd
Saroc Ltd	Twiga Chemical Industries Limited
Super Foam Ltd	Vitafoam Products Limited
Sector:42 Energy, Electrical and Electronics	
A.I Records (Kenya) Ltd	East African Cables Ltd
Amedo Centre Kenya Ltd	Eveready East Africa Limited
Assa Abloy East Africa Ltd	Frigorex East Africa Ltd
Aucma Digital Technology Africa Ltd	Holman Brothers (E.A.) Ltd
Avery (East Africa) Ltd	IberaAfrica Power (EA) Ltd
Baumann Engineering Limited	International Energy Technik Ltd
Centurion Systems Limited	Kenwest Cables Ltd
Digitech East Africa Limited	Kenwestfal Works Ltd
Manufacturers & Suppliers (K) Ltd	Kenya Power & Lighting Co. Ltd
Marshall Fowler (Engineers) Ltd	Kenya Scale Co. Ltd/ Avery
Mecer East Africa Ltd	Kenya Ltd
Metlex Industries Ltd	Kenya Shell Ltd
Metsec Ltd	Libya Oil Kenya Limited
Modulec Engineering Systems Ltd	Power Technics Ltd
Mustek East Africa Sanyo	Reliable Electricals Engineers Ltd
Nationwide Electrical Industries	Armo (Kenya) Ltd
Nationwide Electrical Industries Ltd	Socabelec East Africa
Optimum Lubricants Ltd	Sollatek Electronics (Kenya) Limited
PCTL Automation Ltd	Specialised Power Systems Ltd
Pentagon Agencies Tea	Synergy-Pro
Power Engineering International Ltd	Vac Machinery Limited
Sector: 54 Plastics and Rubber	
Betatrad (K) Ltd	ACME Containers Ltd
Blowplast Ltd	Afro Plastics (K) Ltd
Bobmil Industries Ltd	Alankar Industries Ltd
Complast Industries Limited	Dune Packaging Ltd
Kenpoly Manufacturers Ltd	Elgitread (Kenya) Ltd
Kentainers Ltd	Elgon Kenya Ltd
King Plastic Industries Ltd	Eslon Plastics of Kenya Ltd
Kingway Tyres & Automart Ltd	Five Star Industries Ltd
L.G. Harris & Co. Ltd	General Plastics Limited
Laneeb Plastics Industries Ltd	Haco Industries Kenya Ltd
Metro Plastics Kenya Limited	Hi-Plast Ltd

Ombi Rubber Rollers Ltd	Jamlam Industries Ltd
Packaging Industries Ltd	Kamba Manufacturing (1986) Ltd
Plastics & Rubber Industries Ltd	Keci Rubber Industries
Polyblend Limited	Nairobi Plastics Industries
Polyflex Industries Ltd	Nav Plastics Limited
Polythene Industries Ltd	Ombi Rubber
Premier Industries Ltd	Packaging Masters Limited
Prestige Packaging Ltd	Plastic Electricons
Prosel Ltd	Raffia Bags (K) Ltd
Qplast Industries	Rubber Products Ltd
Sumaria Industries Ltd	Safepak Limited
Super Manufacturers Ltd	Sameer Africa Ltd
Techpak Industries Ltd	Sanpac Africa Ltd
Treadsetters Tyres Ltd	Silpack Industries Limited
Uni-Plastcis Ltd	Solvochem East Africa Ltd
Wonderpac Industries Ltd	Springbox Kenya Ltd
Sector:38	Textile and Apparels
Africa Apparels EPZ Ltd	MRC Nairobi (EPZ) Ltd
Fulchand Manek & Bros Ltd	Ngecha Industries Ltd
Image Apparels Ltd	Premier Knitwear Ltd
Alltex EPZ Ltd	Protex Kenya (EPZ) Ltd
Alpha Knits Limited	Riziki Manufacturers Ltd
Apex Appaels (EPZ) Ltd	Rolex Garments EPZ Ltd
Baraka Apparels (EPZ) Ltd	Silver Star Manufacturers Ltd
Bhupco Textile Mills Limited	Spinners & Spinners Ltd
Blue Plus Limited	Storm Apparel Manufacturers Co. Ltd
Bogani Industries Ltd	Straightline Enterprises Ltd
Brother Shirts Factory Ltd	Sunflag Textile & Knitwear Mills Ltd
Embalishments Ltd	Tarpo Industries Limited
J.A.R Kenya (EPZ) Ltd	Teita Estate Ltd
Kenya Trading EPZ Ltd	Thika Cloth Mills Ltd
Kikoy Co. Ltd	United Aryan (EPZ) Ltd
Le-Stud Limited	Upan Wasana (EPZ) Ltd
Metro Impex Ltd	Vaja Manufacturers Limited
Midco Textiles (EA) Ltd	Yoochan Kenya EPZ Company Ltd
Mirage Fashionwear EPZ Ltd	YU-UN Kenya EPZ Company Ltd
Sector: 22	Timber, Wood Products and Furniture
Economic Housing Group Ltd	Rosewood Office Systems Ltd
Eldema (Kenya) Limited	Shah Timber Mart Ltd
Fine Wood Works Ltd	Shamco Industries Ltd
Furniture International Limited	Slumberland Kenya Limited

Hwan Sung Industries (K) Ltd	Timsales Ltd
Kenya Wood Ltd	Wood Makers Kenya Ltd
Newline Ltd	Woodtex Kenya Ltd
PG Bison Ltd	United Bags Manufacturers Ltd
Transpaper Kenya Ltd	Statpack Industries Ltd
Twiga Stationers & Printers Ltd	Taws Limited 64
Uchumi Quick Suppliers Ltd	Tetra Pak Ltd
Sector:20 Pharmaceutical and Medical Equipment	
Alpha Medical Manufacturers Ltd	Dawa Limited
Beta Healthcare International Limited	Elys Chemical Industries
Biodeal Laboratories Ltd	Gesto Pharmaceutical Ltd
Bulks Medical Ltd	Glaxo Smithkline Kenya Ltd
Cosmos Limited	KAM Industries Ltd
Laboratory & Allied Limited	KAM Pharmacy Limited
Manhar Brothers (K) Ltd	Pharmaceutical Manufacturing Co.
Madivet Products Ltd	Regals Pharmaceuticals
Novelty Manufacturing Ltd	Universal Corporation Limited
Oss. Chemie (K) Pharm	Access Africa Ltd
Sector:38 Metal and Allied	
Allied Metal Services Ltd	Booth Extrusions Limited
Alloy Street Castings Ltd	City Engineering Works Ltd
Apex Street Ltd	Rolling Mill Division Crystal Industries Ltd
ASL Ltd	Davis & Shirliff Ltd
ASP Company Ltd	Devki Steel Mills Ltd
East Africa Foundry Works (K) Ltd	East Africa Spectre Limited
Elite Tools Ltd	Kens Metal Industries Ltd
Friendship Container Manufacturers	Khetshi Dharamshi & Co. Ltd
General Aluminum Fabricators Ltd	Nampak Kenya Ltd
Gopitech (Kenya) Ltd	Napro Industries Limited
Heavy Engineering Ltd	Specialized Engineer Co. (EA) Ltd
Insteel Limited Steel	Structures Limited
Metal Crown Limited	Steelmakers Ltd
Morris & Co. Limited	Steelwool (Africa) Ltd
Nails & Steel Products Ltd	Tononoka Steel Ltd
Orbit Engineering Ltd	Welding Alloys Ltd
Rolmil Kenya Ltd	Wire Products Limited
Sandvik Kenya Ltd	Viking Industries Ltd
Sheffield Steel Systems Ltd	Warren Enterprises Ltd
Sector:8 Leather Products and Footwear	

Alpharama Ltd	CP Shoes
Bata Shoe Co. (K) Ltd	Dogbones Ltd
New Market Leather Factory Ltd	East Africa Tanners (K) Ltd
C & P Shoe Industries Ltd	Leather Industries of Kenya Limited
Sector: 17 Motor Vehicle Assembly and Accessories	
Auto Ancillaries Ltd Kenya	Vehicle Manufacturers Limited
Varsani Brakelining Ltd	Labh Singh Harnam Singh Ltd
Bhachu Industries Ltd	Mann Manufacturing Co. Ltd
Chui Auto Spring Industries Ltd	Megh Cushion industries Ltd
Toyota East Africa Ltd Mutsimoto	Motor Company Ltd
Unifilters Kenya Ltd	Pipe Manufacturers Ltd
General Motor East Africa Limited	Sohansons Ltd
Impala Glass Industries Ltd	Theevan Enterprises Ltd
Kenya Grange	Vehicle Industries Ltd
Sector: 48 Paper and Paperboard	
Ajit Clothing Factory Ltd	Conventual Franciscan Friars-Kolbe Press
Associated Papers & Stationery Ltd	Creative Print House
Autolitho Ltd	D.L. Patel Press (Kenya) Limited
Bag and Envelope Converters Ltd	Dodhia Packaging Limited
Bags & Balers Manufacturers (K) Ltd	East Africa Packaging Industries Ltd
Brand Printers	Elite Offset Ltd
Business Forms & Systems Ltd	Ellams Products Ltd
Carton Manufacturers Ltd	English Press Limited
Cempack Ltd	General Printers Limited
Chandaria Industries Limited	Graphics & Allied Ltd
Colour Labels Ltd	Guaca Stationers Ltd
Colour Packaging Ltd	Icons Printers Ltd
Colour Print Ltd	Interlabels Africa Ltd
Kenya Stationers Ltd	Jomo Kenyatta Foundation
Kim-Fay East Africa Ltd	Kartasi Industries Ltd
Paper Converters (Kenya) Ltd	Kenafric Diaries Manufacturers Ltd
Paper House of Kenya Ltd	Kitabu Industries Ltd
Paperbags Limited	Kul Graphics Ltd
Primex Printers Ltd	Label Converters
Print Exchange Ltd	Modern Lithographic (K) Ltd
Printpak Multi Packaging Ltd	Pan African Paper Mills (EA) Limited
Printwell Industries Ltd	Ramco Printing Works Ltd
Prudential Printers Ltd	Regal Press Kenya Ltd
Punchlines Ltd	SIG Combibloc Obeikan Kenya

Source: (KAM, 2014)