STRATEGIC QUALITY MANAGEMENT PRACTICES AND OPERATIONAL PERFORMANCE OF CEMENT MANUFACTURING FIRMS IN KENYA

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DECLARATION

This research project is my original work and it has not been presented in any university for an award of merit.

Signature……. Date……

Beth Makandi Mburugu

D61/71051/2014

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

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Last but not least, I thank the Almighty God for the strength to undertake this project

DEDICATION

This project is specially dedicated to Mum and Dad, whose emphasis on the importance to further my education highly motivated me to finish The MBA program.

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ABBREVIATIONS AND ACRONYMS

COPQ	Cost of Poor Quality
CWQC	Company Wide Quality Control
KAM	Kenya Association of Manufacturers
PCC	Per capita consumption
ROA	Return on Assets
ROI	Return on Investment
RDT	Resource Dependence Theory
SQM	Strategic Quality Management
TQM	Total Quality Management
ISO	International Organization for Standardization
OP	Operational performance

ABSTRACT

The environment where organisations conduct their business is increasingly changing, and this has forced organisations to adapt to this environment for survival and continuance meeting of customer needs. Adoption and use of SQM practices is seen as a reliable way that organisations can use to marshal organisations and other actors towards achieving customer satisfaction at lower costs, minimization of wastage and superior quality. The research objectives of this study were to: establish the practices SQM used by cement manufacturing firms in Kenya and determine the link between SQM practices and OP. The study was guided by Resource-Based View, Knowledge-Based View and Resource Dependency Theory. To accomplish the goal of this study, a descriptive research survey was employed to establish current and existing conditions among variables as well as relationships between variables. A census survey of seven (7) cement manufacturing firms was conducted and primary data was collected with help of semi-structured questionnaires that were administered to: finance managers, quality assurance managers and operations managers by drop and pick them later at an agreed upon time with the researcher. The analysis of data was achieved through the use of descriptive statistics: mean, standard deviation and inferential statistics: regression analysis. The study found out that the most popular SQM practices embraced by cement manufacturing firms were business process re-engineering, benchmarking, ISO certification and six sigma. The findings further established that SQM practices were utilized to a great extent. It was further discovered that the regression model utilized in this study was a good fit for the data: the coefficient of determination was found to be 65.4%, and analysis was variance attained a p-value that was smaller than 5% (0.000), which implied the overall regression model was statistically significant. Business process re-engineering, Six Sigma and ISO certification were positively and significantly related to OP while benchmarking was insignificantly and negatively related to OP. It was concluded that the challenges that hindered successful implementation of SQM included training and development programs, finances, top management support. Other challenges were resistance to change and employee turnover. It is highly recommended that cement manufacturing firms should embrace internal benchmarking. Thus, departmental heads can easily borrow best practices from best performing department this will boost OP and impact on overall organisational performance. Top management should offer sufficient support and encourage employees to embrace SQM practices, and sponsor them to training and development programs to boost their skills and improve efficiency in their work. The main constraint of this research study is that the researcher was limited to time and resources and this limited the scope of the study to cement manufacturing firms as opposed to all manufacturing firms in Kenya. Therefore, it is required that future researchers should do a facsimile of this study to include all manufacturing firms in Kenya so as to do a comparison of findings after which a more exhaustive and reliable conclusion may be drawn.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The dynamic nature of the business setting has necessitated quality improvement. Quality is seen as a strategy that a firm can adopt to boost competitive advantage. Ross, Peter and Robert (2011) put more emphasis that quality is a critical component meant to address customer needs sustainably. Firms are seeking to improve quality of their products or services in order to survive and cope with the competition. Customer satisfaction is an essential element in order to improve organisational performance which is achieved through upholding quality management practices among them total quality management (TQM). Some of the principles of TQM (such as customer focus and leadership) dictate that to achieve quality in an organisation, employees must have a shared vision, ideas and work together towards producing quality products and services that match customer demands. TQM consists of various quality instruments, approaches, values and beliefs that employees share (Gharakhani et al., 2013). Strategic quality management (SQM) is an element of quality management that lays much focus on the strategy that an organisation puts in place to management quality. Implementing strategic quality management successfully is not a simple operation approach (Deming, 1989).

In Kenya, cement manufacturing companies are facing a difficult time as a result of evolving customer needs that have forced them invest in innovation and modern technologies in an effort to provide quality products and services and improve efficiency in order to continuously address customer needs (Keinan & Karugu, 2018).

Due to an increasingly demand for cement and need to outweigh competition from other importers from the region, there is need for cement manufacturing firms to adopt and use SQM practices to: maintain and sustain quality of products and services offered, reduce lead time, minimize costs, improve value addition and boost firm operations (Jerono & Kimutai, 2018).

1.1.1 Strategic Quality Management

According to Werner and Weckenmann (2012), strategic quality management (SQM) is defined as the method and deployment of quality management in the framework of strategic planning in a manner that is in line with different initiatives for instance enterprise process re-engineering, target analysis and stock control. Dean and Bowen (2011), define SQM as a strategy of integrating quality management ideologies into three stages of strategic planning (analysis, direction and execution). This implies that the quality notions are aligned into organisational vision and goals in policy design and activities needed to achieve transformation management and strategy deployment. SQM is appropriate for both small and established firms including the ones that are experiencing great progression. It is predicted that fresh firms may also now not have in reality integrated SQM in their strategic planning processes. SQM enable firms to set their strategic direction and improve quality management through a careful formulation of process and activities that contribute towards improved product and service quality. Black and Porter (2010) argue that effective adoption of SQM practices enables the firm to align itself towards continuous improvement through incorporating quality control measures.

Organisations embrace SQM in order to address the quality needs of its customers through commitment and exploiting core competencies to produce products that are superior in quality and unique services that are difficult to duplicate. Organisations that are reluctant to embrace SQM do not perform as well as expected because the approach they adopt is not aligned with methods or these processes are not properly co-ordinated with each other. Thus, compelling quality administration cannot be effectively executed in segregation from other initiatives including the overall firm's strategy. To achieve successful deployment, firms need to align quality initiatives with systems framework and management mechanisms. Some processed are entrenched in processes that offer value to the customers. These processes are in turn part of the business line. Businesses are conducted in an environment where there are customers, suppliers, rivals and compliments. Quality costs, quality function deployment and target analysis including other quality management mechanisms are integrated in this framework. This mechanism is an applied approach of deploying SQM that makes quality management more effective and productive (Wang, 2009).

1.1.2 Operational Performance

Operational performance (OP) involves aligning the business units in an organisation to ensure that they are working towards achieving similar goals. Boyer and Lewis (2012) indicated that operational performance allows organisations to make effective use of their available resources such as knowledge and human assets to achieve corporate goals and objectives. Achieving operational performance is considered critical by firms that aspire to be best and compete with their rivals on the basis of efficiency and competitiveness. Wong, Lai and Cheng (2011) argue that operational performance enables firms to deliver their services efficiently to the customers and improve value for products or services. Neely (2005) explains that by assessing the

operational performance, the firm can determine the level of efficiency and effectiveness of past actions. The firm can determine how well the organisation is managed and the value that it is able to deliver to customers and the stakeholders. OP can be looked at from customisability of products or services, addressing customer needs beyond their expectation, overall cost of producing products or services including delivery time (Moullin, 2002).

Zhang and Huo (2013) contend that operational performance also considers organisational performance that entails productivity, quality and service delivery. OP entails enhancing cost performance which implies that organisations need to establish wastage and inefficiencies in their processes. Operational performance is associated to an organisation's ability to produce and deliver products to customers (Green, Zelbst, Meacham & Bhadauria, 2012). Chadzoudes and Chadzoglou, (2011) pointed out a few important indicators such as cost reduction, low lead time, high inventory turnover and customer satisfaction. Operational performance was assessed using the following indicators: cost, time and quality.

1.1.3 Cement Manufacturing Firms in Kenya

The drivers of growth include consumption that involves the rising demand for housing that have led to an increased demand in private sector funding for housing developments. The commercial construction boom has been fuelled by a rise in foreign investment, government and donor-funding spending on the country's mega infrastructural projects. As a result, per capita consumption (PCC) of cement has risen to an average of 83.9 kilograms (kg) in 2011 from 50 kilograms in 2006 despite the constant growth in annual population. Building and construction industry in Kenya is among the fastest growing sectors in Kenya with an aggregate growth rate of 14.2%

(2006-2011). Cement manufacturing industry in Kenya is identified as an important sector that has potential to boost other sectors in the economy especially building and construction industry (Keinan & Karugu, 2018).

There are 7 cement-manufacturing firms: Ndovu Cement Foundation, Bamburi Cement Limited, East African Portland Cement Company, Mombasa Cement Limited, National Cement Company, Athi River Mining Limited and Savannah Cement Limited (KAM, 2017). Currently, more than 90% of local cement manufacturers are located in Machakos County primarily in Athi River. This area provides a ready market for cement given the numerous construction activities that take place in this area. This has increased the demand for cement hence creating a need to produce more cement to cater for this demand (Jerono & Kimutai, 2018).

Cement is a critical component in infrastructural development and an essential input in the construction sector especially in government's housing and infrastructure programmes which are vital for the country's socioeconomic growth and development (Dyer & Blair, 2012). A growing demand for cement within the country and in the region (from places such as Southern Sudan, Rwanda and Burundi) has increased sales in cement manufacturing firms and thus creating the need to increase the quality of products and services to cater for the growing needs of customers and improve performance. Cement manufacturing firms in Kenya face several challenges due to inefficiencies in their operations; this results into stock out costs, delayed lead time and increase in customer complaints (Dyer & Blair, 2012). The rise in demand for cement is attributed to various construction activities that have forced cement manufacturing firms to adopt SQM in order to yield excellence goods and services that add value to customers and ensure on time delivery of goods and services.

1.2 Research Problem

Organisations are operating in an environment where customer needs evolve so fast, competition is getting tauter with increasing uncertainties and risks. Organisations wishing to survive in this form of an environment and pursue their goals have been forced to think of unique ways they can use to continuously offer quality products and services through adopting SQM practices and approaches to mobilize organisations and stakeholders to realize sustainable customer satisfaction at lower costs. Spitzer (2012) argues quality initiatives must be implemented across all organisational functions since they are interrelated. Company-wide quality initiative must cut across all management levels since strategic quality is meant to achieve functional excellence and not necessarily competitive advantage (Lakhal, Pasin & Limam, 2006).

Cement industry in Kenya has had an impressive growth due to an increasing demand for cement emanating from the real estate and property development in Kenya (Ndetto, 2013). Cement manufacturing firms are now looking for coping strategies in order to survive. SQM is a way that cement manufacturing firms can consider in order to align quality management principles into set goals and targets to cater for the unprecedented demand for cement across the country.

Ross, Peter and Robert (2011) found a positive link between SQM and operational performance of service firms in Europe. Carlos, Maria and Ana (2011) found a positive correlation between SQM and performance. Davood, Hossein, Mohammad and Arshad (2013) revealed that TQM focused on improving continuous process within organisations to deliver customer value and needs. It was further concluded that TQM improved organisational performance.

Oriare (2011) investigated the adoption of TQM in managing strategy at Safaricom Limited and the findings showed that TQM adoption led to improved productivity and ability to compete in international markets. Mwai (2015) studied the effect of SQM on competitiveness of power supply a census study for generator suppliers in Kenya and the results showed a positive linkage between SQM practices and competitiveness. Nzioka (2016) found that SQM was positively linked to performance of airlines. A limited focus has been to the link between SQM and operational performance particularly cement manufacturing firms in Kenya; this therefore necessitates the need to investigate this area by finding an answer to the question: What is the effect of SQM on operational performance of cement manufacturing firms in Kenya?

1.3 Research Objective

The objectives of the study were to: -

i. Establish the strategic quality management practices adopted by cement manufacturing firms in Kenya.

ii. Determine the relationship between strategic quality management practices and operational performance of cement manufacturing firms in Kenya.

1.4 Value of the Study

Policy makers and Kenya Association of Manufacturers (KAM) can use the empirical findings to set policies that will encourage firms to adopt and implement SQM practices. This will promote fair competition among cement firms and promote quality services and improved customer value.

Operations management practitioners and the executive management of cement firms will learn some of the SQM best practices. They will understand how to measure

performance and role played by SQM in improving performance. Firms in other sectors will learn the benefits of SQM, the implementation challenges of these practices and their contribution towards improved performance.

Researchers and academicians will learn the theories supporting this study, their relevance and application to this study. In addition, they will increase their understanding of SQM practices and its contribution towards improved operational performance. The findings obtained in this study can be utilised as a basis for forthcoming studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Research in the field of SQM has received a growing attention from scholars over the last decades. This section details a discussion of the theoretical and empirical review on how SQM practices affects operational performance. Finally, a summary of the reviewed literature has been discussed and a conceptual framework.

2.2 Theoretical Framework

This section provides a detailed coverage of theories guiding this study. These theories are Resource-Based View, Knowledge-based View and Resource Dependency Theory. These theories base their foundation on the environment where an organisation operates, the need for distinct resources, importance of knowledge and how the firm exploits knowledge as a resource to enhance operational performance.

2.2.1 Resource-Based View

Resource-Based View (RBV) maintains that a business enterprise is component of a collection of capabilities. SQM aligns a firm in harnessing its resources and utilising it effectively towards improving performance. Building capabilities allows a firm to focus on its core competencies and thus maximise on its available resources. Firm performance recorded by firm differs significantly because of the uniqueness in resources and capabilities held by firms in various sectors (Hoopes, Madsen, Walker, 2003). Barney (2001) argues that resources present in a firm might increase as the firm strives to boost its effectiveness and improve performance. Resources held by a firm are input utilised in a firm's production process, that include; capital, labour, finance and equipment among others. Individual resources may not be sufficient to

enable a firm achieve a competitive edge but by collaboration and incorporation of competitive resources (David and Cynthia 1995).

RBV has been explored widely in establishing the nexus between a firm's internal characteristics and performance. The underlying idea is that the firm is a constituent of diverse resources combined to boost competitiveness (Barney, 2001). The way a firm uses its resources available has a huge impact on improving firm performance. Improving customer value is a critical function of SQM especially in aligning quality aspects into strategic plans (Kim, 2006; Alain and Martin, 2009). RBV supports and incorporates the concepts of SQM and performance. Zott (2002) argues that RBV stresses more on performance implications of a firm's utilisation of internal resources. He maintains that managing a firm's processes and procedures such as SQM and aligning this concept to improve performance is critical. David and Cynthia (1995) insist that aligning quality aspects into corporate strategy is a critical step in enhancing performance. Hoopes, Madsen and Walker (2003) contend that an organisation benefits greatly from minimisation of waste and efficiency and this enables businesses to increase sales and profitability.

2.2.2 Knowledge-Based View

Most scholars that subscribe to RBV perceived knowledge as a broad resource, some scholars (Murray 2000; Teece et al. 1997; Tiwana 2002) indicate that knowledge has unique traits that generates it worthwhile resource. Hamel and Prahalad (1994) indicate that know-how, intellectual assets and competencies are key drivers of superior performance. Evans (2003) and Tiwana (2002) also propose that knowledge is a critical component of the business enterprise. Evans (2003) indicates that material

resources decline when utilized in the business whereas knowledge assets improve with usage.

Tiwana (2002) opine that knowledge is one of the few resources that is hard to duplicate as opposed to technology, product sources and capital resource that can imitated with ease by other firms while Beckmann (1999) put forward that a five-level knowledge hierarchy having data, information, knowledge, know-how and competences. Zack (1999) categorizes organisational knowledge into three categories namely core knowledge, forward-thinking knowledge, and innovative knowledge.

Core knowledge is rudimentary knowledge that aids the firm to persist in the business market within the short-term, forward-thinking knowledge gives the organisation identical know-how as its challengers and lets the firm to compete actively in the short-term whereas innovative knowledge provides the organisation with competitive edge against other players. The organisation that has unique organisational know-how is capable of potentially being a market leader since it is able to introduce innovative products or services (Zack, 1999).

SQM offers a platform that enables firms to adopt and sustain quality practices efficiently. This enables firms to align business units towards achieving similar goals. Boyer and Lewis (2002) posit that operational performance helps firms to make maximum use of available resources and knowledge in managing processes and information to offer customer value by providing competitive rates and efficient services. Top management determines how well the firm is managed and the value that it can deliver to customers and stakeholders.

2.2.3 Resource Dependence Theory

This theory recognizes that very few organizations are self- sufficient. It therefore proposes that organizations engage in exchanges with their environment in order to obtain resources. Harrison and Van Hoek (2008) argued that through organizational interdependence, firms can synergistically combine their resources with complementary resources of the firms they are collaborating with, thereby creating a resource bundle that is unique and difficult to replicate, thereby resulting in competitive advantage. This study takes the view that interdependence is at the core of SQM, and so this study borrows from RDT.

2.3 Strategic Quality Management Practices

Various SQM practices are utilized by firms to realize operational performance. The study will discuss the following SQM practices: Business Process Reengineering, Benchmarking, ISO certification & Six Sigma.

2.3.1 Business Process re-engineering

Business process reengineering is one of the modern approach used by firms to advance the value of products, production systems and processes to achieve efficiency, responsiveness, effectiveness (Davood et al., 2013). Advancement in technology and transformation in business have resulted into increased competition and firms have been forced to rethink on their processes of production and methods with a view of coping with the changing needs and ways of doing things. Werner and Weckenmann (2012) insist that business process-reengineering systems of operations aim at enhancing speed, efficiency quality and value addition.

The concept of radicalization was extended by Zhang and Huo (2013), who established that business process management was gaining popularity and it embraced approaches and techniques used in analysing business processes. Wong, Lai and Cheng (2011), contend that use of business process reengineering is considered a better approach by firms in improvement and making relevant change despite the minimal changes (Werner & Weckenmann, 2012).

As pointed out in a study by Green, Zelbst, Meacham and Bhadauria (2012), firms utilize business process engineering to improve a different range of systems and processes that serve different needs at different stages of product development for improved efficiency and operational excellence. It is based on identifying weaknesses and gaps from the current processes and designs with the view of improving efficiency of these processes to enhance the quality of products and services, and to address evolving customer needs. This method entails planning and use of modern techniques to achieve better results through quality, speed cost and value addition.

2.3.2: Benchmarking

Organizations continuously use benchmarking as an SQM practice to compare their progress in terms of product quality, utility processes and operations. Organisations do a self-assessment by using benchmarking processes to improve performance (Caringo & Maria, 2006).

There are various types of benchmarking adopted by manufacturing organisations. These include benchmarking against the competitors, this is done directly (Wright and Richard, 2007), and the other benchmarking is the one that does not involve competitors in the market place.

Competitive benchmarking is categorised into two. The first is global benchmarking where performance of a business organization is compared with the best business organization in the world notwithstanding the industry (Wilkinson, Adrian & Hugh, 2006). Benchmarking analysts' maintain that competitive benchmarking is the best method for evaluating the company's performance in quality management. The second is benchmarking that is done by the organization against the firms that they compete with. It enables the organisation to achieve the same advantage of quality as its competitor or better. When the organisation is benchmarked against the best performing companies in the world market, it is motivated to perform better than other sectors in the same line of business. This is also an alternative way that the company can easily get access to the information regarding the organizations they do not compete with since their threats are not being felt the same company, this information could be significant to the company's performance and development.

The type of benchmarking that is considered non-competitive is benchmarking within the organization. This type of benchmarking is associated with comparing the subsystems of the whole organization in terms of their performance and quality management. It is essential for the businesses that are new entrants in the market or those that are applying the system for the first time (Hinckley & Martin, 2007).

2.3.3 International Organization for Standardization (ISO) Certification

In the world of business today, quality control is considered critical in manufacturing and processing industries. ISO certification is a vital component to realize quality control in an organisation. This tool consists of various standards that are considered as key in dictating how organisations should conduct business to ensure they produce

superior products and services. Organisations must comply with these standards in order to achieve quality and effectiveness (Green et al., 2012). ISO certification as a universal set of standard that organisations should comply with to realize quality performance, especially manufacturing and processing firms certified by ISO, their management techniques must be reviewed, they should and have clear job specifications and description, the organisational manuals should be of high quality. These processes give organisations the opportunity to develop quality budget that is aimed at achieving high-quality products and services (Foster & Jonker, 2011). ISO certification seeks to prevent nonconformities; comprehensive program is required for all manufacturing firms that apply for certification. ISO certification seeks to review and document management procedures, prepare a quality manual that stipulate all process, creating job descriptions starting with the most basic and adding all the details, and submitting of periodic standards checks by an external body. The entire process enables the manufacturing firms to be awarded certification, an emblem to emphasis the firm's commitment to provide products and services that are of quality (The European Quality Award, 1994).

2.3.4 Six Sigma

Six Sigma is an approach that is utilized by processing and manufacturing firms for purposes of enhancing quality development. This approach seeks to manage waste and improve efficiency. Additionally, it is significant in error management. It manages errors arising from the organization not being consistent with their operations and also errors emerging from inefficiencies from the organization's activities (Anderson & Shroeder, 2004). It helps for example, the organization to prevent unnecessary costs resulting from absolute stocks (Davenport, Jerry & Tang, 2006). The technique of achieving quality products and services is through quality

awards. The award is given to the organizations put their efforts towards achieving optimum quality goods and services to the customers and other stakeholders (Deming & Juran, 1989). Good image of an organization is created through the Quality award, which enhances customer's trust towards the organization through the assurance of getting quality goods and services. This process helps the organization in winning the trust of their stakeholders and achieving customer satisfaction (Green *et al*., 2012).

Organizations must work very hard to achieve this award, both large and small organizations, through confirmation with set standards for achieving high quality. This organization must inspire their employees and educate them on the importance of quality improvement within and outside the organization (Crosby, 1999). 'Poka Yoke', is a Japanese word for another method used by the processing and manufacturing companies to achieve greater quality. It is a technique used to prevent error occurrence (Crosby, 1999). It is the process used to avoid and solve mistakes arising from the organization. This method is commonly used buy newly emerging firms as a way of barring mistakes from occurring deliberately. Smaller firms find it easy to use this technique due to their small business size in order to enhance the quality of their products and services (Beard and Thomas, 2007).

2.4 Operational Performance

Operational performance (OP) is an assessment of a firm's performance against efficiency measures and environmental responsibility that entails compliance with the regulation, cycle of time and minimization of waste. Operational performance involves aligning business units in a manner that is useful to realize set goals. In operational performance, the firm has to define its corporate strategy, identity operational performance goals and accommodate changes in the environment. The

key measures of operational performance include speed, costs, dependability, quality and flexibility. These measures of OP play a critical role in determining the organisation's efficiency in delivering intended products to generate sales. Quality measures the capability of the firm to produce products and services that satisfy customer specifications. Cost objective aims at understanding the level of variation that exists in product unit costs that is measured using product volumes. Products of different varieties and unique attributes record lower volumes and high costs.

Flexibility entails operations that might change the product lines to cope with certain requirements including adjusting those product lines faster to new requirements. Lastly, the operational objective of dependability serves in measuring how dependable the organization is on matters of timely delivery of products to its client based on the associated costs and prices

2.5 Empirical Studies

Ross, Peter and Robert (2011), implementation of SQM practices helps in minimising process inconsistency which directly affect supply chain performance measures such as process duration and delivery dependability. Quality management practices allows improved schedule attainment and faster response to market demands due to set-up time reduction. To a great extent, this aids in synchronizing the entire production network.

Davood *et al.* (2013), SQM requires that customer needs are satisfied as processes are followed. Supply chain management improves the long term performance of the individual firm and the supply chain network as a whole into an interrelated and high-performing business model through effective integration of suppliers, manufacturers,

distributors and customers as they implement set of practices and approaches. (Chandra & Kumar, 2000).

Proper implementation of SQM practices leads to fewer defects; through reduction in the amount of inventory in the supply chain. The ‘good’ units are moved by supply chain members as the 'defective' units are rejected. Quality management practices have a direct impact on supply chain performance measures such as inventory and time measures though reduction in process variance (Chen & Paulraj, 2004).

Burt, Dobler and Starling (2003), a vital factor between the relationship of suppliers and customers in a company is quality. There is a positive relationship between supply chain management and quality management. Quality management aids in reducing process variation that directly impact on several supply chain performance measures. Flynn and Flynn (2005) contend that with persistent quality management improvement; process and production variation, defects are decreased. As consistency within the supply chain progresses due to the variety diminishment, cycle times are decreased and the time between two progressive replenishments and on-time delivery improves.

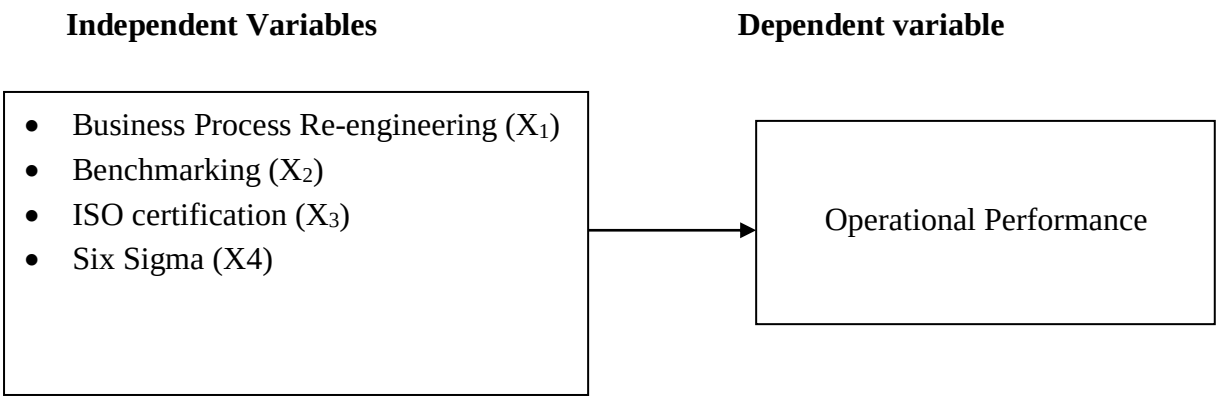
2.6 Summary of the Literature Review

In the reviewed literature, it is clear SQM is primarily intended to address the quality needs of the customers by embracing quality principles and practices. Quality management activities are long-term strategic goals that seek to achieve quality sustainability and continuous quality improvement. Effective use of SQM practices have been found to impact positively on operational performance as demonstrated by the following studies (Oriare, 2011; Mwai, 2015; Nzioka, 2016). This argument is also supported by the aforementioned theories anchoring this research.

2.7 Conceptual Framework

Figure 2.1 shows the theorized relationship between SQM and operational performance. Independent variables are business process re-engineering, benchmarking, ISO certification and Six Sigma. The dependent variable is operational performance.

Figure 2.1: Conceptual Framework



Source: Own compilation (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives a discussion of the research methodology that was used by the researcher to achieve the research objective. It covers the design of this research, study population, data collection procedure and data analysis approach.

3.2 Research Design

A descriptive survey was adopted. With this kind of a study, information was obtained to achieve the underlying objectives. Descriptive survey research design was considered appropriate since it enables the researcher to investigate existing relationships between variables. This argument was also supported by Cooper and Emory, (1995), who indicated that a survey is applicable when the population is small hence the researcher is able to study all the elements of a population.

3.3 Study Population

A population comprised of a collection of objects those posses' similar traits that can be used to make inference (Kothari, 2011). The target population for this study included seven (7) cement manufacturing firms that were operational as at 31st December, 2017 as presented in Appendix II.

3.4 Data Collection

The study used primary raw data that was collected through drop and pick self-administered semi-structured questionnaire. The questionnaire that was designed to elicit specific responses for quantitative and qualitative analysis. The questionnaires had three parts. The first section contained questions on the general information about

cement manufacturing companies and the respondents, and the second part contained questions on the SQM practices used by cement manufacturing firms.

The third part which had two sections contained questions on the influence of SQM practices on operational performance of cement manufacturing companies in Kenya. The respondents for this study included the finance managers, quality assurance managers and operations managers. Operations and quality assurance managers gave information on SQM and the finance managers provided information on operational performance. The choice of this category of respondents was because they are directly or indirectly involved in decision making on matters of SQM practices and operational performance.

3.5 Data Analysis

Data was analysed using both descriptive statistics and inferential statistics. The first objective was analysed using descriptive statistics and the second objective was analysed using regression analysis. Descriptive statistics include mean and standard deviation. Inferential statistics especially regression analysis was used to determine the link between SQM and operational performance of cement manufacturing firms in Kenya. The model for regression comprised of four independent variables: business process-re-engineering, benchmarking, ISO certification and Six Sigma. The dependent variable was operational performance of cement manufacturing firms in Kenya.

$Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+\varepsilon$

Where;

Y= Operational Performance (dependent variable)

b_0= constant

b_1……b_4 =coefficients

X_1 = Business process re-engineering

X_2 = Benchmarking

X_3 = ISO certification

X_4= Six Sigma

ε = error term

CHAPTER FOUR
DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides a discussion of findings based on the respondents' feedback and research objectives. Questionnaires were utilized to seek several attributes of SQM practices and operational performance of cement manufacturing firms in Kenya. The chapter covers descriptive statistics.

4.2 Response Rate

A census was carried out involving seven (7) cement manufacturing firms which are licensed by KAM as at 31st December, 2017. A total of 21 questionnaires were administered to the respondents and out of these, 20 questionnaires were filled to completion and returned successfully and this denoted a response rate of 95.24%, which in line with Fowler (1984) is representative.

4.3 General Information

This section discussed the respondents' demographics that included social traits such as the duration of operation of cement manufacturing firms, respondents' position and length of service which could possible affect SQM and OP of cement manufacturing firms.

4.3.1 Period of Operation

The respondents were asked to indicate the duration that cement manufacturing firms had been in operation and the respondents pointed out that all cement manufacturing firms had been in operation for a duration exceeding 10 years.

4.3.2 Position in the Organisation

The respondents were requested to specify the position that they held at cement manufacturing firms to find out if they were in a position to provide accurate and reliable information as per the objectives of the study.

Table 4.1 Position in the Organization

Position	Frequency	Percent
Quality manager	7	35%
Finance manager	6	30%
Operations manager	7	35%
Total	20	100.0

Source: Research data

The results in Table 4.1 showed that 35% of the respondents were quality managers, 35% of the respondents included operations managers and 30% respondents were operations managers. These imply that most of the respondents worked as middle level managers.

4.3.3 Length of Service

The respondents were asked to indicate the duration that they had served in their recent position in cement manufacturing firms. The outcome is outlined in Table 4.2.

Table 4.2: Length of Service

Period	Frequency	Percent
Less than 5 years	5	25%
5-10 years	11	55%
10-15 years	4	20%
Above 15 years	1	5%
Total	20	100.0

Source: Research data

The outcome in Table 4.3 revealed that (55%) of the respondents served in their current position for duration between 5-10 years, 25% of the respondents served for duration of less than 5 years, 20% respondents served for a duration between 10-15 years while only, 5% served for more than 15 years in their current positions. This imply that majority of the respondents had acquired relevant experience concerning SQM practices and OP.

4.4 Strategic Quality Management (SQM) Practices

SQM practices were considered as independent variable under this study. The study considered the need to establish the respondents' views with regard to use of SQM practices in the organisation. SQM practices were evaluated on a 5-point Likert scale, and it was anticipated that the respondents would either agree: "to a very large extent", "large extent", "moderate extent", "little extent", or "Not at all".

For each question, the response that represented a positive response to these practices got allocate 5 points, then 4, 3, 2, and 1 for the least positive respectively. A mean score of ≥ 4.5 implied that the respondents agreed to a very large extent; $3.5 \leq 4.5$ implied that the respondents were in agreement to a large extent; $2.5 \leq 3.5$ implied that the respondents were in agreement to a moderate extent; 1.5 to ≤ 2.5; implied that the

respondents were in agreement to a little extent, and a score of ≤ 1.5 was taken to mean that the respondents failed to agree completely. A SD of ≤ 1 meant that the respondents had the same perception in rating a statement while SD exceeded 1; it implied that the respondents failed to agree on a statement. A total of 19 statements were used in evaluating the use of SQM practices amongst cement manufacturing firms.

4.4.1 Business Process Re-engineering

The respondents were requested to indicate the extent to which they concurred with certain aspects of business process re-engineering in their organisations with the help of four statements.

Table 4.3 Business Process Re-engineering

Business Process Re-engineering	**Mean**	**SD**
The organisation has made processes efficient to reduce costs	4.45	0.57
The organisation conducts regular audits to boost effectiveness of SQMs programs	3.82	0.74
The organisation tailor its products to meet customer specifications	3.79	0.71
The organisation does not consider technology to be costly since its benefits are normally overrated	3.29	0.52
N=20: Mean Score	3.84	0.64

Source: Research data

The results outcome displayed that to a very great extent (mean of ≥ 4.5), the organization made processes efficient to lower costs (4.45). To a great extent (mean of 3.5≤ 4.5), the organization; conducted regular audits to enhance effectiveness of SQMs programs (3.82), customized its products to meet the expectations of the customers (3.79) and did not deem technology as costly because the benefits are usually overrated (3.29). The mean score was 3.84 standard deviation of 0.64, this

was an indication that cement firms practice business process re-engineering to a great extent.

4.4.2 Benchmarking Practices

The respondents were requested to indicate the extent to which benchmarking practices were used; the outcomes are shown in Table 4.4.

Table 4.4 Benchmarking Practices

Benchmarking practice	**Mean**	**SD**
The organisation compares its progress to other organisations in terms of product quality, utility processes and operations	3.81	0.54
The organisation evaluates its performance using performance standards benchmarking processes	4.46	0.86
Benchmarking motivates the organisation to perform better	3.51	0.64
The organisation compare itself with the best performing organisation in the industry	4.10	0.83
Through benchmarking the organisation is able to gain access to vital information	3.56	0.67
N=20: Mean Score	3.89	0.71

Source: Research data

The findings established that to very great extent (mean of ≥ 4.5), the organisation assessed its performance using benchmarking processes. To a great extent (mean of 3.5≤ 4.5), the firm; compared itself with the best performing firm in the industry (4.10) and also, it compared itself against its rivals in terms of quality of product, operations and processes (3.81). Similarly, it was further discovered that to a great extent that the organisation gained access to critical information through benchmarking (3.56) and that this motivated the organisation to perform better (3.51). The general mean score was 3.89 and standard deviation of 0.71, which was an indication that cement firms, employed benchmarking to a great extent.

4.4.3 International Standardization Organisation (ISO) Certification

The study sought to establish the procedures of ISO certification that were employed by cement manufacturing firms and the results are indicated in Table 4.5.

Table 4.5 ISO Certification Practices

ISO Certification	Mean	SD
The organisation adopts self-declare conformance	3.92	0.64
The organisation has a duty to meet customer requirement	3.72	0.66
The organisation is responsive to market needs	4.01	0.84
The organisation maintains customer satisfaction	3.52	0.63
N=20: Mean Score	3.79	0.69

Source: Research data

The findings disclosed that to a large extent (mean of $3.5 \leq 4.0$), the organisation: was responsive to customer needs (4.01), applied self-declare conformance (3.92), and is obligated to satisfy all customer requirements (3.72) and to meet their satisfaction (3.52). The mean score was 3.79 which indicate that most firms embraced ISO certification processes to a great extent.

4.4.4 Six Sigma Practices

The respondents were requested to show the degree to which six sigma practices were utilized. The results are shown in Table 4.4.

Table 4.4 Sig Sigma Practices

Six Sigma Practice	Mean	SD
The organisation minimizes wastes to minimize costs	4.47	0.44
The organisation focuses on excellent customer services	3.69	0.66
The organisation delivers its products and services timely	3.54	0.84
The organisation records minimal delays in innovations for process improvement	3.89	0.63
The organisation maintains time performance	3.42	0.81
N=20: Mean Score	3.80	0.68

Source: Research data

The findings disclosed that to a very great extent (mean of ≥ 4.5), the organisation minimized waste so as to reduce costs. To a large extent (mean of 3.5 ≤ 4.0), the organisation: recorded very little delays in innovations for process improvement (3.89), concentrates on exceptional customer services (3.69), is keen in ensuring timely delivery of products and services (3.54) and observes time performance (3.42). The mean score was 3.80 which was an indication that most cement manufacturing firms' embraced Six Sigma practices.

4.5 Challenges of Implementing SQM practices

The study sought to establish the challenges that cement manufacturing firms experienced in the implementation of SQM practices. The outcomes are illustrated in Table 4.5.

Table 4.5 Challenges of Implementing SQM Practices

Challenges	Mean	SD
Training and development programs	4.48	0.55
Finances	4.10	0.54
Inadequate top management support	3.66	0.91
Employee turnover	3.92	0.72
Resistance to change	3.89	0.65
N=20: Mean Score	4.01	0.70

Source: Research data

The output in Table 4.5 reveals that cement manufacturing firms did not sponsor their employees to training and development programs as evident by a mean of 4.48 and SD of 0.55 (<1.0), implying that these statement was supported by the respondents. The second challenge was finances as revealed by the respondents through a mean of 4.10 and SD of 0.54 (<1.0); these signalled that these response was largely applauded by the respondents. The third challenge as revealed by the respondents was employee turnover which attained a mean of 3.92 and SD of 0.72 (<1.0). Other challenges that hindered implementation of SQM practices were resistance to change and lack of enough support from the top management. The mean values were 3.89 and 3.66 respectively; standard deviations were 0.65 and 0.91 respectively, which was an indication that these statements were approved by majority of the respondents.

4.5 The Relationship between SQM practices and OP

To achieve the second research objective which was establishing the link between SQM practices and OP of cement manufacturing firms, the researcher adopted a regression model. The researcher regressed OP (using time indicators) against SQM

practices since it generated significant values as compared to cost and quality indicators and the results are as follows:

Table 4.6: Summary of Output

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.772a	.654	.498	.0251

a. Predictors: (Constant), business process re-engineering, benchmarking, ISO certification, Six Sigma

The findings showed that the coefficient of determination showed 65.4% variance in OP. These imply that the regression equation used in the study fits the data and thus a satisfactory predictor.

Table 4.7 Analysis of Variance

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.080	4	.52	.765	.000[a]
	Residual	10.129	15	.68		
	Total	12.209	19			

Analysis of variance depicted that the overall regression model adopted in this study was significance because its p-value was less than 5%, (0.000).

Table 4.8 Model Coefficients

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std error	Beta		
(Constant)	.049	.014		0.064	.139
Business process re-engineering	.053	.012	.600	2.536	.000
Benchmarking	-.060	.040	-1.131	-0.658	.108
ISO certification	.056	.030	.372	2.205	.001
Six Sigma	.068	.003	.721	1.199	.023

a. Dependent variable: Operational performance

Business process re-engineering, ISO certification and Six Sigma were positively linked to OP (0.053, 0.056 & 0.068, respectively). This shows that a unit increase in each of these variables will lead into a corresponding increase in OP. Benchmarking was negatively related to OP (-0.060), meaning that a unit increase in this variable will result into a corresponding decline OP.

Significance (Sig.) implies that either one or more predictor variables confirm that there is a relationship amongst variables: SQM practices and OP. Business process re-engineering, ISO certification and Six Sigma were found to be significant because their p-values were smaller than 5%, (0.000, 0.001 & 0.023). Benchmarking was insignificant as revealed by its p-value which was greater than 5%, (0.108), this was an indication that this variable did not detect existence of any relationship between SQM practices and OP.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study provides a summary of major study findings which have been done in line with the objective of this study which was establishing the link between SQM practices and OP of cement manufacturing firms in Kenya. The other sections that have been discussed in this study include the conclusion, recommendations and areas for future investigation.

5.2 Summary of Findings

Based the use of SQM practices, the findings showed that business process-engineering, benchmarking, ISO certification and Six Sigma were used to a large extent by cement manufacturing firms. These findings are consistent with a study by Davood et al. (2013) that established that SQM practices: business process re-engineering, Six Sigma and ISO certification were utilized to a large extent.

In regard to the link between SQM and OP, it was established that the regression model adopted in the study was a reliable predictor. These results are consistent to Nzioka (2016), whose regression model was found to be a satisfactory predictor. The results further revealed that the entire regression equation adopted in this study was significant. These findings conform to a study by Mwai (2015), who found established that the regression equation used was statistically significant. Business process re-engineering, ISO certification and Six Sigma were positively associated to OP.

These results abide by the recommendations of Mwai (2016), who revealed that ISO certification and Six Sigma were positively related to OP. Contrary to this,

benchmarking was inversely linked to OP. These findings contradict the views of Nzioka (2016), who established that benchmarking practices were positively linked to OP. It was further revealed that business process re-engineering, ISO certification and Six Sigma were significantly linked to OP, these findings agree with the observations of Nzioka (2016), who concluded that ISO certification and Six Sigma were significantly linked to OP. Benchmarking was insignificantly linked to OP, these results are contrary to the observations of Oriare (2011).

Concerning the challenges that inhibited implementation of SQM practices by cement manufacturing firms, the findings discovered that lack of training and development programs, finances and inadequate support from the top management were leading challenges that created a 'stumbling block' towards successful implementation of SQM practices. These findings are consistent to a Mwai (2015) and Nzioka (2016), who established that training and development programs, employee turnover as the underlying challenges that created an impediment towards successful implementation of SQM practices. It was further established that there was resistance to change among some employees and limited support from the top management. These findings are in line with the observations of Mohammad and Arshad (2013), who indicated that resistance to change and inadequate support from top management limited successful adoption and implementation of SQM practices.

5.3 Conclusion

The study concludes that the most popular SQM practices used by cement manufacturing firms included business process re-engineering, benchmarking, ISO certification and Six Sigma. It was established that SQM practices were used to a great extent implying that these practices had been accepted and thus embraced by most cement manufacturing firms. These practices were used to improve the quality

of products, reduce waste and costs, ensure on-time delivery of products and services and reduce lead time.

With regard to the second objective of this study which was establishing the link between SQM and OP of cement manufacturing firms, the results of regression analysis established that the regression model used in the study was a good fit for the data; a reliable predictor. These findings are consistent to the observations of general regression model was found to be statistically significant. It was further established that business process re-engineering, Six Sigma and ISO certification were positively and significantly linked to OP while benchmarking was negatively and insignificantly linked to OP.

Finally, the study concluded that the most critical challenges that faced cement manufacturing firms in implementation of SQM practices were failure by top management to sponsor employees in training and development programs, inadequate finances, employee turnover, resistance to change and inadequate support from top management. These resulted into inefficiencies and increased costs and thus derailing SQM practices implementation.

5.4 Recommendations

The study recommends that cement manufacturing firms should practice internal benchmarking to boost OP in different departments at the work place. Thus, this is easier and convenient for departmental managers to borrow some of the best practices from a department; this may result into an improvement in performance of all the departments.

Secondly, cement manufacturing firms should sponsor their employees to a continuous training and development program to develop skills and knowledge on

SQM practices. This will sharpen employees' skills and increase their knowledge, and thus improve their morale and efficiency in implementation of SQM practices.

The top management of cement manufacturing firms should provide enough support in form of resources and facilities to provide an enabling environment for employees to participate in implementation of SQM practices.

Finally, KAM should set policies that encourage cement manufacturing firms to embrace SQM practices in all their business dealings. This will promote healthy competition among cement firms and enhance consumer protection.

5.5 Limitations for the Study

Due to time limitation and resource constraints; the researcher was limited in scope hence the findings obtained are limited to cement manufacturing firm. Hence, the findings cannot be utilized to generalize the whole manufacturing sector in Kenya.

The researcher has no control over data collection. Few respondents failed to complete filling up the questionnaires and one of them completely declined to fill in the questionnaires citing busy work schedules as the main reason.

5.6 Suggested Areas for Further Research

In future, researchers should do a facsimile of this study to cover the whole manufacturing industry and other quality management approaches that can be used, this way; they can achieve more accurate and reliable findings and a detailed review on the nature of the relationship between variables. Findings got from this study will be compared upon which a more plausible conclusion may be drawn.

Additionally, a duplicate of this study needs to be conducted in other countries particularly in Sub-Saharan region; this will help in establishing the universality and relevance of SQM practices and its effect on OP.

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APPENDICES

Appendix I: Research Questionnaire

Introduction

This questionnaire is designed for the sole purpose of collecting data on Strategic Quality Management (SQM) practices and operational performance of cement manufacturing firms in Kenya. The collected data will be treated with a high degree of privacy and meant for academic purposes only.

PART A: GENERAL INFORMATION

1. How long has your organisation been in operational in the cement industry in Kenya?

a) Less than 10 years [ ]

b) More than 10 years [ ]

2. What is your position in this organisation?

a) Head of Operations/Plant manager [ ]

b) Finance Manager [ ]

c) Supply Chain Manager [ ]

d) Quality Manager [ ]

3. How long have you been in this position?

a) Less than 5 years [ ]

b) Between 5 to 10 years [ ]

c) Between 10 to 15 years [ ]

d) Above 15 years [ ]

PART B: EXTENT OF USE OF STRATEGIC QUALITY MANAGEMENT (SQM)

4. Please indicate the extent to which SQM practices are used in your organisation. Use the following rating: Tick appropriately. 1-Not used 2-Small Extent 3- Moderate extent 4-Great Extent 5-Very great extent

		1	2	3	4	5
	Business Process Re-engineering					
1.	The organisation has made processes efficient to reduce costs					
2.	The organisation conducts regular audits to boost effectiveness of SQMs programs					
3.	The organisation tailor its products to meet customer specifications					
4.	The organisation does not consider technology to be costly since its benefits are normally overrated					
	Benchmarking					
1.	The organisation compares its progress to other organisations in terms of product quality, utility process and operations					
2.	The organisation evaluates its performance using performance standards benchmarking processes					
3.	Benchmarking motivates the organisation to perform better					
4.	The organisation compares itself with the best performing organisation in the industry					
5.	Through benchmarking the organisation is able access important information on organisations that do not compete					
	International Standardization Organisation					
1	Is your organisation ISO certified? Yes or No, if yes, indicate to which extent.					
2.	The organisation adopts self-declare conformance					
3.	The organisation has a duty to meet customer requirement					
4.	The organisation is responsive to market needs					
5.	The organisation maintains customer satisfaction					
	Six Sigma Practices					
1.	The organisation eliminates wastes to minimize cost					
2.	The organisation is concerned with excellent customer services					

3.	The organisation delivers its product and services timely					
4.	The organisation records minimal delays in innovations for process improvement					
5.	The organisation maintains time performance					

PART 3 (SECTION A) CHALLENGES INVOLVED IN THE IMPLEMENTATION OF SQM Practices

5. (a). List some of the challenges faced by your organisations in the implementation of SQM practices?

……

……

……

b). Please indicate from the list of challenges that you have given above which are the most popular challenges faced by your organisation in the implementation of SQM practices

……

……

c). Please explain in detail how the above challenges impede implementation of SQM practices in your organisation.

……

……

……

PART 3 (SECTION B) OPERATIONAL PERFORMANCE

6. Kindly provide approximate figures on the parameters outlined in the table below.

Criterion	**Unit of Measure**	**2015**	**2016**	**2017**
Sales (cost)	Kshs. (m)			
Total average inventory (time)	No.			
Reduction in unit costs (cost)	Kshs. (m)			
Inventory cost (cost)	Kshs. (m)			
Inventory turnover ratio (time)	%			
Order lead time (time)	Days			
Range of products (time)	No.			
Cost efficiency (cost)	%			

7. Kindly indicate in percentage form the extent to which automation, safety measures & ISO standard certifications were used within the organisation between 2015 and 2017.

Criterion	**Unit of Measure**	**2015**	**2016**	**2017**
ISO standard certification (Quality)	%			
Automation (Quality)	%			
Safety measures (Quality)	%			

THANK YOU ALL FOR PARTICIPATING

Appendix II: Cement Manufacturing Firms in Kenya

1. Bamburi Cement Limited
2. East African Portland Cement Company
3. Mombasa Cement Limited
4. National Cement Company
5. Athi River Mining Limited
6. Savannah Cement Limited
7. Ndovu Cement

Source: (KAM, 2017)