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**The Influence Of Contractor Relationships On Total Quality Management
Practices In The Construction Industry In Kenya**

Njenga Robert Chege

079162

**Thesis submitted in partial fulfillment of the requirements for the Degree
of Master of Commerce at Strathmore University**

**School of Management and Commerce
Strathmore University
Nairobi, Kenya**

May, 2017

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Njenga Robert Chege

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7th June 2017

Approval

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ABSTRACT

This study investigated the influence of contractor relationships on total quality management practices in context of the Kenyan construction industry. The study was guided by five specific objectives: to establish total quality management practices among contractors in the Kenyan construction industry; to analyze influence of contractor-client relationship on total quality management practices among contractors in the Kenyan construction industry; to analyze influence of contractor-subcontractor relationship on total quality management practices among contractors in the Kenyan construction industry; to analyze influence of contractor-supplier relationship on total quality management practices among contractors in the Kenyan construction industry; to examine barriers to total quality management practices among contractors in the Kenyan construction industry. The study was premised on Juran's, Deming's and Six Sigma theories on total quality management. This study applied a cross-sectional research design. The target population for the study is 5,777 contractors as registered by the National Construction Association (NCA) in Nairobi County. The sample size was established at 197 contractors. The study adopted stratified random sampling procedure. A structured questionnaire was used to collect data for the study. Data analysis techniques used were central tendency (mean, standard deviations, percentages), correlation and regression analysis using SPSS Version 22. The data was presented in tables and charts and researcher's interpretation. The findings showed that contractor-client relationships had the most significant effect on TQM practices, customer focus and management was the most practiced TQM principle and procedural barriers are a hindrance to TQM practices in the construction industry in Nairobi County. The study concludes that contractor relationships have a positive effect on TQM practices in the Kenyan construction industry. The study recommends that customer focus and management should be the focus of contractors in practicing total quality management in their work. Through collaborating and cooperating with the client during the construction process means that contractors can be able to meet the client quality requirements thus achieving total quality management.

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DEDICATION

To my dear wife Nelly Ngina, my beloved mother Susan Wambui Njenga and siblings Wanjiku and Muthoni. Thank you for your prayers and continuous support during this journey.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The business environment today has forced firms to provide goods and services that continue to meet and exceed customer expectations and needs to achieve a sustainable competitive advantage (Muma, Nyaoga, Matwere & Nyambega, 2014). According to Oruma, Mironga and Muma (2014), Total Quality Management (TQM) is one of the management approaches that organisations can adopt to be able to achieve continuous quality improvement in the operations and meet customer needs and expectations. The history to TQM philosophy can be traced back to the 1970s when the focus of quality took a significant direction from quality control to a long term approach of quality to address the quality concerns in business. Quality management through the years has evolved to quality control from quality inspection to quality assurance and then finally to TQM (Kenya Institute of Management, 2009).

1.1.1 TQM Definition

There is no consensus on the definition of quality with different definitions being given by quality management experts. According to Deming (1986), quality is a predictable degree of uniformity and dependability, at low cost and suited to the market. Juran (1992) defined quality as “fitness for use” and focused on a trilogy of quality planning, quality control, and quality improvement. Crosby (1989) defined quality as “conformance to requirements or specifications”. According to Crosby, requirements are based on customer needs (Kruger, 2001). Garvin (1987) defined quality in terms of the transcendent, product based, user based, manufacturing based and value based approaches.

There has also been a difference in opinion on the principles of TQM over the years and what it comprises of among TQM experts. Kruger (2001) found that Crosby (1989), defined TQM as relying on a zero defect quality improvement plan that seeks to achieve performance improvement in the firm.

Garvin (1987) identified and proposed eight principles that can be used to measure the quality of products. Deming (1986) defined TQM in terms of 14 principles of quality management to enhance performance and productivity of the firm. Saraph, Benson and Schroeder (1989) TQM study came up with 78 quality management items which were distinguished into 8 critical factors for measuring TQM performance in the firm. Flynn et al. (1994) study developed seven quality factors that determined the critical determinants of TQM. Black and Porter (1996) research found several critical factors of TQM which were categorized into ten critical factors. Ahire, Golhar and Waller (1996) identified and developed 12 integrated quality management items by conducting a detailed literature review to establish the critical quality management factors in organisations.

1.1.2 Contractor Relationships

The contractor relationships are an important variable in the construction industry. The construction industry is unique due to the contractual relationships that exist in a construction project. Contractor relationships refer to the relationships and partnering that a contractor gets into with different stakeholders in the construction project. These stakeholders include the client/owner, suppliers and subcontractor (Harrington, Voehl & Wiggin, 2012).

Studies have shown that contractor relationships have an effect on successful completion of projects. Enhassi, Mohamed and Abushaban (2009) confirmed that continuous coordination and relationships between project participants are required through the project life cycle in order to solve problems and improve project performance. Several researchers (Kazemi, 2016; Karaman & Kale, 2012; Mirawati, Othman & Risyawati, 2015), have supported the argument that construction projects and their success rely on contractor-client relationship, contractor-subcontractor and contractor-supplier relationships.

The relationship between client and contractor in construction constitutes a multilevel complex network in which parties operate simultaneously and collaborate.

Cooperation between client and contractor is strongly emphasized that the customer's input has considerable implications in the outcome of the construction project (Homburgh & Rudolph, 2001). Contractually, main contractors are responsible for the construction of projects, but they rely on subcontractors and/or specialist contractors and suppliers to execute the works as they may not have the required skills and expertise of the works involved (Clarke & Herrmann, 2007). Generally, 85% of construction projects are implemented by subcontractors (Mirawati, Othman & Risyawati, 2015). In a construction project, there are several services, goods and materials that required for successful completion of a project. This means that there are suppliers who provide these inputs in an ongoing construction projects. A contractor-supplier relationship is the cooperation and collaboration of the contractor with organizations and persons that provide required supplies in the project (Mirawati et al., 2015).

Total Quality Management is increasingly been adopted by construction companies as an initiative to solve quality problems and to meet the needs of the final customer (Kheni & Ackon, 2015). According to Hoonakker et al. (2010) most of the research concludes that it is necessary to transpose and translate the principles, practices and techniques used for TQM in manufacturing to construction. However, studies show that the construction industry is being viewed as one with poor quality emphasis compared to other sectors like the manufacturing and service sectors (Alotaibi et al., 2013; Jung, Wang & Wu, 2009).

There are several benefits that TQM practices can bring to the construction industry, in their study, Polat, Damci and Tatar (2011) study indicated that some of the potential benefits of TQM practices in the construction industry includes: increased market share, a reduction in resources wastage, improved customer satisfaction, customer loyalty, better budget performance, a reduction in costs of poor quality, improved chances to win local and foreign contracts, better tendering prospects, realisation of organisation vision, mission and strategic objectives, increase in competitive advantage, better relationships with subcontractors, clients and suppliers, a reduction in nonconformities, improved schedule performance and reduced rework rates (Polat et al., 2011).

1.1.3 Contractor relationships and TQM practices

Polat et al. (2011) study affirmed that TQM practices in the construction industry lead to improved relationships with architects, engineers and subcontractors. Harrington, Voehl and Wiggin (2012) argued that failure to involve suppliers, subcontractors, and others in the process chain creates a major difficulty in implementing TQM. Suganthi et al. (2017) study also found that supplier related factors had an effect on TQM implementation in the construction industry. The contractor-client relationship has been shown to influence TQM practice to meeting and exceeding the demands of the clients as a measure of quality. Ke et al. (2013) found that higher quality of relationships during project implementation stage always leads to significantly good project quality and client satisfaction with the project.

Pheng and Ke-Wei (1996) explain that staff of subcontractors is at times critical of the contractors' quality initiatives and this is due to poor contractor-subcontractor relationships. The contractor through an effective relationship with subcontractors can introduce TQM practice to subcontractors' workers. In regard to the influence of contractor-supplier relationship on TQM practice, Harrington et al. (2012) opined that maintaining close and long-term relationships with suppliers' results in achieving the best economy and quality. Deming (1986) emphasized the importance for contractors to build and maintain special relations with suppliers by ending the practice of awarding business on the basis of price tag alone. Instead, contractors should seek to minimize total cost by working with a single supplier.

1.1.4 TQM Barriers

Despite the recognition on the importance of TQM practices in the construction industry, there are barriers that are hinder successful TQM practices in construction industry. These barriers include: lack of continuous skills and proper training among construction staff, transient nature of workforce in construction companies, multiple stakeholders with conflicting interests, too much documentation, employee interest in TQM practices, lack of leadership in TQM practices, creating and maintaining team spirit for TQM practices,

low bid subcontracting and difficulty in measuring results (Haupt & Whiteman, 2003; Chin-Keng & Hamzah, 2011; Kazemi, 2016).

Arshida and Agil (2012) identified TQM practices barriers to include: government regulations, slow systems and bureaucracy, poor leadership which leads to poor staff motivation and empowerment, lack of favourable quality policies, lack of top management commitment to TQM, low government support for quality programs, weak organisational plan statement, vision towards quality improvement and lack of critical resources for quality management in the organisation (Arshida & Agil, 2012).

1.2 The construction industry in Kenya

The Ministry of Public Works and the National Construction Authority (NCA) are the government agencies that are mandated to oversee the operations of the construction industry in Kenya. The national construction authority oversees the construction projects in infrastructure and buildings. The major constraints to the performance of construction companies in Kenya are quality standards, meeting customer demands and financing according to the Kenya Private Developers Association. All construction activities in Kenya are regulated by the National Construction Authority which was established by the National Authority Construction Act of December, 2011 (National Construction Authority, 2016). Through the act, the authority is charged among other things without prejudice with ensuring and promoting quality assurance in the construction industry and encouraging the standardization and improvement of construction technique and materials.

The construction industry is a strategic industry playing a significant role contributing to the most vibrant and fastest growing economy in the East African Community. The industry has maintained rapid growth in 2014 at 13.1 % growth as compared 5.8 % growth in 2013. The growth is driven by a vibrant real estate sector and on-going mega infrastructure, key among them the Standard Gauge Railway (SGR) between Mombasa and Nairobi, construction of roads and energy infrastructure, and expansions of airports.

The construction industry contributed 4.5 % and 4.8 % to GDP in 2013 and 2014 respectively, ranking third behind agriculture and government services in terms of economic importance (Kenya National Bureau of Statistics, 2015).

The construction industry in Kenya is suffering from poor quality results. The construction industry faces challenges such as the most critical of which are include gross safety violations evidenced by a number of cases of buildings collapsing around the country. Dindi (2004) investigated quality management as a challenge for the Kenyan construction industry and confirmed that majority of building contracts in Kenya suffer cost and time overruns.

The construction industry in Kenya is estimated to be responsible for 27 % of fatalities and injuries to staff which in turn affected the completion rates of construction projects. Kwasira, Wambugu and Wanyoike (2016) researched approximated the completion rate among government sponsored construction projects to be 35.6%. Muiruri and Were (2016) observed that Nairobi County has seen an increase in cases of collapse of buildings which has been linked to inadequate quality management. This reports indicate that there is lack of quality management practices in the Kenyan construction industry and this affects the performance of the construction sector according to global standards.

1.3 Problem statement

Quality demand has become a significant demand from the ever growing number and knowledge of today's customers in the construction industry. The demands emanate from the increased structures that have collapsed in the country which had led to fatality and injuries. Several studies (Kibuchi & Muchungu, 2012; Githenya & Ngugi, 2014) have noted that the Kenya construction sector is facing a myriad of challenges in meeting quality standards and quality assurance due to substandard construction projects, unfinished projects and collapse of ongoing construction projects. There is need for quality management in the construction projects and this can be achieved by use of TQM practices by contractors in the construction sector.

There are several studies that have been conducted on the relationship between TQM and construction industry. Oruma et al. (2014) research focused on top leadership commitment on TQM practice among contractors in Nakuru County and confirmed that the commitment of top leadership has a significant influence on TQM practice in the construction industry.

The contractor relationships are an important component of the construction industry. The contractor is responsible to implement the work and enters into a relationships with the client, subcontractors for the different specialized works and suppliers for the construction project. These relationships also become important in achieving quality management in the construction process due to different parties and stakeholders. This research sought to investigate how the contractor relationships influence TQM practice in the construction industry in Nairobi County.

1.4 Research objectives

The general objective of the study is to analyze the influence of contractor relationships on total quality management practices in the construction industry in Kenya.

1.4.1 Specific Research Objectives

The specific objectives of the study were:

- i. To establish total quality management practices among contractors in the Kenyan construction industry.
- ii. To analyze influence of contractor-subcontractor relationship on total quality management practices among contractors in the Kenyan construction industry.
- iii. To analyze influence of contractor-supplier relationship on total quality management practices among contractors in the Kenyan construction industry.
- iv. To analyze influence of contractor-client relationship on total quality management practices among contractors in the Kenyan construction industry.
- v. To examine barriers to total quality management practices among contractors in the Kenyan construction industry.

1.4.2 Research Questions

The study aimed at answering the following research questions;

- i. What are the total quality management practices among contractors in the Kenyan construction industry?
- ii. What is the influence of contractor-client relationship on total quality management practices among the Kenyan construction industry?
- iii. What is the influence of contractor-subcontractor relationship on total quality management practices among the Kenyan construction industry?
- iv. What is the influence of contractor-supplier relationship on total quality management practices among the Kenyan construction industry?
- v. What are the barriers to implementation total quality management practices in the construction industry in Kenya?

1.5 Scope of the study

The study focused on the construction industry in Kenya from contractors' perspective. The study population encompassed all contractors registered with the National Construction Authority (NCA) in Nairobi region. The scope of the study to Nairobi County was influenced by the volume of construction projects that are being undertaken in the county.

1.6 Significance of the study

The study is of importance as it will contribute to the body of knowledge on the theoretical framework on TQM practice in the construction industry. There is less evidence of theoretical foundations of TQM practice in the construction industry compared to manufacturing and service sectors a gap that this study intends to fill. Secondly, the study uses quantitative methodologies to collect and analyse the data and this is useful for making recommendations for policy and also for practice. Third, the study is of significance as it engages contractors in the industry on the influence of their relationships on TQM practice in construction projects. The study is useful as it gives practical implications for stakeholders in the construction industry in Nairobi County.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature that was reviewed in relation to the extent of TQM implementation in the construction industry. The section first begins with the theoretical underpinning of the study with a view of TQM and the construction industry. Subsequent sections looked at the independent variables of the study which included: contractor relationships, TQM practices in the construction industry and finally barriers to TQM implementation in the construction industry. The conceptual framework was also drawn up.

2.2 Theoretical background

This section highlights theoretical models that have been used to study the concept of TQM in the construction industry. Oswald (2009) notes that there is no consensus on one model or theory of TQM which explains how quality management principles interact. There are several theories of TQM. These include: Deming's Theory, Ishikawa's Theory, Crosby's Theory, Juran's Theory, Six Sigma and The EFQM Framework. The study adopted Juran's theory (1993), Deming's theory (1986) and Six Sigma models of TQM which have been used in the construction industry by past studies.

2.2.1 Juran's theory

Juran (1992) argued that quality is about a product meeting a "purpose or fitness for use". Juran is associated with the quality trilogy which he proposed for organisation to achieve and maintaining quality management. This trilogy consists of quality improvement, quality planning and quality control. The trilogy stresses the developing and changing of quality management in a firm's top level management.

According to Juran (1992), quality planning comprises of designing a procedure that meets set goals. This process needs to determine goals, performing a resource plan, creating a quality plan and planning implementation. The quality control process involves amending and operating the process so as to attain highest effectiveness by monitoring

performance contrasting achievements made with set objectives and action to close any deviations. This process entails comparing the actual performance with the intended goals and in case there is a major discrepancy there are changes and adjustments to the system are performed to make sure the achievement of set goals. Quality improvement seeks to take the organisation performing to superior and new levels of customer satisfaction, enhancing employee morale, improving logistics, reduce waste and improving profitability.

2.2.2 Deming's theory

Deming's philosophy of TQM which was a basis for this study, combines a paradigm shift in management capability with statistical methods and thinking in the operations of an organization (Leonard, 2010). The 14 points of management, developed by Deming in 1950 is a set of management practices to help companies increase their productivity and quality. These 14 points are not static but keep on changing with the business environment.

These principles are: adopting and instituting leadership in the organisation, ending the culture of awarding jobs on the basis of pricing alone by minimizing total costs by working with a one supplier; creating a constancy of purpose to improve services and products; removing barriers to staff workmanship in the firm and also eradicating merit system or yearly ratings; adopting the TQM philosophy; driving out fear; constantly and continuously improve each process for production, service and planning; institutionalization of a vigorous training regime for self-improvement for all staff in the organisation; elimination of exhortations, targets and slogans for the staff; managing the process and not the outcome, breaking down barriers between departments and staff and eliminating numerical goals for management and numerical quotas for the workforce.

Deming's (1986) 14-point model has been practiced successfully in Japan and the United States (Walton, 1993) for the construction industry. According to Farooqui and Ahmed (2009), there are several principles which apply to the construction industry.

In this section, the study linked some of these principles to the construction industry in Kenya. The third principle argues that firms should manage the process not the outcome. Farooqui and Ahmed (2009) note that most construction firms focus on inspection of tasks completed in the construction project. Deming (1986) argues that firms should focus on improving the process rather than the outcome of the process. Githenya and Ngugi (2014) found that supervision is often conducted after completion of stages in the construction process.

The fourth principle focuses on the choice of the supplier. In the construction industry in Kenya the “lowest bidder” is often assumed to be the best fit for the construction job at hand. Deming (1986) argued that the choice for lowest bidder may not be the best quality supplier. He suggested that contractors should focus on the long-term relationship with the supplier. The seventh principle is significant to this study as it revolves around the idea of providing training and empowerment of staff. Deming (1986) insists on training and retraining of each employee. He believes that training will reduce the variation in the process. In their study, Farooqui and Ahmed (2009) found that 65 % of the companies responded that they provide training or retraining to their employees. There is need for construction firms to provide on-job training for staff on quality management.

Several studies (Huda, 2008; Farooqui & Ahmed, 2009) have used this model to discuss TQM implementation in the construction industry. Deming’s 14 principles provide a clear picture of how quality can be enhanced in organizations with the focus of this study being on the application of TQM in the construction industry.

2.2.3 Six sigma

Six Sigma began with the Six Step process of Motorola back in 1998 and evolved to be an extension of quality management techniques, especially Total Quality Management (TQM). The term Six Sigma was introduced by Motorola. Six Sigma has been used as a business initiative to change the culture, produce high-level results, expand all employees’ skills and improve work processes. Kwak and Anbari (2006) defined it as “a business strategy that aims to improve understanding of client requirements, financial

performance, and productivity and business systems. It is a staff centered system of management that operates by encompassing all staff, top to bottom as one unit (Mehmet, 2016).

In the last 20 years, six sigma has transformed become a flexible and adaptive business strategy, applicable to many aspects of business and organizations. In the construction sector, Six Sigma techniques are not about being thorough or having all procedures and items at Six Sigma levels of execution (Linderman et al., 2003), but they aim at improving the processes resulting into cost reduction (Brue, 2002). Tchidi et al. (2012) showed that Six Sigma principles were feasible in construction quality management. Six Sigma has the potential to improve processes in the construction industry. Mehmet (2013) opines that adopting six sigma in the construction sector consists of breaking down large project tasks into smaller tasks that can be improved and reengineered. The systematic and structured framework of six sigma along with the use of statistical approaches can contribute to an effective tool for process monitoring which is a significant task of modern construction managers.

The classic six sigma problem solving process is the Define-Measure-Analyze-Improve-Control (DMAIC). The approach is applied to a problem with an existing product or process and/or service offering. The DMAIC model is founded on three fundamental principles: (1) inherent combination of tools-tasks-deliverables linkage that varies by step in the method (2) Work is project-based (short-term in nature, with length depending on scope and complexity) and project structured, versus an ongoing process and (3) Results-focused, driven by data, facts, and metrics (Sriram & Revathi, 2016).

This model is relevant to the construction process. First, the construction project is result focused on delivering a final product which could be a residential house, commercial building, road or bridge which are defined by their duration, complexity and scope of the construction project.

Second, a construction project can be defined by different small project activities to achieve the final outcome.

Thirdly, the model is appropriate for ensuring quality in construction projects by combining tools-tasks-deliverables to achieve the final product. The six sigma model has been identified by several researchers (Tchidi et al., 2012; Taner, 2013; Sriram & Revathi, 2016) to have been used in construction projects to deliver projects in time and within the agreed cost.

The proceeding section is an empirical review of literature discussing the independent variables of the study which are contractor relationship, TQM practices in the construction industry and finally the barriers to the implementation of TQM in the construction industry.

2.3 Empirical review

The study intends to look at the extent of TQM implementation in the Kenyan construction industry. TQM has been successful in its implementation in various service and manufacturing industries with little adoption in the construction industry with the exception of Japan who have shown the world that indeed TQM is feasible in the construction industry (Barret, 2000). The reviewed literature looked at contractor relationships from client relations, contractor subcontractor relations and supplier relations. The literature went on further to look at the common TQM practices in the construction industry with a focus on what has been implemented and work in Japan both locally and with their multinational construction companies working abroad. The literature went ahead to also look at the barriers of TQM practices implementation.

2.3.1 Total quality management practices

Several studies have been conducted on TQM and there are several TQM practices that have emerged from these studies.

This section of the study presents the general TQM practices that are found in the literature. The study then goes ahead to present studies that highlight TQM practices that have been adopted in construction studies. Hassan, Mukhtar and Qureshi (2012) conducted a study on impact of TQM practices on Firm's performance of Pakistan's manufacturing organizations and presented a literature review of researchers'

classification of TQM practices adopted in organisations. Saraph et al. (1989) developed and proposed 8 critical TQM practices which include; role of the quality department and employee relations, service and product design, supplier quality management, process management, top management commitment, quality policy and role of divisional top management and quality policy.

Lu and Sohal (1993) study used 9 TQM practices which included benchmarking, statistical and resources control, strategic quality management, training and education, top management commitment, design quality management, information and analysis, process quality management. Flynn et al. (1994) propose 7 quality practices of TQM as product design, customer involvement, workforce management, quality information, top management support, supplier involvement and process management.

Powell (1995) proposed 12 TQM practices and were; closer supplier relationships, zero-defects mentality, benchmarking, measurements and flexible manufacturing, process improvement, training, open organization, committed leadership or executive commitment, measurements and flexible manufacturing, adoption and communication of TQM or adopting the philosophy, employees empowerment, closer customer relationships and process improvement.

Sadikoglu and Olcay (2014) study in Turkey on TQM practices performance and barriers to TQM practice. The study revealed that previous research indicated that overall TQM practices have been positively related to manufacturing and productivity performance, competitive advantage, aggregate firm performance, market share, quality performance, customer satisfaction/results and financial performance.

Kheni and Ackon (2015) conducted a study on the effect of Total Quality Management Practices (TQMPs) on the performance of construction projects in developing countries and found that TQM practices (supplier management, process management, planning, top management leadership and commitment, human resource management, teamwork, information analysis and evaluation, quality culture and customer focus) had a positive impact on the quality performance of construction projects.

The study concluded that TQM practices enhanced the performance of quality in construction projects by reducing rework, delivery time, costs of poor quality, non-conformities, rework, waste and increase the quality of project implementation. This section of the study discusses the TQM practices adopted in construction projects.

2.3.1.1 Customer focus and management

According to Sadikoglu and Olcay (2014), firms that have implemented TQM practices focus on serving their customers. The organisations should first get to know their customers' requirements and expectation and should strive to offer the services and products. In construction, customer focus/management principle consists of achieving the project requirements in regard to the client specification and technical specification. Moreover, it consists of maintaining a close relationship with the customer and to embrace the client focus in the quality management process (Ahire et al., 1996), and developing a strategic alliance with the client (Low & Tan, 2002). The principle of customer focus also consists of the feedback and communication processes on the customers' satisfaction and concerns (Low & Koh, 2010).

2.3.1.2 Knowledge and process management

According to Sadikoglu and Olcay (2014), the knowledge and process management factors ensures that staff have access to reliable, timely, accurate, consistent and necessary information and data needed to do their job efficiently and effectively in the organisation. Low and Koh (2010) agree that the element of information management comes from the principle of management. This is the systematic data collection in every part of the construction improvement, process and problem-solving activities. The information and data collected are adopted to provide a means of learning, guide decisions and keep processes in control. The quality information is provided to staff as feedback on their performance and facilitates learning while maintaining their quality oriented behaviour (Ashford & Cummings, 1983). In regard to the construction industry, the information gathered from each construction project is important for implementing quality management standards in future construction projects.

2.3.1.3 Strategic quality planning

Strategic planning consists of the values, mission and vision of an organisation. These are formed on the basis of introducing a quality concept. An effective strategic quality plan, staff are regarded as an input in developing the mission, vision, objectives and strategies. This often facilitates support and acceptance of strategic quality plan by staff.

Successful strategic quality planning efforts also consider the possibility effects of the plan to the environment before the production and this manifest itself in the improved social responsibility of the organisation (Sadikoglu & Olcay, 2014). According to this principle, it is important for contractors to have a strategic plan for quality management in their organization. This quality strategic management plan can then be used to guide quality management practices in future projects in the firm.

2.3.1.4 People management

The concept of people management revolves around the collaboration between non-managers and managers, and suppliers and customers. This principle is associated with the systems view of firms and is based on advantages that can potentially be derived through partnerships among the parties (Dean & Bowen, 1994). Furthermore, empowerment of staff emphasized whereby staff are motivated to inspect their own work and fix quality problems with the provision of necessary resources and supporting framework. Moreover, effective training improves staff loyalty to the organisation, work performance and motivation (Low & Koh, 2010). Most of the staff in construction projects is often different to every project.

Thus, the challenge in the construction industry is to give TQM training to staff. However, there is need for contractors to train their staff on TQM practices in their duties.

2.3.1.5 Leadership/top management

According to Jaafreh (2013) top leadership commitment is an important aspect in management of quality which leads to increased performance in quality. The top management commitment is a key driver of TQM practice, systems and values and establishing goals to meet and exceed client expectation and needs and enhance performance of the organisation.

The top management role is manifested in the commitment, involvement and leadership in driving TQM implementation thus top management creates firm quality goals and values (Ahire et al., 1996). The contractor should be a champion of TQM practices in the firm so as to influence other employees. Top management support and leadership in TQM implementation in the construction sector identifies the role of the contractor as the leader in TQM implementation.

2.3.1.6 Supplier management

The concept of supplier management emanates from the realisation that organisations rely on each other for resource allocation. The collaboration between suppliers and an organisation thrive on the cooperative interdependence (Anderson et al., 1994). Supply Chain Management (SCM) in TQM imply that streamlining and reducing the supplier base to facilitate manager-supplier relationships (Krause, 1997), developing strategic partnerships with suppliers (Mason, 1996) collaborating with suppliers to ensure that customer expectations are met and involve suppliers early in the product development process to take advantage of their expertise and capabilities (Sadikoglu & Olcay, 2014).

The supplier management is often affected by the “low bidders” strategies which is common practice in construction projects in globally and in Kenya. Haupt and Whiteman (2003) opine that low bidding strategies are the basis for awarding most construction projects more so subcontracting jobs. Deming (1986) recommended that the practice of awarding business on price tag alone should be ended (Yong & Wilkinson, 2001).

A construction project often involves several suppliers and the culture of low bidders is often practiced but is looked down upon for a firm that is trying to achieve quality management.

2.3.1.7 Continual improvement

Continual improvement consists of a commitment to continuously examine the administrative and technical processes for better methods. In improving these processes, a firm can continue to satisfy the customers' expectations (Dean & Bowen, 1994). Continuous improvement involves focusing on processes that can be adjusted to become more efficient. The degree of success is often determined by contrasting the progress against a certain criterion known as "benchmarking". Benchmarking is a scientific and systematic search for best practices that lead to increased performance (Harrington, Voehl & Wiggin, 2012).

The TQM practices discussed in this section of the study are from both construction and non-construction-related studies and have yielded seven possible elements for TQM implementation. In construction industry, these elements were summarized to include customer focus/management, knowledge and process management, strategic quality planning, people management, leadership/top management, supplier management and continual improvement. These TQM practices have been found to contribute to quality management in the construction process which is unique given the different stakeholders in a construction project. These TQM practices are relevant to the client, subcontractors, employees and management of the main contractor.

This review shows that there are predominantly seven (7) of the eight TQM principles which are relevant to the construction industry. The literature reviewed also revealed that these TQM principles have been adopted at different levels in the construction industry. The study limited its investigation of TQM principles to the three which have been shown to be adopted at a higher level among construction companies (Haupt & Whiteman, 2003; Low & Koh, 2010). These three TQM principles are customer focus and management, process management and supplier management.

2.3.2 The influence of contractor-client relationship on TQM practices

The client is either an individual, institution or an organization that needs some work done related to any form of construction infrastructure and is in need of a contractor.

In a TQM setting, the contractor client relationship is encouraged to be long term (Sushil & Kumar, 2013). The contractors that are to be secured should be on a negotiation basis implying that maintaining of relations with established clients should be considered as important as securing new orders from new ones (Barrett, 2000). The relationship of a client and a contractor for the sake of quality should not be dictated by the contract but through social norms. The end product with all its form of quality should be guaranteed to a client. The corporate policies especially those that touch on quality should be adhered to even when it means that money will be lost.

Contraction administration is key in TQM practices in the construction industry. Trust through word of mouth should be followed by written down contracts with the fine print well elaborated so as to ensure interest of both parties are well taken care of. Quality workmanship if not part of the project costing should be agreed upon between the client and the contractor based on the willingness of the client to pay for it (Leonard, 2010). The client is the most important persons in the construction industry whether private and public. Contractors often develop relations with their customers through meeting their facilities and demands constructed (Alotaibi et al., 2013).

In the construction process, the relation between the contractors and customers involves a multilevel complex relationship in which the stakeholders collaborate and simultaneously with stakeholders' networks. Ke et al. (2013) research revealed that the higher quality of relationships at the project implementation process always leads to significantly client satisfaction and good project quality with the construction process. Ashokkumar (2014) affirmed that customers demand improve the quality service, innovations in technology and faster buildings.

The literature review of past studies shows that the contractor-client relationship can affect quality management in construction projects.

The contractor-client relationship can affect the customer focus TQM practice in a construction project. A weak or poor relationship between contractor and client affects the customer focus TQM practice which affects the quality of the construction project due to lack of implementation of client quality concerns.

A strong relationship between the contractor and client has often resulted to improved quality standards in construction projects. The effect of contractor relationships on TQM practices in the construction industry has been conflicting. There are studies that have shown that contractor relationships have a significant influence on TQM practices in the construction industry while other have not found any significant influence of contractor relationships on TQM implementation in construction industry. The study therefore examines whether there is a positive and significant relationship between contractor relationships and TQM practices in the Kenyan construction industry.

2.3.3 The influence of contractor-subcontractor relationship on TQM practices

Subcontractors are an important component of the construction process as they work on approximately 90 % of the total work (Nobbs, 1993). Most of the heavy lifting in the construction industry is done by a group of people with varied skills and infrastructure who are contracted by the main contractor of a project thus the name subcontractors.

It is argued that long term relationships should be formed with subcontractors who provide the main input into the production process (Kuo & Kuo, 2010). This is maintained by the contractor providing continuous work together with fair compensation. The deal striking should be done based on bargaining and not competition (Low & Koh, 2010).

Haupt and Whiteman (2003) study found that lack of interest in TQM among subcontractors was a major hindrance to TQM practice in the construction process. The construction quality process is a key significant to success is the continuous improvement. One of the most significant constraints is better penetration of the process of quality into the work of subcontractors.

The workers and subcontractors are significant to the main contractors' quality activities as they are persons who actually perform the work on-site (Pheng & Ke-Wei, 1996). Othman (2007) study on contractor-subcontractor relationship revealed that interface problems between main contractor and subcontractor may develop due to poorly communicated information which inevitably leads to poor quality product.

Pheng and Ke-Wei (1996) suggested that the role of the major contractor in the construction process is to assist subcontractors to introduce TQM to their staff and show them how to identify and solve problems they may encounter. McIntyre and Kirschenman (2000) study affirmed that contractors that use TQM often report higher client satisfaction, enhanced relationships and improved schedule performance with subcontractors and reduced rework. Hoonakker et al. (2010) findings indicated that contractors know the benefits of quality improvement. Ojo (2015) researched on the effect of contractor-subcontractors relations to the construction duration in Nigeria.

He concluded that strained relations between sub-contractors and contractors often lead to time overruns and affect the performance of construction projects and quality and this can often be avoided by mutual understanding and trust between them.

2.3.4 The influence of contractor-supplier relationship on TQM practices

The quality chain in any construction begins with the supply of products and services (Howarth & Watson, 2012). The supplier is a key determinant of many variables in the construction work such as determining time deliverables and also the quality of the infrastructure. Suppliers have a large and direct impact on the cost, quality, and time aspects of the project (Shinde & Pimplikar, 2015).

Quality management sees the need of quality at each stage in a process relies on the previous stage's quality. TQM lays emphasis on vendors and suppliers of both labor and materials. Deming (1986) emphasized the importance for contractors to build and maintain special collaborations with suppliers by adopting other criteria to award business to suppliers rather than based on price tag alone. Instead, contractors should seek to reduce total costs by operating with a single supplier.

Harrington et al. (2012) recommends that it is important for contractors to have long term relationships with suppliers as it contributes to realizing the best quality and economy.

The reason for supplier involvement in construction projects is for quality improvement and also has been proposed by a number of researchers (Joaquin & Aspinwall, 2010). Arditi and Gunaydin (1997) research confirmed that supplier involvement helps in reducing the divergence in a construction project. Crosby (1989) opined that one of the most significant processes of quality improvement is the relationship between the buyer and supplier.

Majumdar (2016) agrees that collaborative relation with the suppliers/contractors are required for quality management through TQM, which results in a good control over the qualities of the supplies as well as work. There is an agreement among scholars that contractor-supplier relationships can affect TQM implementation in construction projects (Mirawati et al., 2015). Lack of interest in TQM among suppliers has been found to have a significant effect on TQM practice among contractors in the construction process. This suggests that it is important for contractors to engage with suppliers to implement TQM practices.

An organisation that practices TQM focuses in the expectation and needs of the consumers both external and internal. The emphasis is usually on preventing the causes of defects rather than the process of correcting the defects. The TQM organisation fosters a long term association with suppliers which is based on mutual respect and trust (Subramaniam, 2014). Ojo (2015) found that suppliers providing low quality material lead to low quality workmanship in construction projects thus affecting quality management. The significant of supplier participation in construction projects for improvement of quality is evident in a several studies. Arditi and Gunaydin (1997) affirmed that involving the supplier in the quality management process increases alignment to the objectives of the construction projects.

In a construction project, there are several resources that are required and are acquired from a list of different suppliers.

According to TQM experts (Juran and Deming) it is advisable for the contractor to have a small list of suppliers than to have many. It is common practice in the construction industry to select suppliers based on price. However, TQM philosophies recommend that the quality of the supplier should be the criteria by which contractors can select their suppliers. The contractor-supplier relationship affects TQM practices of supplier management and the continual improvement processes.

2.3.5 Barriers to the implementation of TQM practices in the construction industry

Several studies have highlighted the barriers to TQM implementation in organizations. Some of these studies are highlighted in this section. Seng and Ooi (2013) conducted a study on barriers to TQM implementation in Malaysia. The study found that most organisations are suffering from lack of skilled staff in the process of TQM implementation (Hoonakker et al., 2010). Unskilled staff is a significant barrier in the implementation process. In order for an organisation to produce high quality products, staff needs to know how to perform their work. Staff needs to have the requisite knowledge on how to perform their job efficiently and effectively (Seng & Ooi, 2013).

The low bid culture and mindset in traditional bidding process in the construction industry is a barrier to TQM practice in the sector (Harrington et al., 2012). Since construction organizations' projects are acquired based on competing bids, clients have always paid more attention to the price rather than the value. The clients are often looking for the contractors with the lowest or cheapest cost. This has resulted to preference for low pricing over other criteria which include experience and reputation in the construction industry. In order to gain the project, construction organisations have to reduce the cost to compete with rivals (Seng & Ooi, 2013).

According to Harrington et al. (2012) communication plays a significant role in TQM implementation. Organisations rely on the internal knowledge and information which is not often sufficient to improve product quality which needs both external and internal communication.

Studies have however shown that organisation lack the effective communication among external and internal team players which in the end become a barrier to TQM implementation (Low & Teo, 2004; Shibani et al., 2012). Al-Sabek (2015) conducted a study on critical factors affecting the implementation of total quality management in the construction industry in United Arab Emirates. The research showed that some of the significant constraints in TQM implementation were observed and ranked in their order of significance; lack of education, nature of construction, too much paper work, lack of interest within suppliers and subcontractors and tight scheduling.

In their study on TQM implementation in Ghana's construction industry, Kheni and Ackon (2015), identified several TQM barriers which included; lack of expertise (skilled workers), lack of effective communication, lack of top management understanding and commitment, resistance to change by project stakeholders, organization's emphasis on short term objectives, low bid mindset, too much documentation requirement and lack of training and education to drive the improvement process. Hoonakker et al. (2010) study on TQM barriers and benefits in the construction industry found that lack of supervision, unrealistic deadlines, lack of skilled workers, lack of proper equipment, product problems, working with new people, turnover in company and staff attitude or 'bad seed' effect.

In Iraq, Hadi and Adavi (2016) conducted a study on the barriers in implementing TQM on construction projects. The research revealed that most organisations experiencing a lack of skillful workers in the process of TQM implementation. A critical barrier to TQM practice was found to be unskillful workers and organisations to be able to produce higher quality services and products need employees whom possess requisite knowledge to perform their jobs efficiently and effectively.

Ahmed (2010) found that the barriers to TQM implementation were lack of employee understanding/understanding, emphasis on short-term objectives, lack of resources/expertise in TQM, lack of training and education to drive the improvement process, changing attitude and behaviour, cost and schedule taken as major priorities and

too many documents are required (lack of documentation ability). In a research on QM of large-scale projects in Hong Kong, Au and Yu (1999) established that TQM practices barriers in process procedures, documentation and control of quality inspection.

Lai, Weerakoon and Cheng (2002) study found that there are challenges in implementing quality management in Hong Kong's construction sector in terms of the communication of teamwork structures for quality improvement and improvement information. In his study, Kubal (1996) confirmed that the construction sector lacks in mutual support and open communications that derive from trust-based relations among project stakeholders to make changes to quality improvement (Chin-Keng & Hamzah, 2011).

Arditi and Gunaydin (1997) argued the transient nature of staff in the construction projects make it hard for crafting labour, training workers for TQM in the construction industry. Hoonakker et al. (2010) stated that one of the reasons is the transient nature of construction and building, many stakeholders and lack of standardization (organisations, professions and occupations). Kazemi (2016) affirmed that the most significant militating factors in TQM implementation in construction firms are seen as lack of client focus, lack of proper training for workers at all levels, insufficient commitment by top leadership, lack of well-developed strategy/plan, transient nature of staff, project staff regard TQM as irrelevant, low bid subcontracting culture and lack of efficient operational approach.

The barriers facing TQM implementation in the construction industry have been distinguished into three categories. Serpell (1999) observed employee, cultural, procedural barriers in quality system implementation. Employee barriers have to do with the challenges of TQM implementation due to employee factors. The cultural barriers are those that are pertinent in an industry while procedural barriers to quality management are those that are occur within the processes and procedures of an industry. In this case a construction project. The study adopted this categorization for the various barriers identified from the literature review.

2.4 Summary of literature

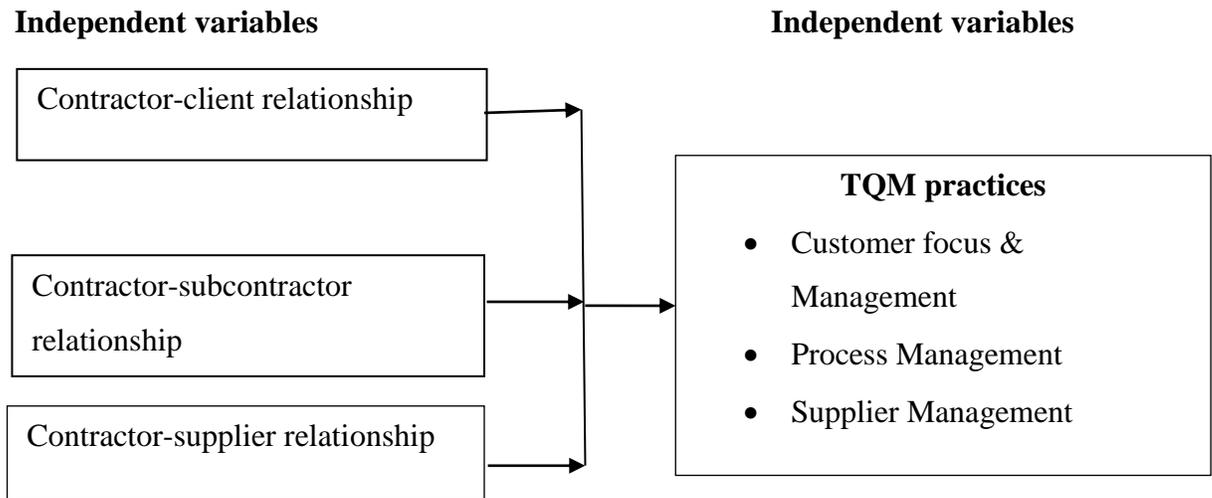
The review revealed that TQM was highly practiced at three levels, these are: customer focus and management, process management and supplier management. The client-contractor relationship was shown an important component of a construction project. This means that the customer expectation of a project should be a critical success factor for a contractor to deliver a construction project. The review further revealed that contractors often use subcontractors to perform work on construction projects and quality management practices are transferred to subcontractors.

This review revealed that construction projects require several materials and this involves several suppliers and the contractor is required to manage these relationships to ensure quality and cost-friendly materials for a construction project. However, the studies reviewed did not show the relevance of these relationships with regard to TQM practice. Moreover, there is less evidence in the literature review on the influence of the contractor relationships on TQM practices in the Kenyan context a research gap that this study intends to fill.

2.5 Conceptual framework

The conceptual framework (Figure 2.1) shows the relationship between contractor relationships and TQM practices. The independent variable is contractor relationships and is indicated by contractor-client relationship, contractor-subcontractor relationship and contractor-supplier relationship. The dependent variable for the study is TQM practices in the construction industry. The literature reviews revealed that customer focus and Management, Process Management and Supplier Management are the TQM practices that are adopted in the global construction industry and were used to measure TQM practices among contractors in the construction industry in Nairobi County.

Figure 2.1: Conceptual framework



Source: Author (2017)

Table 2.2: Operationalization of variables

	Variables	Indicators	Rating measurement	Tools of Analysis	Sources
TQM practices	Customer Focus and Management	Offering differentiated service; maintaining close contact with clients; provision of indirect services	Five point scale 1. Very lowly practiced 2. Lowly practiced 3. Moderately practiced 4. Highly practiced 5. Very highly practiced	Mean and standard deviation Correlation and regression	Low and Koh (2010); Haupt and Whiteman (2003)
	Process Management	Practicing continuous quality control; providing clear process instructions; conducting final inspection			
	Supplier Management	Fostering close and long-term relationship; reliance on few suppliers; fostering long-term relationship with suppliers			
Contractor relationships	Contractor-client relationship	Organization focuses on customer requirements; effective communication between clients and contractor; there is team work philosophy	Five point scale 1. To a very small extent 2. To a small extent 3. To a moderate extent 4. To a large extent 5. To a very large extent	Mean and standard deviation Correlation and regression	Kuo and Kuo, (2010); Alhasanat and Altayeb (2014); Harrington, Voehl and Wiggin (2012); Howarth and Watson (2012)
	Contractor-subcontractor relationship	Subcontractors follow contractor guide; subcontractor interested in implementing TQM; subcontractors are selected on quality of work			
	Contractor-supplier relationship	Collaborative relationship with suppliers/contractor; less reliance on competitive tendering; organization focuses on supply chain system			
Barriers to TQM implementation	Employee barriers	Lack of proper training; transient nature of workforce; employee interest in implementation of TQM	Five point scale 1. To a very small extent 2. To a small extent 3. To a moderate extent 4. To a large extent 5. To a very large extent	Mean and standard deviation Correlation and regression	Kheni and Ackon (2015); Chin-Keng and Hamzah (2011); Arditi and Gunaydin (1997); Kazemi (2016)
	Cultural barriers	Multiple stakeholders with conflicting interest; subcontractor and supplier interest; creating and maintaining team spirit			
	Procedural barriers	Too much documentation; difficulty in measuring results; low bid subcontracting			

Source: Author (2017)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was used in the study. These are the tools and techniques that make research work possible. This section encompassed the research design, sampling and population, data collection procedures, reliability and validity, data analysis and finally ethical consideration.

3.2 Research design

The choice of a research design has been noted by Kumar (2010) to be dependent upon the nature of the problem that is posed by the research aim. The research design has been argued to be essential since it facilitates the smooth sailing of the various research operations thus yielding maximum information (Gupta, 2002). The reliability of the research findings is also pegged on the appropriateness of the method that is used. This study applied the use of cross-sectional research design since the study was aimed at an investigation of the extent of TQM implementation in the Kenyan construction industry.

3.3 Population and sampling

A population consists of all the items in a field of enquiry (Kazdin, 2003). The target population for the study was 5,777 contractors as registered by the National Construction Association (NCA) in Nairobi County (NCA, 2016). The key drivers for the selection of a sample was mostly time and the costs involved in carrying out a research (Kothari, 2004). Additionally, the sample should be a representative view of the whole population as close as possible so that to produce a miniature cross-section. To identify the sample size for the study, the study adopted the Yamane (1967) sampling formula, Where; N = study population, e = tolerance at the preferred level of confidence, n = sample size, take $\alpha = 0.05$ at 95 % confidence level. According to Yamane (1976) the formula can determine the sample size:

$$n = \frac{N}{1 + N(e^2)}$$

Thus, the sample of contractors in Nairobi County was;

$$\begin{aligned}n &= 5,777 / 1 + 5,777 (0.07)^2 \\ &= 5,777 / 29.3073 \\ &= 197\end{aligned}$$

The Probability Proportion Sampling (PPS) procedure was used to be able to select a proportionate sample size for each of the categories of the population identified in the strata sampling procedure. This sampling formula was adopted in order to give larger strata a chance to have a larger probability of selection as compared to smaller strata. The sample size for each category is calculated as the population of individual category of staff divided by the total population of all categories (target population) multiplied by the sample size of 197 thus;

$$\frac{\text{Population of the Independent NCA Level}}{\text{Total Target Population}} \times 197$$

The study adopted stratified random sampling procedure. The stratified sampling procedure allows the study to divide the population into mutually exclusive categories. These categories are based on class of construction works to be undertaken which is determined by the value of the contract. In this study, the population was stratified according to the categorization of contractors by the NCA from level one to eight (Appendix 3).

Simple random sampling was used to select construction companies in each of the eight NCA levels. Simple random sampling technique allows for all the members of the sample an equal chance of selection in the final sample size (Frerichs, 2008). Using a list of all the contractors in an NCA level, the study randomly selected the required number of respondents in each level.

Table 3.1 shows the sample size distribution in categories based on the capacity of different contractors to handle infrastructural development projects.

Table 3.1: Sample size distribution table

Contractor categories	Population	Sample
NCA 1	213	7
NCA 2	166	6
NCA 3	266	9
NCA 4	443	15
NCA 5	732	25
NCA 6	1370	47
NCA 7	1714	58
NCA 8	873	30
Total	5,777	197

Source: Author (2017)

3.4 Data collection

As a method of collecting data for this enquiry, the study applied the use of a structured questionnaire. The structured questionnaire techniques is deemed appropriate for this study because the study objectives are definite and concrete while at the same time, the technique allowed for the predetermination of questions (Sekaran, 2005). All the questions have the same wording and were presented to the respondents in the same manner using a 5 point Likert scale. The questionnaire comprised of 5 sections, these included the firm profile, level of TQM implementation among contractors, influence of contractor relationships on TQM implementation, barriers to TQM implementation and TQM adoption factors.

There are two studies (Alotaibi et al., 2013; Low & Koh, 2010) that have measured the extent to which TQM implementation have been implemented in construction companies and these were used to measure TQM implementation in this study. The TQM practice section in the questionnaire asked respondents to indicate the extent to which TQM principles were practiced (Claver et al., 2002; Kululanga et al., 2002).

The researcher extracted 3 TQM principles that were extracted from the literature review to indicate those TQM principles that are more practiced among construction sector. In each of the items, there were three statements that the researcher asked the respondents to indicate the ranking of TQM implementation in the sector by what extent it was practiced from a 1 to 5 Likert-like scale; “1” being “very lowly practiced” to “5” being “very highly practiced”. Standard deviation and mean were used to measure the level of TQM implementation. In general, the higher the mean value, the higher level of agreement with the statements and the smaller the standard deviation the more concentrated the data around the mean (Jennings & Loan, 2001).

The structured questionnaires are simple to administer to a large population and also allow for easy quantitative and relationship analysis. The questionnaires were dropped at construction firm offices premises and later picked from them. The respondents constituted those in the management of the organizations, more specifically the project managers. The study obtained the list of registered contractors in Nairobi County and visited their offices to drop the questionnaire. The study made phone calls and send emails to firms to confirm their participation before administering questionnaires.

3.5 Reliability and validity

Reliability refers to the degree of consistency and stability in an instrument (Kumar, 2010). To establish the reliability of the instrument, the study used Cronbach Alpha where a pilot test of 5 questionnaires was randomly administered to 5 contractors and the Cronbach Alpha was calculated. This method has been widely used to assess internal consistency reliability five point likert scale (Cohen, & Morrison, 2008). The instrument reliability was established at 0.72 which is accepted as a good measure of reliability (Tavakol & Dennick, 2011). Validity is the extent to which a survey instrument actually measures what it expects to measure (Kimberlin & Winterstein, 2008). To establish the validity of the instrument, the study used constructs that have been used by past studies and from the literature review. The study guaranteed confidentiality and anonymity of the information given by respondents further ensured the validity of the instrument.

3.6 Data Analysis

The data analysis for this study was analysed through quantitative approaches. The questionnaire used for the study comprised of nominal, ordinal and interval scales which could be analysed quantitatively. There are two forms of statistical analysis, there are descriptive and inferential statistics. The study used the mean, standard deviation, frequencies and percentages were the descriptive analysis used. Correlation and regression analysis was used to measure the strength of relationship and direction of the relationship between the independent and dependent variables. The Statistical Package for Social Sciences (SPSS) Version 22 to analyse the data. The study adopted a regression model so as to test the relationship between the dependent and independent variables as depicted below. The study used the following regression model;

$$Y_1 = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y = TQM practices

B₀ = Constant term;

β₁, β₂ and β₃ = Beta coefficients

X₁ = Contractor-client relationship

X₂ = Contractor-subcontractor relationship

X₃ = Contractor-supplier relationship

3.7 Ethical consideration

Ethical issues in research most of the time arise from the manner in which the respondents are treated. The study ensured that the respondents were treated with utmost respect before, after and during the research. All the ethical guidelines if any, among the respondents were strictly adhered to at all times. Informed consent was gotten from all the respondents who agreed to be part of the study with an adherence of high levels of confidentiality, anonymity and courtesy.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents the research findings on the influence of contractor relationships on TQM implementation in the Kenyan construction industry presented in charts and tables and the researchers' interpretation.

4.2 Response rate

The response rate is defined as the ratio of surveys returned from those administered in the field. The study was able to get 143 filled questionnaires from the 197 administered questionnaires which present a response rate of 72.6 %. Mugenda and Mugenda (2008) opine that a response rate of 70 % and above is very good.

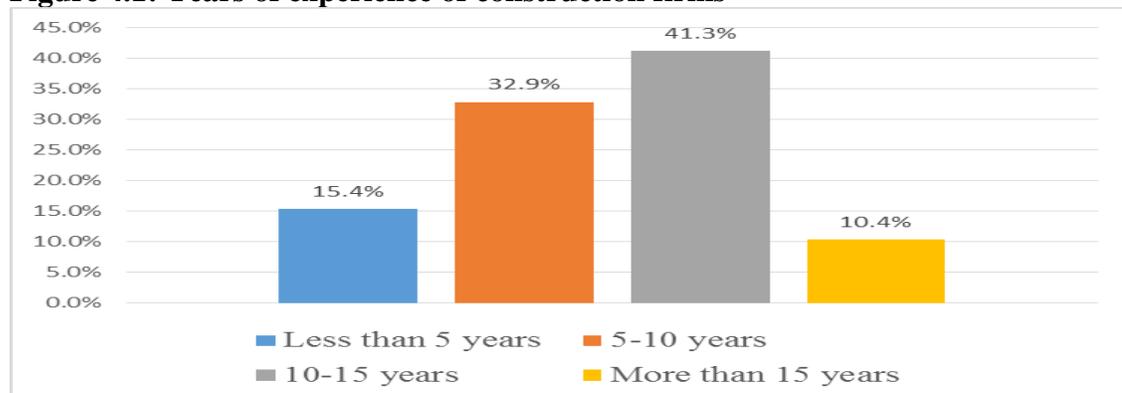
4.3 Firm characteristics

The study was interested in experience of firm, firm size, and ownership structure and number of sub-contractors.

4.3.1 Experience of firm

The findings show that 41.3 % of firms had 10-15 years' experience in the construction industry, 32.9 % had 5-10 years' experience, 15.4 % had less than 5 years' experience and 10.4 % had more than 15 years' experience as depicted in Figure 4.1

Figure 4.1: Years of experience of construction firms

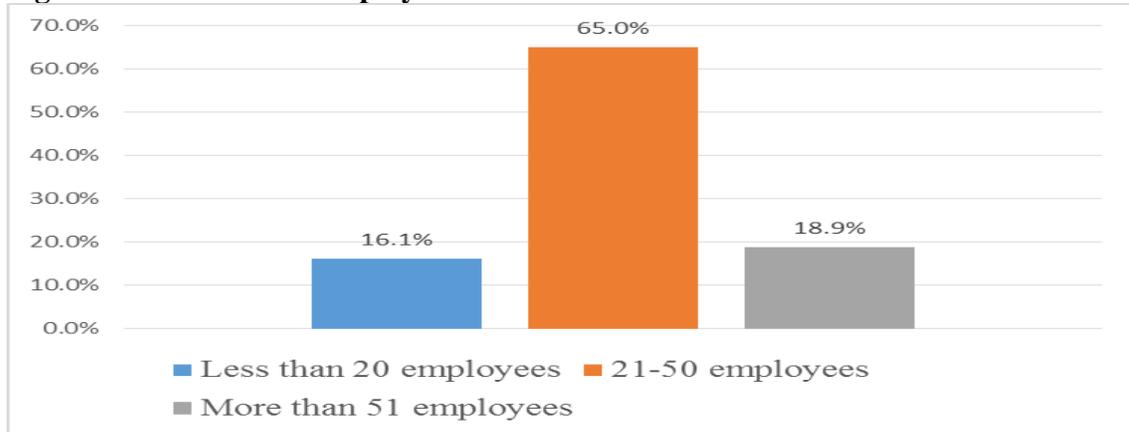


Source: Author (2017)

4.3.2 Firm size

Figure 4.2 shows that majority of the construction firms sampled in the study had 21-50 employees, 18.9 % had more than 51 employees and 16.1 % had less than 20 employees. This finding indicates that majority of constructions firms were Small and Medium Enterprises (SMEs) which are defined as companies that had up to 50 members of staff.

Figure 4.2: Number of employees in construction firms

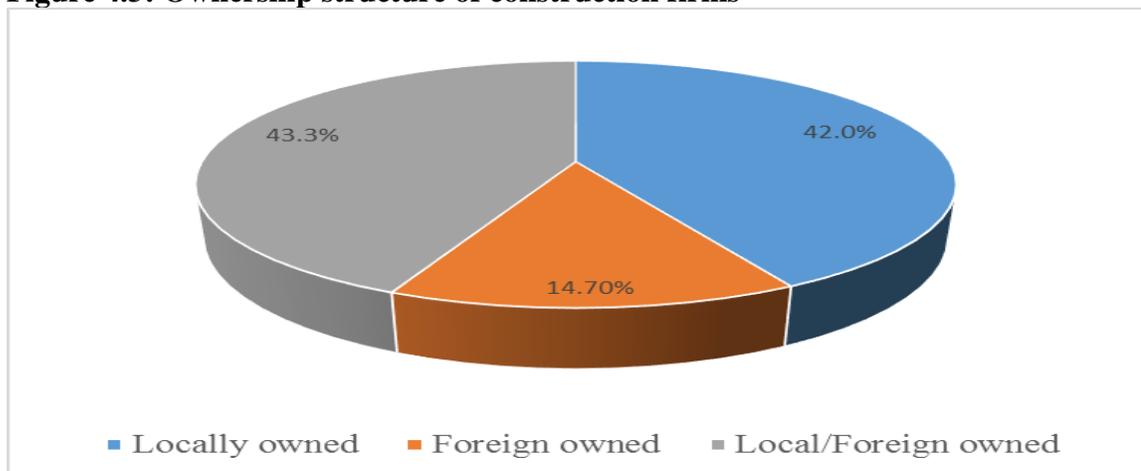


Source: Author (2017)

4.3.3 Ownership structure

In terms of their ownership structure, the study results in Figure 4.3 show that 43.3 % were local and foreign owned construction firms, 42.0% were locally owned construction firms and 14.7 % were foreign owned construction firms.

Figure 4.3: Ownership structure of construction firms

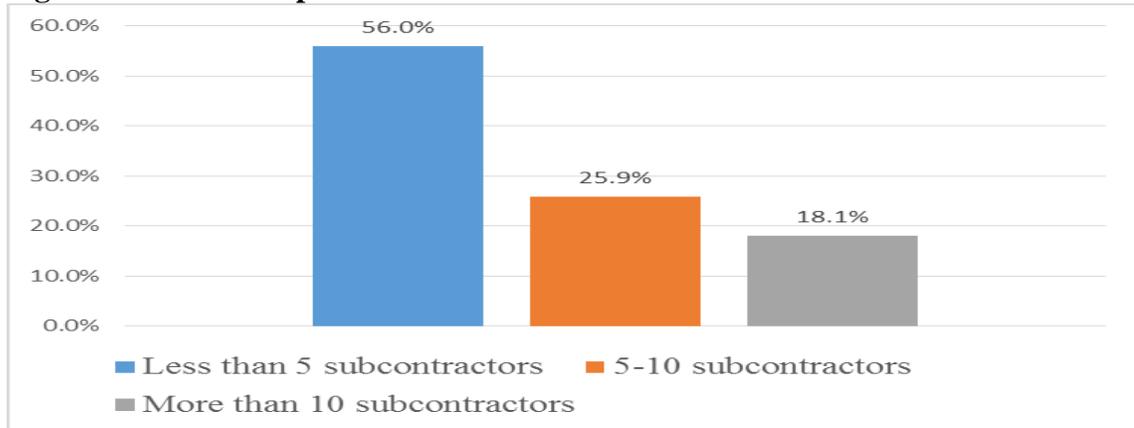


Source: Author (2017)

4.3.4 Number of sub-contractors

The study found that 56.0 % of construction firms had less than 5 subcontractors, 25.9 % had 5-10 subcontractors and 18.1 % had more than 10 subcontractors as indicated in Figure 4.4.

Figure 4.4: Ownership structure of construction firms



Source: Author (2017)

4.4 TQM practices in the construction industry

The study sought to identify the TQM principles implemented by contractors. The literature review indicated that there were three TQM practices that were implemented at a higher level in the construction sector. These are customer focus and management, process management and supplier management.

Table 4.1: TQM practices among construction Firms

TQM practices		Mean	Standard Deviation
Customer Focus and Management	The organization provides indirect services to customers construction projects	4.21	1.11
	The organization provides differentiated services to clients in their construction projects	4.20	1.13
	The organization maintains close contact with client during delivery of construction projects.	3.80	1.40
	Overall mean score	4.07	1.21
Process Management	The organization provides clear process instructions in ongoing construction projects	4.08	1.20
	The organization practices continuous quality control on construction processes	3.70	1.25
	The organization conducts final inspection, review, and checking in construction projects.	3.13	1.23
	Overall mean score	3.64	1.22
Supplier management	The organization offers long term relationship with suppliers/subcontractors in construction projects	3.53	1.14
	The organization relies on relatively few suppliers/subcontractors in a construction project	3.52	1.19
	The organization fosters close and long-term suppliers/subcontractors relationship.	3.28	1.15
	Overall mean score	3.44	1.16

Source: Author (2017)

In regard to the TQM principle of customer focus management, the findings show that a contractor providing indirect services to customers' construction projects was very highly practiced with a mean of 4.21 and a standard deviation of 1.11 as shown in Table 4.1. Moreover, the results show that contractors practiced providing clear process instructions in ongoing construction projects with a mean score of 4.08 and a standard deviation of 1.20.

In terms of the supplier management implementation among contractors, the results revealed that offering long term relationship with suppliers/subcontractors in construction projects was moderately practiced with a mean of 3.53 and standard deviation of 1.14.

4.5 Contractor-client relationships in the construction industry

The study sought to determine the contractor-client relationship influence TQM practice among contractors. The findings show that team work had a moderate extent on TQM practice with a mean of 3.61 and standard deviation of 1.42 as shown in Table 4.3. This finding suggests that the most important dimension of the contractor –client relationship is teamwork during the construction process which is indicated by cooperation and collaboration between the client and the contractor.

Table 4.2: Contractor-client relationship

Contractor-client relationship		Mean	Standard deviation
a	There is a 'teamwork' philosophy in controlling ongoing construction projects	3.61	1.42
B	The organization focuses on customer requirements in undertaking construction projects	3.36	1.43
c	There is effective communication between client and contractor in construction projects.	3.29	1.40
Overall mean score		3.42	1.42

Source: Author (2017)

4.6 Contractor-subcontractor relationship in the construction industry

The fourth objective of the study was to determine the influence of contractor-subcontractor relationship on TQM practice among contractors. In regard to contractor-subcontractor relationship, the findings indicated that sub-contractors followed contractors guide to quality in construction projects to a very large extent with a mean of 3.76 and a standard deviation of 1.22 as presented in Table 4.4.

Table 4.3: Contractor-subcontractor relationship

Contractor-subcontractor relationship		Mean	Standard deviation
a	Subcontractors follow contractors guide to quality of the construction project	3.76	1.22
b	Subcontractors are selected based on quality of work in past construction projects	2.94	1.36
c	Subcontractors are interested in implementation of TQM in ongoing construction projects.	2.34	1.47
Overall mean score		3.01	1.35

Source: Author (2017)

4.7 Contractor-supplier relationship in the construction industry

The study's fifth objective was to establish the effect of contractor-supplier relationship on TQM practice among contractors. The results further showed that there was a collaborative relation with the suppliers and contractors to a moderate extent with a mean of 3.27 and a standard deviation of 1.40 as shown in Table 4.5.

Table 4.4: Contractor-supplier relationship

Contractor-supplier relationship		Mean	Standard deviation
a	Collaborative relation with the suppliers/contractors	3.27	1.40
b	The organization focuses on 'supply chain' system of Construction	3.11	1.37
c	There is less reliance on competitive tendering and formal construction projects.	3.00	1.43
Overall mean score		3.13	1.40

Source: Author (2017)

4.8 Barriers to TQM practices among construction firms

The study sought to identify the barriers facing TQM implementation among contractors. The respondents were asked to indicate to what extent these barriers militated TQM implementation among construction firms.

Table 4.5: Barriers to TQM Practices among construction firms

Barriers to TQM Practices		Mean	Standard deviation
Employee barriers	There is a lack of proper training and continuous skills for TQM implementation in construction	3.18	1.19
	The transient nature of workforce in construction companies hinders TQM implementation in construction	2.91	1.13
	Employee interest in implementation of TQM practices affects implementation of TQM principles.	2.63	1.30
	Overall mean score	2.91	1.20
Cultural barriers	Creating and maintaining team spirit for TQM implementation is a challenge in the construction sites	3.34	1.34
	Sub-contractors and Suppliers interest in TQM implementation affects TQM successful implementation in construction sites	2.69	1.17
	Multiple stakeholders with conflicting interests in construction are a barrier to TQM implementation.	2.55	1.25
	Overall mean score	2.86	1.25
Procedural barriers	Low bid subcontracting is a constraint to successful TQM practice in construction sites	3.40	1.33
	Problems in results measurement on construction sites is a hindrance to TQM practice	2.88	1.12
	Too much documentation in implementation of TQM principles inhibits successful TQM implementation in construction sites.	2.43	1.28
	Overall mean score	2.90	1.24

Source: Author (2017)

The findings show that sub-contractors and suppliers interest in TQM had the most effect on TQM implementation in construction followed by employee interest in TQM and low bid contracting. Table 4.2 show that lack of proper training and continuous skills for TQM implementation in construction projects was a barrier to TQM implementation to a moderate extent with a mean score of 3.18 and standard deviation of 1.20.

In terms of the cultural barriers, the findings revealed that creating and maintaining team spirit for TQM implementation is a challenge in construction sites moderately affected TQM implementation with a mean score of 3.34 and a mean score of 1.34.

Moreover, the findings indicated that low bid subcontracting to a moderate extent was a barrier to TQM implementation with a mean score of 3.40 and a standard deviation of 1.33.

4.9 Correlation results

Table 4.6 shows the correlation results between contractor client relationship, contractor subcontractor relationship and contractor supplier relationship on TQM implementation on the construction industry.

The findings show that there was a positive and significant relationship between Contractor client Relationship ($r = 0.298$; $p = 0.000$) and contractor subcontractor relationship ($r = 0.0199$; $p = 0.017$) with TQM implementation.

The results however found that there was a negative but not statistically significant relationship between contractor supplier relationship and TQM implementation in the construction industry ($r = -0.019$, $p = 0.825$). This finding suggests that contractor client relationships were the most important determinants in TQM practice in construction projects in Nairobi County. Contractor-subcontractor relationships were the second most significant to influence TQM practice in construction projects. The finding implies that contractor-supplier relationship influence on TQM practice was is not a significant determinant. The findings also show that there was a positive relationship between TQM practices and TQM implementation ($r = 0.029$, $p = 0.727$) but this was not significant.

Table 4.6: Correlation Analysis

Variables	Contractor Client Relationship	Contractor Subcontractor Relationship	Contractor Supplier Relationship	TQM practices
Contractor Client Relationship	1			
Contractor Subcontractor Relationship	.316(**)	1		
	.000			
Contractor Supplier Relationship	-.040	.154	1	
	.633	.066		
TQM Implementation	.298(**)	.199(*)	-.019	1

Source: Author (2017)

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

4.10 Regression results

The aim of regression analysis is to determine the direction of the relationship between the dependent and independent variables. The study conducted a multiple regression analysis between the independent and dependent variables of the research.

4.11 Model summary

The model summary output in regression analysis gives information on the regression line ability to explain the variation in the response variable. Table 4.7 shows a model summary of the regression analysis shows that contractor relationships explain 10.2 % of variation in TQM practice in the construction industry.

Table 4.7: Model summary

Model	R	R square	Adjusted R square	Std. Error of the estimate
1	.319(a)	.102	.082	6.66381

Source: Author (2017)

a Predictors: (Constant), Contractor supplier relationship, Contractor client relationship Contractor subcontractor relationship

4.12 ANOVA

Table 4.8 shows the ANOVA results of the regression analysis which shows that the F statistic was 5.245 and the significance level is 0.002 which is less than 0.05 which implies that the study model is statistically significant in explaining the influence of contractor relationship on TQM practice in the construction industry in Nairobi County.

Table 4.8: ANOVA ^(b)

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	698.757	3	232.919	5.245	.002(a)
	Residual	6172.487	139	44.406		
	Total	6871.245	142			

Source: Author (2017)

a Predictors: (Constant), Contractor supplier relationship, Contractor client relationship, Contractor subcontractor relationship

b Dependent Variable: TQM practice

4.13 Regression coefficients

The regression coefficients indicate the unit change of the independent variables on the dependent variable. Table 4.9 presented the regression coefficients of contractor-client relationship, contractor-subcontractor relationship and contractor-supplier relationship on TQM practice among contractors in Nairobi County. The proposed regression model for the study therefore becomes:

$$Y = 25.391 + 0.525X_1 + 0.357X_2 + -0.060X_3$$

Table 4.9: coefficients ^(a)

Variables	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	25.391	2.857		8.887	.000
Contractor client relationship	.525	.173	.258	3.037	.003
Contractor subcontractor relationship	.357	.253	.122	1.412	.160
Contractor supplier relationship	-.060	.182	-.027	-.330	.742

Source: Author (2017)

The results indicated that a unit increase in contractor client relationship leads to a 0.525 unit increase in TQM practice and is statistically significant ($p = 0.003$). A unit increase in contractor subcontractor relationship influenced a 0.357 unit increase in TQM practice and this is not statistically significant ($p = 0.160$). The study however found that contractor-supplier relationship had an inverse effect on TQM practice and this was insignificant ($p = 0.742$).

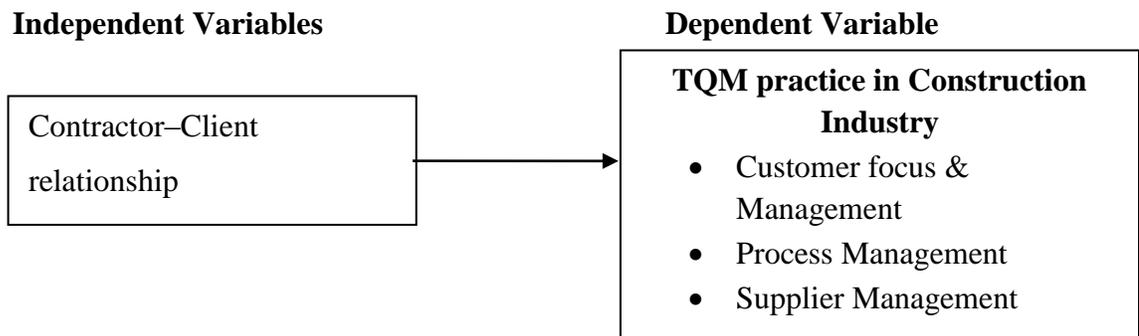
4.14 Summary of the Regression Results

The regression analysis gives three tables of results, the model summary, ANOVA results and the coefficient results. The model summary showed that the study model, that is, the contractor-client relationship, contractor-subcontractor relationship and the contractor-supplier relationship explained 10.2 % of the change in TQM practices in the construction industry. This means that there is need for further studies to identify the 89.8 % factors that influence TQM practice in the construction industry. The ANOVA table shows the significance of the model in predicting change in the dependent variable. The ANOVA summary showed that the independent variables were significant ($p < 0.05$) in explaining change in TQM practice in the construction industry. The coefficient results indicated that contractor-client relationship (has the most effect on TQM practice in the construction industry in Nairobi County).

4.15 Conceptual framework revisited

The initial conceptual indicated that contractor-client, contractor-subcontractor and contractor-supplier relationship had an effect on TQM practice in construction industry. However, the study findings revealed that contractor-client relationship had a positive and significant effect on TQM practice. The revisited conceptual framework thus becomes:

Figure 4.5 Conceptual framework revisited



CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter of the study presents a discussion of the study findings which is presented in subsections of the study objectives. The chapter also presents the conclusions, recommendations for policy and practice and areas for further research.

5.2 Discussion of findings

This section presents a discussion of the study findings. The section is presented in subsections of the five specific objectives of the study.

5.2.1 TQM practices in the Construction Industry

The study sought to establish TQM practices among contractors in the construction industry. The study measured the implementation of customer focus and management, process management and supplier management. The study results showed that in regard to customer focus and management contractors provided indirect services to customers' construction projects. This finding corroborates Chiles and Choi (2000) argument that customer focus and management is the main principle of TQM.

In regard to process management, the findings showed that contractors practiced providing clear process instructions in ongoing construction projects. According to Low and Low (2010) the clear instruction in constructions are characterized in the form of a clear method statement and well-structured, inspection-and-test plans and work flow of the construction project. The study findings revealed that long-term relationship with suppliers/subcontractors in construction projects was the most implemented supplier management principle.

This finding supports past studies that have shown the importance of contractors using the same suppliers over a long time improves the quality and costs of services and goods for construction and enhances TQM implementation in construction projects.

According to Mirawati et al. (2015) the benefit for saving costs is with subcontractors' emphasis on the significance of supplier management.

The three most practiced TQM principles adopted in the global construction industry were measured. These were Customer Focus and Management, process and supplier management. The descriptive analysis showed that customer focus was the most practiced TQM principle. The study therefore concludes that customer focus and management is highly practiced TQM principle among contractors in Nairobi County.

5.2.2 The influence of contractor-client relationship on TQM practices

The descriptive statistics showed that among the statements indicative of contractor-client relationship was implementing a teamwork philosophy in controlling ongoing projects signifying the importance of collaboration and cooperation between the contractor and the client. The correlation results indicated that there was positive and significant relationships between contractor-client relationship ($r = 0.298$; $p = 0.000$) and TQM practice. The regression analysis showed that there was a positive and significant influence of contractor-client relationships ($\beta = 0.525$; $p = 0.003$) on TQM practice in the construction industry in Nairobi County.

This finding is supports past scholars who proved that TQM has been effectively used by contractors and clients in the construction sector and this often begin with customer commitment. Barber, Graves, Hall, Sheath and Tomkins (2000) concluded that the service quality that the customers receive by adopting TQM is the customers' involvement and contact with the services' supplier. Sebastian (2011) argued that TQM is dependent on the organisations and the stakeholders to adopt a long-term strategy of collaboration and this makes the customer satisfaction is key. This finding support the definition of quality, performances, complying with clients demands in appearance, meeting clients' expectations and reliability of the project with a given cost range (Jha & Iyer, 2006). The study therefore concludes that customer focus and management is highly practiced TQM principle among contractors in Nairobi County.

The third objective of the study was to determine the effect of contractor-client relationship on TQM practices. The findings show that teamwork was an important dimension of contractor-client relationship. Inferential statistics further proved that contractor-client relationship has a positive and significant effect on TQM practices. The study therefore concludes that contractor-client relationship has the largest effect on TQM implementation in construction industry of Nairobi County.

5.2.3 The influence of contractor-subcontractor relationship on TQM practices

With regard to the contractor-subcontractor relationship, the descriptive results showed that subcontractors follow contractors guide to quality of the construction project to a moderate extent. The correlation results indicated that there was a positive and significant relationship between contractor-subcontractor relationship ($r = 0.199$; $p = 0.017$) and a positive and significant influence of contractor-subcontractor on TQM implementation in construction industry. The regression analysis indicated that an increase in contractor-subcontractor relationship led to a 0.357 increase in TQM practice among contractors and this was insignificant.

This finding goes against past studies that have found a positive and significant influence of contractor-supplier on TQM implementation. Mirawati et al. (2015) reported that there was consensus among researchers that contractor-supplier relationships directly affect TQM practices in construction projects. Haupt and Whitman (2003) alluded that lack of interest in TQM among suppliers has been found to have a significant effect on TQM practices among contractors in the construction process. Harrington et al. (2012) propose that TQM being regarded was an internal process by the organisation and thus does not include suppliers in the processes and this creates a problem in TQM implementation.

This finding corroborates earlier findings of Haupt and Whiteman (2003) which revealed that lack of interest in TQM among subcontractors were a major hindrance to TQM practice in the construction process. An earlier study of Pheng and Ke-Wei (1996) suggested that main contractors should in most times assist the contractors to introduce TQM to their staff and how to identify issues and how to solve them.

The study therefore concludes that contractor-subcontractor relationship has no significant effect on TQM practice.

5.2.4 The influence of contractor-supplier relationship on TQM practices

The study found that respondents moderately ranked collaborative relation with the suppliers/contractors as an important construct for the contractor – supplier relationship. The correlation results revealed that there was a negative and non-significant relationship between contractor – supplier relationship ($r = -0.019$; $p = 0.825$) and TQM implementation in the construction industry. The regression analysis also showed that contractor-supplier relationship had a negative influence and non-significant effect on TQM implementation on construction industry.

These findings contradict previous studies that have found an effect of contractor-supplier relationship on TQM practices in the construction industry. Ojo (2015) found that suppliers providing low quality material lead to low quality workmanship in construction projects thus affecting quality management. The significance of supplier participation in construction projects for improvement of quality is evident in several studies. Arditi and Gunaydin (1997) affirmed that involving the supplier in the quality management process increases alignment to the objectives of the construction projects.

The study therefore concludes that contractor-supplier relationship has no effect on TQM practice in the construction industry in Nairobi County.

The fifth objective of the study was to examine the effect of contractor-supplier relationship on TQM practice in the construction industry in Nairobi County. The descriptive findings revealed that collaborative relation with the suppliers-contractors contributed to TQM practice. The inferential statistics revealed an inverse and insignificant effect of contractor-supplier relationship on TQM practice. The study therefore concludes that contractor-supplier relationship has no effect on TQM practice in the construction industry in Nairobi County.

5.2.5 Barriers to TQM practices among contractors

The TQM barriers extracted from the literature review that were analyzed in the study were employee related barriers, cultural barriers and procedural barriers. In regard to the employee barriers, contractors identified lack of proper training and continuous skills as a barrier to TQM implementation in construction industry. This finding corroborates Haupt and Whiteman (2003) research which revealed that lack of proper training and continuous skills in TQM contributed to employees' perception of TQM as irrelevant in the construction industry. Similarly, Wanderi et al. (2015) study in Rwanda found that employee training a significant determinant in TQM practice in the construction industry.

In regard to cultural barriers, the findings indicated that creating and maintaining team spirit for TQM implementation is a challenge in the construction sites was a barrier to TQM implementation to a moderate extent. Flynn et al. (1994) emphasized that TQM thrives in teamwork environment. This finding supports Saeed and Hasan (2012) study which concluded that encouraging teamwork was one of the foundations of achieving TQM in the construction industry. Erande and Pimplikar (2016) study also supported the importance of teamwork in TQM implementation. This means that lack of teamwork in the construction employees will be a hindrance to TQM implementation.

The study measured the influence of procedural barriers and found that low bid subcontracting was a barrier to TQM on construction sites to a moderate extent. This finding supports Hoonakker (2010) study among contractors concluded that the low bid culture of awarding tenders was one of most important barrier of TQM practice in the construction industry. Tey and Ooi (2014) also found that low bid mindset was a barrier to TQM implementation in the Malaysian construction industry. Low bid subcontracting is a procedural issue in the construction industry where clients and contractors seek to work with the firm with the lowest bid among several potential contractors.

The customers in the construction industry rather than pay emphasis on the value pay more attention to the cost. Construction clients often focus on firms that can do the work at a lesser cost (Harrington et al., 2012).

The study therefore concludes that procedural barriers are a hindrance to TQM practice in the construction industry in Nairobi County. The findings revealed that procedural barriers militated TQM practice among contractors in Nairobi County. The study therefore concludes that procedural barriers are a hindrance to TQM practice in the construction industry in Nairobi County.

5.3 Recommendations

The study makes the following recommendations:

1. That customer focus and management should be the focus of contractors in practicing total quality management in their work. Through collaborating and cooperating with the client during the construction process means that contractors can be able to meet the client quality requirements thus achieving total quality management.
2. That contractors should adopt positive attitudes towards total quality management processes and procedures in their operations. In this approach, contractors can be able to follow the total quality management steps and integrate them in their work.
3. That contractors should pay more emphasis on the needs of the client. The study recommends that contractors should deliver construction projects to the defined parameters of the client and this way they will be able to manage and achieve quality management in their activities.
4. The study recommends that contractors should promote a culture of quality management into their operations. Contractors should select sub-contractors based on their quality management experience in past projects and should give quality guidelines and instructions to subcontractors when handing jobs to them.
5. That contractors should limit the use of low bid contracting to tender for subcontractors. This study recommends that low cost should not only be the criteria for selecting subcontractors for construction projects.

6. This means that contractors should use other criteria such as history of subcontractors, quality of past projects and also reference and experience of subcontractors.

5.3 Suggestions for further Study

The study sought to investigate the effect of contractor relationship on total quality management implementation in the Kenyan construction industry. The study was limited to investigating the contractor relationship effect on TQM implementation. The study suggests for further research on other factors influencing TQM implementation in the Kenyan construction industry.

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APPENDICES

APPENDIX I: INTRODUCTORY LETTER

Njenga Robert Chege,
Strathmore University,
P. O. Box 59857-00200,
Nairobi.

To whom it may concern,

RE: QUESTIONNAIRE FOR MANAGEMENT RESEARCH PROJECT

I am a masters' student at Strathmore University currently pursuing a master of commerce degree in the school of Management and Commerce. I am presently undertaking a Management Research Project titled ***INFLUENCE OF CONTRACTOR RELATIONSHIPS ON TOTAL QUALITY MANAGEMENT PRACTICES IN THE KENYAN CONSTRUCTION INDUSTRY***. Attached is a questionnaire I would like you to fill. The questionnaire will take approximately 20-25 minutes to complete. Please fill in the information required in the space provided. All information shall be treated in confidentiality and will be used for purposes of this research study only. In case of any communication and information please feel free to contact the researcher through the contact information provided below.

Your participation and assistance is highly appreciated.

Yours faithfully,

Njenga Robert Chege

E-mail: robertchege@gmail.com

Mobile number: +254 721112811

APPENDIX II: QUESTIONNAIRE FOR CONTRACTORS

Introduction

This questionnaire seeks information on the influence of contractor relationships Total Quality Management in the construction industry in Kenya. Kindly read and understand the questions before answering. Highest levels of accuracy and honesty will be highly appreciated. Please do not include your name or that of your company for the sake of confidentiality. All the information that you give will be used for academic purposes and nothing else whatsoever.

SECTION A: FIRM INFORMATION

1. Duration the organization has existed
 - a. Less than 5 years []
 - b. 5-10 years []
 - c. 10-15 years []
 - d. More than 15 years []
2. Size of firm in terms of permanent employees?
 - a. Less than 20 employees []
 - b. 21-50 employees []
 - c. More than 51 employees []
3. What is the ownership structure of your organization
 - a. Locally Owned []
 - b. Foreign Owned []
 - c. Local/Foreign Owned []
4. How many sub-contractors do you deal with?
 - a. Less than 5 sub-contractors []
 - b. 5-10 sub-contractors []
 - c. More than 10 sub-contractors []

SECTION B: TQM practices in the construction industry

5. State the extent to which you agree or disagree with the following statements on extent of TQM practices in your firm (*1-Very lowly practiced, 2-Lowly practiced, 3-Moderately practiced, 4-Highly practiced, 5-Very Highly Practiced*)

TQM practices in construction industry		1	2	3	4	5
1. Customer focus and management						
A	The organisation provides differentiated services to clients in their construction projects					
B	The organisation maintains close contact with client during delivery of construction projects					
C	The organisation provides indirect services to customers construction projects					
2. Process management						
a	The organisation practices continuous quality control on construction processes					
b	The organisation provides clear process instructions in ongoing construction projects					
c	The organisation conducts final inspection, review, and checking in construction projects					
3. Supplier management						
a	The organisation fosters close and long-term suppliers/subcontractors relationship					
b	The organisation relies on relatively few suppliers/subcontractors in a construction project					
c	The organisation offers long term relationship with suppliers/subcontractors in construction projects					

6. What other TQM practices have you adopted in your firm?

.....

SECTION C: Influence of contractor relationships on TQM practices in construction industry in Kenya

7. Please state to what extent do the following factors of contractor relationships influence TQM practices in your firm? *(1- To a very small Extent, 2- To a small extent, 3- To a moderate extent, 4- To a large extent and 5-To a very large extent)*

Contractor relationships						
Contractor-client relationship		1	2	3	4	5
a	The organisation focuses on customer requirements in undertaking construction projects					
b	There is effective communication between client and contractor in construction projects					
c	There is a 'teamwork' philosophy in controlling ongoing construction projects					
Contractor -subcontractor relationship						
a	Subcontractors follow contractors guide to quality of the construction project					
b	Subcontractors are interested in implementation of TQM in ongoing construction projects					
c	Subcontractors are selected based on quality of work in past construction projects					
Contractor-supplier relationship						
a	Collaborative relation with the suppliers/contractors					
b	There is less reliance on competitive tendering & formal construction projects					
c	The organisations focuses on 'supply chain' system of construction					

8. What other contractor relationships influence TQM in your construction firm?

.....

SECTION D: Barriers to the implementation of TQM in the construction industry

9. Please state to what extent these factors are barriers implementation of TQM in your firm (1- To a very small extent, 2- To a small extent, 3- To a moderate extent, 4- To a large extent and 5-To a very large extent)

Barriers to TQM implementation in construction industry		1	2	3	4	5
Employee barriers						
a	There is a lack of proper training and continuous skills for TQM implementation in construction					
b	The transient nature of workforce in construction companies hinders TQM implementation in construction					
c	Employee interest in implementation of TQM practices affects implementation of TQM principles					
Cultural Barriers						
a	Multiple stakeholders with conflicting interests in construction are a barrier to TQM implementation					
b	Sub-contractors and Suppliers interest in TQM implementation affects TQM successful implementation in construction sites					
c	Creating and maintaining team spirit for TQM implementation is a challenge in the construction sites					
Procedural barriers						
d	Too much documentation in implementation of TQM principles inhibits successful TQM implementation in construction sites					
e	Difficulty in measuring results on construction sites is problematic for TQM implementation on those sites					
f	Lack of leadership in TQM Implementation is a challenge in the construction industry					
j	Low bid subcontracting is a challenge to the successful implementation of TQM on construction sites					

**APPENDIX III: NATIONAL CONSTRUCTION AUTHORITY (NCA)
CONTRACTOR CLASSIFICATION**

NCA Levels	Contractors – Building (Kshs)	Specialist contractors (Kshs)	Roads and other civil works (Kshs)
NCA 1	Unlimited contract value	Unlimited contract value	Unlimited contract value
NCA 2	500,000,000	250,000,000	750,000,000
NCA 3	300,000,000	150,000,000	500,000,000
NCA 4	200, 000, 000	100, 000, 000	300, 000, 000
NCA 5	100, 000, 000	50, 000, 000	200, 000, 000
NCA 6	50, 000, 000	20, 000, 000	100, 000, 000
NCA 7	20, 000, 000	10, 000, 000	50, 000, 000
NCA 8	Below 20,000,000	Below 10,000,000	Below 50,000,000