EFFECT OF TOTAL QUALITY MANAGEMENT PRACTICES ON ORGANISATIONAL PERFROMANCE IN INTERNATIONAL RESEARCH ORGANISATION IN KENYA

By

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A Research Project Submitted in Partial Fulfilment of the Requirements for The Degree of Master of Business Administration

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DECLARATION

This is my original work and has not been submitted for examination in any other University.

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This research proposal has been submitted for evaluation with my approval as the University Supervisor

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ACKNOWLEDGMENT

I wish to acknowledge the entire team of the Maseno University for the support they gave me. It was worth this development and completion of this study. Their guidance, motivation and encouragement was invaluable.

My utmost appreciation is to my supervisor, Dr. Fredrick Aila, for his patience, understanding and guidance. He took time to review my paper adequately and give instructions.

Am pleased to acknowledge the panel of Maseno University who reviewed my paper and gave their constructive criticisms and raised valid points.

Finally, I sincerely appreciate my employer's permission to conduct this study in her organization. This would not have been possible without their support in granting me the opportunity to conduct my research without several interferences. This appreciation is also extended to all the staff who helped me in the administration processes of this study.

DEDICATION

I dedicate this work to my dearest mother, son and daughter, for their understanding, encouragement and love throughout the study period.

ABSTRACT

Total Quality Management (TQM) describes a management approach to long term success through organisational performance. It is a widely implemented strategic tool for ensuring business performance and transforming organisations. In Kenya, empirical evidence indicates that many organizations in manufacturing, service industry and educational sector have successfully implemented TQM. This evidence is however lacking for international research organizations. TQM is central to quality service delivery, cost effectiveness, people management and resource mobilization all of which are critical for international research organizations. The main objective was to assess the effect of TQM practices on international research organizational performance. Specific objectives were to: establish effect of top management commitment on organizational performance; determine effect of strategic and systematic approach to organizational performance; establish the effect of integrated system; and assess the effect of continuous improvement on organizational performance. This study was guided by the European Foundation for Quality Management (EFQM) model which was implemented using a cross-sectional research design. This study was carried out to assess the existing systems of TQM that ensured high organizational performance. This study was purposed to bring in new knowledge in quality management systems. The study sought to explore the effects of TQM practices in an IRO in relation to enhancing the performance in the IROs in Kenya. The study adopted cross-sectional research design. The target population comprised research scientists, technical staff and scholars, heads of business units and officers working under the units whose total number was 71. Five respondents of the total sample were used to measure reliability of the data. The sample size of 71 respondents was drawn using stratified random sampling. Questionnaires were used to collect primary data. The study findings of correlation analysis showed that top management commitment had 0.061 R^2 with p-value of 0.411, strategic and systematic approach 0.145 R^2 with p-value of 0.107, integrated systems had 0.217 with p-value of 0.022 and continuous improvement had 0.231 R2 with p-value of 0.012. The results indicated that the overall performance of TQM practices was positively significant to integrated system and continual improvement hence positively affectedj the organisational performance. This study concludes that although, top management commitment was not significant to organisational performance; strategic and systematic approach was also not significant to organisational performance, in general the two elements of TQM accounted for the total R^2 of 48%. Integrated systems were positively significant to organisational performance; and continuous improvement was positively significant to organisational performance. It also indicates that TQM elements cannot work in isolation but as a group. This study recommends a further study to establish the reason why there is no significance on top management commitment and strategic and systematic approaches since they positively contributed to the overall performance. It is evident that integrated systems within organisation is an integral part of the organisational performance. The continual improvement keeps an organisation on toes with the new technology, creativity and innovativeness. The management of the organization should consider fully empowering and training employees in order to motivate them to continue performing to achieve the goals of the organization.

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Abbreviations and Acronyms

TQM	Total Quality Management
QMS	Quality Management Systems
EDP	Energias de Portugal
CI	Continuous Improvement
MS	Management Systems
GxP	Good Practice
R & D	Research & Development
RBS	Research Business Support
TMC	Top Management Commitment
SSA	Strategic and Systematic Approach
IS	Integrated Systems
CI	Continuous Improvement
OP	Organisation Performance

Operational Definition of Terms

Organizational Performance - Relates to how the organization works together to achieve the results.

Top Management Commitment - Plays a vital role in implementing quality management system.

Strategic and Systematic Approach - Ensures that quality becomes the core aspect of all business processes.

Integrated System - Refers to functional specialties organized into vertically structured units, it is the horizontal processes interconnecting the functions that are the focus of TQM.

Continuous Improvement - Drives an organization to be both analytical and creative in finding ways to become more competitive and more effective at meeting stakeholder expectations.

CHAPTER ONE

INTRODUCTION

This chapter contains background of the study, statement of the problem, research gap, scope of the study, purpose and specific objectives of the study, justification of the study and conceptual framework.

1.1 Background of the Study

Total Quality Management TQM, describes a management approach to long term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services and the culture in which they work. TQM can be further summarized as a management system for organizational performance that involves all employees in continual improvement. This uses strategy, data, and effective communications to integrate the quality discipline into the culture and activities of the organization.

The intensity of global competition has led to significant changes in how organizations conduct their businesses (Al-Rfou, 2012). Providing a higher quality service as a strategy for meeting quality standards has become imperative for organizations and senior managers around the world. Quality therefore is a strategic tool for measuring business performance in today's dynamic environment (Hassan, 2012). With the recent trend in global businesses, total quality management (TQM) has been widely implemented throughout the world. Organizations have been using TQM extensively since the 1920's thus many firms have arrived at the conclusion that effective TQM application can improve their capabilities and provide strategic advantages in the world market (Korankye, 2013). Current emphasis on TQM is on cost-cutting, national and global competition, value for money, and increased use of information technology to speed up processes, continuous improvement and innovation.

TQM authorities like Joseph Juran (1950's); Edward Deming (1950's) and Philip Crosby (1980's) have put forth several approaches to improve the organization's performance. The Deming's (1986) approach concerns the creation of an organizational system that fosters cooperation and learning for facilitating the implementation of process management practices. Ishikawa (1985) believes that a commitment to continuous improvement can ensure that people will never stop learning. The theory advocates for employee participation

as the key to the successful implementation of TQM. Crosby (1979) also identified several important principles and practices for a successful quality improvement program, which include management participation and responsibility for quality, employee recognition, education, reduction of the cost of quality (prevention costs, appraisal costs, and failure costs), emphasis on prevention rather than after-the-event inspection, doing things right the first time, and zero defects. Feigenbaum (1991), on the other hand, defined TQM as an effective system for integrating the quality-development, quality-maintenance and quality-improvement efforts of the various groups in the organisation to enable marketing, engineering, production, and service at the most economical levels which allow for full organizational performance.

In light of these theories, a 67-European Member Foundation established a European Foundation for Quality Management (EFQM) in 1989 to increase the competitiveness of the European economy. The Quality Model of Excellence was then awarded in 1991 to support, encourage and recognize the development of effective TQM by European firms. In the United States of America, Malcolm Baldrige advocated for quality management as key to American Companies' prosperity and sustainability. In 1987, the Malcolm Baldrige National Quality Award was named after its founder. Its main purpose came into being to encourage American firms to improve quality, satisfy customers, and improve overall performance and capabilities. Since then, these two models have been applied in in various organizations. Empirical studies have been conducted to compare educational criteria in Higher Education Institute using EFQM and MBNQA models (Osseo-Asare and Longbottom, 2002). Most of business excellence models which were inspired by either the MBNQA or the EFQM have been used thus the models underlying these awards encompass the adoption of a collection of best quality management (QM) practices and the measurement of stakeholder-related performance (Escrig and Menezes (2016). It is proven that these models have contributed immensely towards clarifying and disseminating TQM in Europe (Dahlgaard-Park, 2008).

Following these developments, TQM has become a global phenomenon by receiving a great attention worldwide (Jung & Wang, 2006). Over the years, TQM has gained importance in industrialized countries all over the world (Munir & Elhuni, 2014), and most organizations in Europe, the USA, Japan and Australia now towards improving the key components of human resource management, leadership, customers service, and strategic planning (Elmghadmi, 2016). In Kenya, many organizations especially at the service industry have

embraced quality management techniques such as ISO standards and TQM programs. For example, most government parastatals and Public Universities in Kenya are currently ISO certified (Kenya Bureau of Standards, 2014). It has been pointed out that some elements of TQM are not adhered to making it less effective to address the challenges to quality. Despite the existence of quality policy across organizations in Kenya, concerns have been raised over the lack of implementation of TQM across organizations (Kyalo, 2015).

As has been defined by many scholars, TQM is a management philosophy and practice that aims to harness the human and material resources of an organization in the most effective way to achieve the objectives of the organization (Chin, 2004). It has been proven as an efficient process of organizational advancement and its function is universal and well-justified implementation process. As a process, it represents a series of changes and it should be understood as labour philosophy exerting influence on shaping business organization (Boljevic, 2007). Therefore, this is how organizations achieve their main and basic goals in organisational performance with the help of the people. The teams that establish the following principles are appropriately authorized employees, support of culture and internal awarding by means of continuously improving procedures as well as the aid of the system by understanding systems operations and its continuous advancement. TQM application brings about important organizational changes and changes in the organizational culture.

The end-goal is that organizations strive for excellence and performance. Empirical studies have indicated that TQM improves organization's performance through quality service delivery and productivity thus enabling organizations to have a competitive edge over its competitors. To be successful, Quality Management (QM) practices is an integral part of any organization's strategic management (Matata and Wafula, 2015). Organizational performance focuses on the quality performance and operational performance of the firm. On the other hand, organizational performance has the items relating to customer satisfaction, employee morale, productivity, quality of output and delivery performance (Hassan *et al*.,2013). In Kenya, many some organizations implement TQM and producing quality service to enhance productivity (Bahri, 2012 and Saad, 2014). Quite a number of studies have been conducted in various sectors. However, there is little or no empirical study carried out in international research organizations.

1.2 Statement of the Problem

TQM is the basic requirement for an optimum performance in an organization. In regard to this, performance relies on several factors that define it to the letter. The factors include, culture of the organization, employees' empowerment and quality practices as well as every aspect surrounding the organization. In every sector or industry, quality is crucial and international research organizations are not exempt. TQM is central to quality service delivery, cost effectiveness, people management and resource mobilization. The running of the IRO all depends on the coordination and cooperation of the quality systems. The mandate of IRO is quite different from that of educational organizations even though they share research component. IRO's mandate is to conduct research that are effective and environmentally safe and work towards improving the lives and livelihood of the communities in Africa. Identifying how the systems of TQM work to achieve the higher performance is therefore essential for the IRO. This study was determined to seek after the existing systems of TQM that ensured a higher performance.

1.3 Objectives

The main objective of the study will be to examine the effect of total quality management and organizational performance at *icipe.*

The specific objectives of the study are to:

i. Establish the effect of top management commitment on organisational performance at *icipe.*
ii. Determine the effect of strategic and systematic approach on organizational performance at *icipe.*
iii. Analyse the effect of integrated system on organisational performance at *icipe.*
iv. Establish the effect of continuous improvement on organizational performance at *icipe.*

1.4 Research Hypotheses

The study will test the following hypotheses:

H_{01}: Top management commitment has no effect on organizational performance

H_{02}: Strategic and integrated approach has no effect on organizational performance

H_{03}: Integrated system has no effect on organizational performance

H_{04}: Continuous improvement has no effect on organizational performance

1.5 Scope of the Study

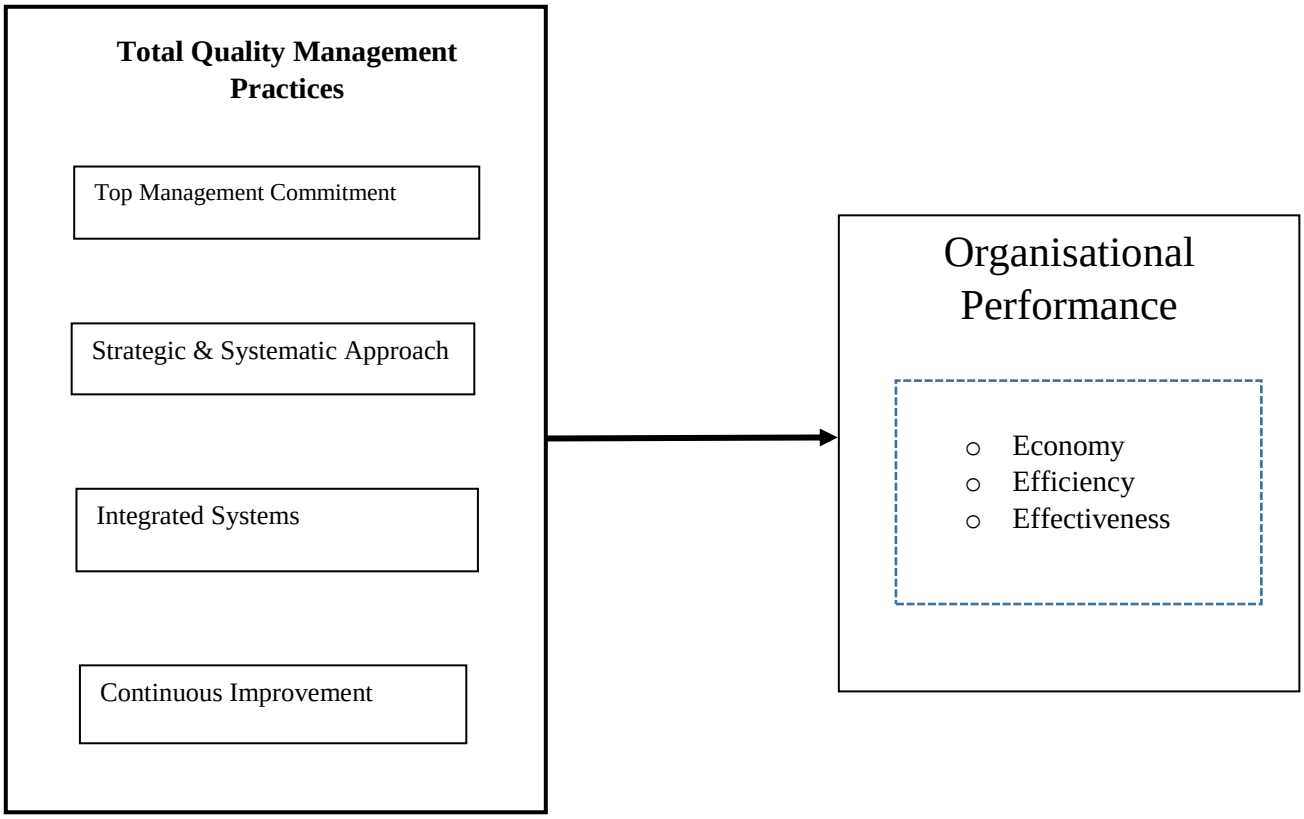
The study examined the TQM approaches and the performance effects in the International Research Organisation with focus at *icipe*. The study targeted two major areas namely research and development themes/units and business research units. The study commenced in April 2017 to October 2017.

1.6 Justification of the Study

TQM in research organizations was less studied and looked at IROs had been the drivers of science and technology, a key component of economic development for any country. IRO contributed immensely in the capacity development of African scientist focused on developing home-grown solutions for the continent. IRO brought together local and international expertise creating a platform for multinational partnerships that had been beneficial for Kenya. Conducting this study purposed to bring in new knowledge in quality management systems. This study sought to explore the effects that TQM practices in an IRO in relation to enhancing the performance in Kenya.

1.7 Conceptual Framework

The conceptual framework in the figure below shows the variables of this study and the expected results on the organizational performance. In finding the effects of TQM, a model independent variables and dependent variables were deemed important to lead the study. They dependent variable gave the effect of the independent variables. Finding the organizational performance was dependent of four variables that included; analysis of top management commitment, strategic and systematic approaches, integrated system and continuous improvement. This aided in understanding the relationship between the variables of the study.



Source: Westcott (2013) in American Society for Quality

***The Certified Manager of Quality/Organizational Excellence Handbook*, pages 291-292.**

CHAPTER TWO

LITERATURE REVIEW

This chapter presents research carried out by various authors, scholars and researchers related to the research topic. The areas covered under this section are theoretical framework of the study, discussions on the concepts of both total quality management practices and organizational performance.

2.1 Theoretical Literature Review

A theoretical framework is a model showing the logical relationship among several factors that are identified as important to the problem (Sekeran, 2003). However, the relationship can be generally explained as independent and dependent variables, where the former explains the variations in the latter. In this study, the theoretical framework will determine the components of TQM including top management commitment, customer-focus, total employee involvement, process-centred, integrated system, strategic and systematic approach, continuous improvement, fact-based decision-making and communication all of which are critical for organizational performance. In this study, top management commitment, strategic and systematic approach, integrate system and continuous improvement were chosen being that these components are relevant to research organization. The study will adopt the European Foundation Quality (EFQM) model.

2.2 European Framework for Quality Management (EFQM)

The EFQM framework is a heuristic complex of notions and ideas about general relationships between leadership and business results (Dijkstra, 1997). The EFQM model (1991) is divided into two sections namely five enabler domains and four result domains. The enablers are leadership, policy and strategy, people management, resources and processes. Results domain include customer satisfaction, people satisfaction, impact on society and business results. The EFQM Excellence Model was introduced at the beginning of 1992 as the framework for assessing organizations for the European Quality Award. It is now the most widely used organizational framework in Europe (Eskildsen and Dahlgaard, 2000). The model acknowledges that there are many approaches to achieving sustainable excellence in all aspects of performance, and is based on the premise that excellent results with respect to performance, customers, people and society are achieved through leadership

driving policy and strategy that is delivered through people, partnerships and resources, and processes (EFQM, 2002).

The EFQM Excellence Model measures the organization's performance in terms of TQM applications. This model is a self- assessment framework for evaluating the strengths and weaknesses of the organizations. Self-assessment is comparing activities and results of the organization with the excellence model (Hillman, 1994). A research carried out in 177 companies to determine strengths and improvement areas in order to develop their improvement plans which should be included in organizational strategic plan (Dale et al., 2000). The EFQM Excellence Model includes all the prominent areas of the organization and it explains how the needs should be applied in these areas.

2.3 Effect of Top Management Commitment on Organizational Performance

Vouzas and Psychogios (2017) in Greece analyzed the rationale and the development of a measure that can be used in assessing managerial awareness and understanding of the concept of TQM within organizations. The awareness of each one of TQM principles was investigated among 400 managers. The quantitative evidence was further analyzed by factor analysis and reliability tests. The statistical analysis provided a distinctive and consistent, statistical measurement of the soft side of TQM. The measure consists of three components of TQM namely continuous improvement and training, total employee empowerment and involvement, and quality driven culture which represent the whole concept of TQM approach. The study found that while the technical (hard) aspects of TQM are well documented and clearly measured, there is general disagreement of what exactly composes the philosophical (soft) side of TQM.

Oruma, Mironga and Muma (2014) in Nakuru County, Kenya carried out a study to determine the factors influencing implementation of TQM in construction companies in Nakuru County. Questionnaires and structured questionnaires involving the participation of over 15 construction companies were used as the main tools for this study. The findings of this study revealed that Top Management Commitment is a critical factor affecting the implementation of TQM in construction companies in Nakuru County.

Chepkech (2017) in Kenya conducted a study to determine the effect of total quality management practices on organizational performance in Kenya. The study adopted explanatory research design. The target population comprised head of departments and

tutors in the tertiary institutions within Uasin Gishu County whose total population was 421. The sample size of 264 respondents was drawn using stratified random sampling. Questionnaires were used to collect primary data. Statistical Package for Social Sciences (SPSS) was used to conduct data analysis using descriptive statistics such as mean and standard deviation, and inferential statistics such as correlation analysis and multiple regressions to test hypothesis. The study findings of correlation analysis showed that employee involvement and customer focus were positively and significantly affect organizational performance.

Out of the three reviewed studies, one study (Vousaz and Psychogios, 2007) studied managers of various organisations in Greece while the other two Oruma, Mironga and Muna (2014) and Chepkech and Cheluget (2017) studied construction industry and tertiary education in Kenya respectively. Vousaz and Psychogios studies centres on continuous improvement, training, total employee empowerment and quality driven culture to depict soft skills of top management committee. Oruma, Mironga and Muna (2014) looked at leadership, critical resources and top management involvement. On the other hand, Chepkech and Cheluget (2017), focused on employee involvement and customer focus. Whereas two studies touch on the education sector, there was no studies in international research organizations (IRO). The mandate of IRO is quite different from that of educational organizations even though they share research component. IRO's mandate is to conduct research that are effective and environmentally safe and work towards improving the lives and livelihood of the communities in Africa. The three studies merely make inferences on top management commitment without direct observation. The only attempt is albeit shrouded on top management commitment used as top management involvement is viewed alongside leadership and critical resources. Therefore, the effect of top management commitment on organizational performance in IRO is not known.

2.4 Effect of Strategic and Systematic Approach on Organizational Performance

Yunis, Jung and Chen (2013) in USA and China examined the role of TQM in a strategy-TQM-performance model. The study investigated whether TQM has a driving role in the formation of strategy or has a mediating effect in the strategy-performance relationship. The findings of the study indicated that TQM influences strategy formulation process and it is a dynamic resource that contributes to the achievement of a sustainable competitive advantage. In addition, soft TQM has a higher impact than hard TQM on competitive

strategy formulation and on performance. The findings further provided insights to the need to integrate TQM with the various stages of the strategy formulation process, with an emphasis on the soft elements of TQM including customer satisfaction, management and leadership, and employee relations.

Awino, Muturia and Oeba (2012) in Kenya conducted study on a census of 44 commercial banks in Nairobi. The majority 80% of the respondents were managers in charge of planning and 20 per cent were either heads of human resource departments or business and marketing department. Various data analysis procedures were applied including descriptive analysis, Pearson Moment Correlation Coefficient; F-statistics were used in order to accomplish the objectives of the study. Hypotheses H1, H2, H3 were tested for correlation. The study found that there is positive and significant relationship between strategic planning (seven dimensions of planning) and firm performance; strategic planning and planning outcomes and finally planning outcomes and firm performance.

Sungau, Msanjila and Ndunguru (2012) in Tanzania researched on a systematic approach aimed at guiding organizations to adopt and apply Business Process re-engineering technique on performance. Based on the literature review, a conceptual framework was developed to reflecting the relationships of Business Process Re-engineering with product quality, productivity and operational cost. The proposed conceptual framework was validated using practical and empirical data. The study found that Business Process Re-engineering influences Organizational performance by affecting organizational performance dimensions of product quality, operational cost and productivity.

Kariuki, Maiyo, Ndiku (2016) in Kenya carried out a study to determine business strategies employed by commercial banks and influence on performance by studying various business strategies. The target population of the study was 46 Commercial Banks in Kenya. Census sampling was used to select 1 senior manager from each bank. Primary data was collected using a structured questionnaire. The data was analyzed using mean and standard deviation. The study found out that banks practice both cost leadership and differentiation business strategies in their operations to varying extents.

Four studies were reviewed where one study by Yunis, Jung and Chen (2013) revealed that there is a lack of substantive research that examines the relationship between the hard and soft components of TQM on one hand and the two types of competitive strategy,

differentiation and cost leadership. Kariuki, Maiyo, Ndiku (2016) carried out their studies at Kenya Commercial Bank (KCB). The former tested the relationship on strategic planning and its seven dimensions in planning in organizational performance while the latter analyzed data using mean and standard deviation on cost leadership and differentiation and business strategies. On the other hand, Sungau, Msanjila and Ndunguru (2012), researched on a systematic approach in a service industry. Two studies focused on differentiation and cost leadership (Yunis, Jung and Chen (2013) and Kariuki, Maiyo, Ndiku (2016). Some scholars, Kariuki, Maiyo, Ndiku (2016) did not substantiate the seven dimensions of planning given that the essential for strategic management. As much as strategic and systematic approaches are crucial to IRO in that it enables the organizations to be able to achieve the organization's vision, mission, and goals, strategic plan aligns the system with the goals of the organization. No such study has been carried out in the IRO. Therefore, the effect of strategic and systematic approach on organizational performance in IRO is not known.

2.5 Effect of Integrated Systems on Organizational Performance

Owino (2015) in Kenya carried out a study on implementation of strategic integration in the firm's supply chain and its competitiveness. The study adopted a cross sectional research design. The population for the study was all the 42 commercial banks currently operating in Kenya. The study used primary data which was collected using a questionnaire. The data was analysed using the Statistical Package for Social Sciences (SPSS) software and presented using tables and figures. Regression analysis was used to find out the relationship between the demographics and use of integration in the supply chain by the banks, supply chain integration and organizational performance. The study found out that reverse logistics, knowledge management, top management support, information technology adoption, customer orientation and customer service affect performance of commercial banks.

Kibera and Orwa (2016) in Kenya conducted a study on implementation of integrated supply chain in manufacturing companies. A descriptive study design was used to collect quantitative and qualitative data. The population for the study was employees of Bidco Kenya. Out of the 300 employees a sample of 10% was used that gives used. A questionnaire was used to collect data. The study found that supply chain integration helps to improve the firm's capability because it provides a systematized way to keep up with processes, it provides cost saving, improved efficiency. In addition, it enhances flexibility and tight

inventory management that eventually leads to higher profit margins but also it brings about performance.

Mežinska, Lapiņa and Mazais (2015) in Latvia, Europe, did a research on integrated quality, environmental, occupational health and safety management systems (IMS). The study aimed at analyzing how IMS should be designed so that it can be used for building a socially responsible organization that contributes to sustainable development. Several research methods, such as the analysis of academic and professional publications, and logical and comparative analysis and a survey on the depth of IMS integration was developed and distributed among organizations in Latvia that have the IMS. The survey revealed that understanding of IMS complexity, its integration levels and possibilities vary.

Tari and Molina-Azorina (2015) in Spain identified the benefits of integrated management systems by comparing them with the benefits obtained through the individual implementation of ISO 9001 and ISO 14001 standards. Findings showed that although some benefits are common regardless of the system management type, the benefits obtained with integration are greater than considering management systems separately because of the wider scope considered in integration. This was the first research to compare benefits from the two management systems standards when implemented separately and when integrated.

Tari and Molina-Azorina (2015) in their study found out that benefits of integrated system was vast than the management systems alone while Mežinska, Lapiņa and Mazais (2015) integrated systems was more relevant in building socially responsible research methods in academia. In Kenya, integrated systems studies were carried out in the banks and construction company to establish the supply chain management (Kibera and Orwa (2016) and Owino (2015). Their findings were inter-related in that Kibera and Orwa revealed benefits on component of TQM and Owino (2015) found out that integrated systems are beneficial to organisational performance. Although Mežinska, Lapiņa and Mazais (2015) indicated a closely related the benefits in the field of research and academia, any study conducted in IRO was widely missing. Thus, the effect of integrated system on organizational performance in IRO is not known.

2.6 Effect of Continuous Improvement on Organizational Performance

Millner and Savage (2016) in the UK conducted a study that aimed at contributing to existing body of knowledge regarding how service-based organizations establish and sustain

incremental performance improvement. The study adopted an interpretive philosophy and inductive nature, using multi-qualitative methodological design. The multi-embedded case study, conducted over a three-year period, which allowed an intensive review and in-depth exploration. The study established that there are numerous obstacles faced and a wide variety of methods, tools and techniques that may be blended together under the auspices of a formalized CI programme.

Jaca, Paipa-Galeano, Viles, and Mateo (2016) in Spain described readiness programme designed to increase employees' awareness of order and cleanliness as a way of building the necessary foundation for implementing and sustaining continuous improvement processes. The authors proposed a new readiness programme based on the principles of 5S, with the aim of strengthening employees' motivation and involvement prior to 5S being implemented. The authors' findings were that the readiness programme was applied before 5S was successfully implemented. The degree of awareness and motivation of the programme participants improved as a result of these activities (5S). A 5S is the name of a workplace organization method that uses a list of five Japanese words: *seiri, seiton, seiso, seiketsu, and shitsuke*. It is the foundation of all improvements and is the key component of establishing a visual workplace. These are part of *Kaizen*, which is a system of continual improvement and a component of lean manufacturing. The 5S programme focused on having visual order, organization, cleanliness and standardization. According to the authors, these activities increased employees' motivation to participate in improvement of activities.

Jurburg, Viles, Jaca and Tanco (2015) in Spain conducted a study aimed at assessing how companies implement and organize their CI processes. The study was based on semi-structured interviews in ten high performing companies in the Basque Country, a region in northern Spain well known for its business quality. The objective was to analyze the state of their CI processes, putting special focus on how the organizational structure integrated with the CI processes and what were the characteristics of the corresponding measurement system. The study revealed that there was lack of company-wide focus on CI, little written evidence of previous improvement activities, unclear improvement process owner, and poor use of adequate measurement systems to monitor CI.

Millner and Savage (2016), established obstacles faced together with variety of methods, tools and techniques that can be blended to a formalized CI programme. Whereas, Jurburg, Viles, Jaca and Tanco (2015), revealed that there was lack of company-wide focus on CI,

there were little evidence of previous improvement activities and adequate measurement systems to monitor CI. Jaca, Paipa-Galeano, Viles, and Mateo (2016), focused on 5S for CI. Given the aforementioned, CI as a component of TQM is missing in IRO. Hence, the effect of continuous improvement on organizational performance in IRO is not known.

2.7 Summary and Research Gap

The study presents literature review with the theories of EFQM and MBNQA models being discussed. The discussions confirmed how each of the two models form a theoretical basis for this study by highlighted various studies done by scholars, researchers and authors. Based on the empirical literature review, there are mixed findings on relationship between TQM and organizational performance. One study revealed a weakness in regression analysis between the TQM variables on test-retest coefficient of determination. In contrast, another study found that quality management practices have a strong positive correlation with an organization's performance. Some researchers' findings indicated that only training and empowerment has a significant impact on financial performance and corporate social responsibility; leadership commitment, quality control and inspection have a significant impact on cost reduction but the TQM practices appeared not to have a significant effect on customer satisfaction. This indicates that even though TQM has become well known and majority of firms practice, some of them have not fully adopted it. In Kenya, limited or no research has been conducted in IRO to determine the effects of TQM on organizational performance.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discusses the research methodology applied in carrying out this research. The chapter gives the highlight of what informed the selection of the research design, how the sample population was selected and the method used for sampling. It also describes the instrument that was used to collect data, and how the data was analysed and interpreted.

3.1 Research Design

This research took a form of cross-sectional study, a type of observational study that analyses data collected from a population, or a representative of a subset at a specific point in time. Cross-sectional studies typically involve the use of correlational survey designto sort out the existence and magnitude of effects of one or more independent variables upon a dependent variable of interest at a given point. This study compared the effect of total quality management variables on organizational performance measures.

3.2 Study Area

The study was carried out at the International Centre for Insect Physiology and Ecology *(icipe*) campus located at Kasarani area, Nairobi whose GPS coordinates are -1°13.3631 latitude and 36°53.7867 longitude and *icipe* Thomas Odhiambo Campus, GPS coordinates; 0°41'59.99" N latitude and 34°19'60.00" E longitude.

3.3 Target Population

Gall *et al*, (1983) defines a target population as the members of a real or hypothetical set of people, events or objects to which the researcher intends to generalize the results of the research. Cooper and Schindler (2003), assert that population is defined as the total collection of elements used to make inferences. The target population for this study were the employees of *icipe* namely, technical research staff, finance staff and human resource staff and research scientists drawn from various research themes and units. A random sample of respondents were drawn from each staff category which were principally grouped into two broad groups; Research Business Support (Finance and HR) and Research & Development (research scientists, technicians and post-graduate research students) (Table 3.3). All these groups are directly affected by total quality management practices which in turn affects organisational performance. Voorhis and Morgan (2007) state that to determine

a reasonable sample size of 5 is acceptable as a rule of Thumb. A sample size of 60 respondents will suffice.

Table 3.3 Sample size determination

Category of staff	Population	Population	Proportions of sample size
Research Business Support (Finance and HR)	50	33.8%	24
Research & Development (Research Assistants, Technical Staff and Scholars)	180	66.2%	47
Total	**230**	**100%**	**71**

Source: icipe Record (2017)

3.4 Sampling Techniques

Kothari (1990) states that sampling is the process by which a relatively small number of individuals, objects or events is selected to find out something about the entire population from which it was selected. A sampling frame is a list or other device used to define a researcher's population of interest. The sampling frame defines a set of elements from which a researcher can select a sample of the target population (Lewis-Beck, Bryman and Liao, 2004). In this study, the target population was stratified into two large groups: groups; Research Business Support and Research & Development (Table 3.4) and a random sample of employees was drawn from each group (Table 1.). Stratified random sampling technique is suitable as it gives each respondent in the two groups an equal chance of being selected and ensures the groups are represented.

3.5 Data Collection Methods

Data was collected using a structured questionnaire where Likert-scale was used to measure attitudes of employees ranging from negative (Strongly disagree) to positive (strongly agree) on total quality management practices and organisation performance measures. A five-point Likert scale was used to measure attitude of employees as follows: Strongly disagree = 1, Disagree = 2, Moderately agree = 3, Agree = 4 and Strongly agree = 5. Survey

respondents were then to choose the response option that best reflects their attitude on the statements measuring total quality management practices and organisational performance. The questionnaire was used to collect both qualitative pertaining to demographic characteristics of respondents and quantitative data measured on Likert scale. A brief introduction was included as a first paragraph in the questionnaire explaining the aim of the survey and a narrative assuring respondents on confidentiality. The developed questionnaire is as Appendix II.

3.5.1 Other sources of Data

While the questionnaire provided primary data, secondary data were obtained from literature of similar studies.

3.5.2 Reliability Test for Data Collection Instrument

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 2003). In this study, reliability was determined by a test-retest using a sub-sample of 5 respondents who were taking part in the survey. The test retest procedure was used to estimate reliability using correlations of summated scores administered to sub-sample of respondents on two different occasions. The estimated correlations are in Table 4.3. Spearman's r values were consistently high for the four variables on total quality management practices; top management commitment, strategic and systematic approach; integrated systems and continuous improvement. The lowest correlation coefficients, though still indicative of moderate strength correlation was for organization performance variables as measured by 'efficient use of organizational resources' and 'effectiveness in achieving objectives and goals of the organisation'. According to Cade *et al*. (2001), large correlation coefficient defined as 0.5 or greater indicates that reliability is high. This implies that the questionnaire worked well except for the subjective organisational performance measurement variables which overall had a correlation of 0.63.

Table 2. Spearman's r and median for the test and re-test responses based on sum of scores for each variable

Variable	Spearman's r (test vs re-test)	Median total score (test)	Median total score (re-test)
Top management commitment	0.67	11	10
Strategic and Systematic Approach	0.76	11	10
Integrated systems	0.76	12	12
Continuous improvement	0.95	12	11
Organisation performance - Economy	0.80	12	13
Organisation performance - Efficiency	0.19	12	11
Organisation performance – Effectiveness	0.32	13	12
Organisation performance - Overall†	0.63	38	34

† the variable is based on nine items on a Likert scale of 1-5, the rest of the variables are based on three items.

Source: Research Data, 2017

The reliability test results suggest that efficiency and effectiveness as a measure of organisational performance is highly unmeasurable and any scores obtained would be highly subjective and were left as nothing else could be done about them.

3.5.3 Validity Test for Data Collection Instrument

Validity refers to the degree to which a measure accurately represents what it is intended to measure. There are different types of validity but in this study, we considered content validity, (Nunnally, 1978). Mugenda and Mugenda (2003) describes validity as a degree to which data collected using instrument represents a domain of indicators of a concept. To measure measure validity, expert panel were given the question, "Is the question "essential" to the intended measurement? The panel of subject matter experts (SME) are expected to answer 'Yes' or 'No. The content validity ratio (CVR) originally proposed by Lawshe (1975) and Ayre and Scally (2014) was used to quantify content validity. The CVR is a linear transformation of a proportional level of agreement on how many "experts" within a panel rate an item "essential" calculated in the following way:

$$CVR = \frac{n_e - (N/2)}{N/2}$$

where CVR is the content validity ratio, *ne* is the number of panel members indicating an item "essential," and N is the number of panel members.

3.5 Data Analysis

Duly filled questionnaires were checked for completeness and consistency. A database was created in MS Excel and data were checked for any errors and omissions. A non-parametric Spearman's r correlation between variables measured on Likert scale was obtained to study the association between variables. Cronbach's alpha was calculated to study the internal consistency of the items/statements in the questionnaire. Multiple regression was used to evaluate the effect of total quality management practices on organisational performance using the model:

$$OP= \beta_0 + TMC + SSA + IS + CI + \varepsilon$$

Where β_0 is the constant or intercept,

$\beta_1 - \beta_4$ are the regression coefficients (change in Y, given one unit change in X).

Y is the dependent variable (Organizational Performance),

X_1 is, Top Management Commitment

$_2$ is, Strategic and Systematic Approach

X_3 is, Integrated System

X_4 is, Continuous Improvement

ε is, the error term

The data were analysed using Statistical Package for Social Sciences (SPSS) PC version 22.

3.8 Research Ethics

Ethics is a branch of philosophy with deals with one's conduct and serves as a person's behaviour (Mugenda & Mugenda 2003). This study observed ethical consideration while conducting research. Confidentiality of the institution and the respondents were protected. The results of the research were meant for academic purposes only. It was the intent of this study to demonstrate a commitment to high quality, transparent and accountable research ethics throughout the research period.

4.2 Demographic characteristics of respondents

4.2.1. Gender of the repondents

The respondents were asked about their gender and the responses are summarized in table 4.1 (D). It shows that the sample consisted of 52.1% male and 47.9% female. This is an indication the study was gender balanced. Landel (2015) in Mackinsey Quarterly assert that gender balance is more than a moral imperative. Gender balance is what some organisations stand for as they develop employees' careers by tapping into full potential of both men and women.

4.2.2. Age of the respondents

The age of the respondents as shown in Table 4.1 (C) indicated that 35.2% were aged 21-30 years, 38.0% were 31-40 years, 15.5% aged 41-50 years, while 13.3% aged 50 years and above. This means that the respondents had different types of experiences and views which improved the kind of data collected. This was relevant in ensuring that TQM and its effects on the organizational performance were viewed from all relevant perspectives and experiences.

4.2.3. Education Levels of the respondent

Table 4.1 (F) shows a summary of the education levels of the respondents where 21.1% had PhD level of education and comprising of research scientists and postdoctoral, 22.5% had master's degree mostly unit managers and research assistants, 45.1% had bachelor's degree and comprising of research technicians, finance and human resources officers, while those with diplomas accounted for 11.3% of the respondents. This indicates that 88.7% of the respondents had a bachelor degree and above. This means that the respondents could understand the questions in the questionnaires and relate them with the operations of the organization thus giving accurate and well-thought-out response.

4.2.4. Job category of the respondents

In table 4.1 (G), it is indicated that the survey sample comprised respondents from a wide range of job categories namely research scientists (22.5%), technical staff (36.6%), unit managers (5.6%), finance and human resources officers (F&HR officers) (29.6%), post-graduate scholars (4.2%) and administrators (1.4%). The study targeted respondents who are believed to have sound knowledge of quality standards in their areas of operation and mostly involved in the implementation of TQM and performance evaluation.

4.2.5. Years of Experience of the respondents

Table 4.1 (H) shows that 77.5% (total of 39.4 % for 2-3 years, 15.5 % for 4-5 years, 18.3% for 6-10 years, and 4.2% of those with over 10 years of experience) had 2 years of experience and above. The rest (22.5%) had below 2 years of experience. This means that the study targeted people who had served in the organization long enough to be able to understand the relationship between TQM and organizational performance. They are also serving in R & D (66.2 %) and RBS (33.8%) showing that they actively participate in research and implementation of TQM.

Table 4.1 Demographic Characteristics of respondents

	Description		**Frequency**	**Percentage**
A	Location	Duduville	46	64.8%
		Mbita	25	35.2%
B	Theme/Unit	R & D	47	66.2%
		RBS	24	33.8%
C	Age of respondent	21 – 30 years	25	35.2%
		31 – 40 years	27	38.0%
		41 – 50 years	11	15.5%
		50 years and above	8	11.3%
D	Gender of respondent	Male	37	52.1%
		Female	34	47.9%
F	Education level	PhD	15	21.1%
		Masters	16	22.5%
		Bachelors	32	45.1%
		Diploma	8	11.3%
G	Job category of respondents	Research Scientists	16	22.5%
		Technical Staff	26	36.6%
		Unit Managers	4	5.6%
		F & HR Officers	21	29.6%
		Administrators	1	1.4%
		Scholars	3	4.2%
H	Years of service	Less than 2 years	16	22.5%
		2-3 years	28	39.4%
		4 – 5 years	11	15.5%
		6 – 10 years	13	18.3%
		More than 10 years	3	4.2%

Source: Research Data, 2017

4.2 Distribution of Likert-scale Responses

All individual statements pertaining to total quality management practices, were largely scored as 4 (Agree) and 5 (Strongly agree) majority of the respondents (60.6% - 93.0%) except for the statement 'Employees are empowered on their jobs" which was scored 4 (Agree) or 5 (Strongly agree) by only 45.1% of the respondents. The statement 'our organization collaborates with various partners to access resources not available internally' as a latent variable for organizational performance was scored 4 (Agree) or 5 (Strongly agree) by 93.0% of the respondents. This means the employees understand the concept of quality standards, they are aware of the existence and practices thus it is clear that the organization is performing well in TQM.

Table 4.3 Distribution of responses on Likert scale for total quality management practices and organization performance measures

Practices	Strongly Disagree	Disagree	Moderately	Agree	Strongly Agree
Drives a culture of quality	2	1	14	34	20
Embraces effective communication	5	5	10	31	20
Employees are empowered	6	3	30	31	1
Employees are aware of mission and vision	0	3	11	33	24
We develop strategic plans for the organization	1	7	16	34	13
Organization has put in place working procedures	0	3	12	31	25
Fosters an environment where diverse individuals can work together effectively	0	2	10	31	28
Employees understand the inter-unit relationship	2	2	19	38	10
Systems integration is continuously improved	1	7	19	34	9
Undertakes regular audits	0	3	13	32	22
Employees are highly committed to quality improvement	1	1	18	34	16
Organization is keen about creativity and innovativeness	2	0	15	40	14
Organization optimally uses available resources	1	1	12	43	14
Organization collaborates with various partners to access resources not available internally	0	0	5	34	32
Organization governance structure provides prudential oversight over the resources	2	1	16	38	14

Organizational resources are applied for intended purposes only	0	1	18	38	14
Employees are efficient in their operation	0	2	10	47	12
Organization develop people for optimal performance	2	3	22	34	10
Continually achieve our broad organizational objectives	0	1	12	42	16
Our objectives meet and exceed expectations of our stakeholders	0	2	21	35	13
We have a clear focus on both medium and long-term perspectives of organization	1	3	8	41	17

Source: Research Data, 2017

4.4 Correlation between variables of total quality management

There was significant correlation between the mean scores on total quality management practices including total management commitment, strategic and systematic approach, integrated systems and continuous improvement (Table 4.2). Particularly, integrated systems were strongly associated with top management commitment (Spearman's R = 0.66) and strategic and systematic approach (Spearman's R = 0.64). On the other hand, Spearman's R between the organizational performance measures were statistically significant and all correlations were above 0.5 (Table 4.2).

Table 4.2 Spearman's correlation coefficient, mean score and Cronbach's α for the variables on TQM practices and organizational performance

Variable	1	2	3	4	5	6	7	Mean	Cronbach's α
Top management commitment	1							3.67	0.84
Strategic and Systematic Approach	0.482***	1						3.97	0.58
Integrated systems	0.658***	0.636***	1					3.85	0.72
Continuous improvement	0.486***	0.422***	0.497***	1				3.95	0.56
Organisation performance – Economy	0.399***	0.501***	0.539***	0.258*	1			4.07	0.66
Organisation performance – Efficiency	0.406***	0.530***	0.448***	0.475***	0.575***	1		3.85	0.32
Organisation performance – Effectiveness	0.345**	0.341**	0.488***	0.451***	0.534***	0.584***	1	3.95	0.73
Organisation performance - Overall	0.445***	0.550***	0.591***	0.459***	0.826***	0.823***	0.849***	3.96	0.82

Source: Research Data, 2017

4.3 Total Quality Management and Organisational Performance

This section addresses the relationship between the TQM and the resulting organisational performance in international research organisation. It assesses the correlation and regression analysis on the mean scores of TQM and OP.

Table 4.3: Total Quality Management Practices

Variable	Observation	Mean	Std. dev.
TMC	71	3.671	0.562
SSA	71	3.971	0.631
IS	70	3.847	0.675
CI	70	3.947	0.599
Mean	71	4.065	0.573

Source: Research Data, 2017

The analysis of the effect of total quality management on the performance of the organization was done using multiple regression analysis with organizational performance as the dependent variable and total quality management as the independent variable. The independent variables under TQM included Top Management Commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement. The dependent variable organizational performance was measured using three variables including economics measure, efficiency measure, and effectiveness measure. The descriptive statistics of the responses are shows in Table 4.3.

The respondents agreed that top management commitment drive a culture of quality, embrace effective communication and empower employees with a mean of 3.671 and a standard deviation of 0.562. They had also agreed that the organisation adhered to strategic and systematic approach by employees being aware of the mission and vision of the organisation, the organisation develops strategic plans and puts working procedures in place with a mean of 3.391 and standard deviation 0.631. The respondents agreed the organisation supports integrated systems by fostering an environment where diverse individuals work together effectively, employees understand inter-unit relationship, and that the systems integration is continually improved with a mean of 3.847 and standard deviation of 0.675. The respondents agreed that there is continuous improvement by ensuring that regular audits are conducted, employees are urged to commit themselves to quality improvement, and the

organisation is keen about creativity and innovative with a mean of 3.947 and standard deviation of 0.599.

4.3.1 Effect of Top Management Commitment on Organisational Performance

The economic measure of performance was regressed against top management commitment, strategic and systematic approach, integrated systems, and continuous improvement and the results are shown in table 4.4

Table 4.3.1: Model 1: Economy = F (TMC, SSA, IS, CI)

	F (4, 64)	8.81	R^2	0.3551
	P-Value	0.0000		
Variable	Coefficient	s.e	t-value	P-value
Constant	1.625	0.47	3.44	0.001
Top management commitment	0.132	0.10	1.35	0.181
Strategic and Systematic Approach	0.189	0.12	1.62	0.111
Integrated systems	0.182	0.12	1.49	0.141
Continuous improvement	0.130	0.12	1.10	0.275

s.e is the standard error **Source: Research Data, 2017**

The regression analysis in Table 4.4 shows that the three variables of TQM on top management commitment, Strategic and systematic approach, integrated system and continuous improvement were not individually important determinants of economic measure of organizational performance. The p-values of their t-statistics were less than 5 per cent level of significance meaning that the null hypothesis that the variables were not important determinants of economic measure of performance could not be rejected. This is a departure from the findings of Chepkech (2017) that TMC were significant in employee involvement and customer-focus and improves performance. The coefficient of determination R-squared was 0.3551 meaning that Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement explained 35.51% variation in the economic measure of organizational performance. The p-value of F-statistics was 0.0000 meaning that the variables Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement were jointly important determinants of economic measure of organizational performance.

4.3.2 Effect Strategic and Systematic Approach on Organisational Performance

The efficiency measure of performance was regressed against Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement and the results are shown in table 4.5.

Table 4.3.2 Model 2: Efficiency = F (TMC, SSA, IS, CI)

	F (4, 64) 9.45	P-Value 0.000		
	R^2	0.3713		
Variable	Coefficient	s.e	t-value	P-value
Constant	1.463	0.406	3.61	0.001
Top management commitment	0.030	0.084	0.36	0.721
Strategic and Systematic Approach	0.234	0.100	2.33	**0.023**
Integrated systems	0.106	0.105	1.01	0.314
Continuous improvement	0.238	0.101	2.35	**0.022**

s.e is the standard error Source: ***Research Data, 2017***

The results in Table 4.3.3 showed that Strategic and Systematic Approach (SSA) and Continuous improvement (CI) were important determinants of efficiency measure of organizational performance. The p-values of their t-statistics were less than 5% level of significance (0.023 and 0.022 respectively) leading to rejection of null hypothesis that the variables were not important determinants of efficiency. The study is in agreement with the findings of Støle & Ekeren (2015) that lean continuous improvement is a great contributor to increased efficiency in an organization. The findings of Cesarotti & Spada (2009) that systematic approach is vital in identifying and eliminating waste indicates that systematic approach is vital in improving efficiency in lean management, hence consistent with the findings of this study. Total management commitment (TMC) and Integrated systems (IS) were not important determinants of efficiency with p-value 0.721 and 0.314 respectively. However, with p-value of F-statistics equal to 0.0000, it shows that the four variables were jointly important determinants of efficiency. The coefficient of determination (R-squared) of 0.3713, it showed that Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement explained 37.13% of variation in the efficiency measure of organizational performance.

4.3.4 Effect of Integrated Systems on Organisational Performance

The effectiveness measure of performance was regressed against top management commitment, strategic and systematic approach, integrated systems, and continuous improvement and the results are shown in table 4.3.4.

Table 4.3.4 Model 3: Effectiveness = F (TMC, SSA, IS, CI)

	F (4, 64)	9.441	P-value	0.0000
	R^2	0.3741		
Variable	Coefficient	s.e	t-value	P-value
Constant	1.167	0.5	2.32	0.024
Top management commitment	0.016	0.1	0.15	0.88
Strategic and Systematic Approach	0.015	0.12	0.12	0.906
Integrated systems	0.361	0.13	2.77	**0.007**
Continuous improvement	0.326	0.13	2.59	**0.012**

s.e is the standard error ***Research Data, 2017***

Table 4.3.4 shows that integrated systems and Continuous improvement were important determinants of effectiveness measure of organizational performance with p-values of 0.012 and 0.024 respectively which were less than 5 per cent level of significance. Their coefficients were positive meaning that they had positive effects on the effectiveness of the organization. The p-values of Top management commitment, Strategic and Systematic Approach were 0.880 and 0.906 respectively meaning that they were not significant determinants of effectiveness in the organization. The p-value of F-statistics (9.41) was 0.0000 meaning that the variables in the model were jointly important determinants of effectiveness measure of performance. The variables in the model explained 37.41% of the variation in effectiveness in the organization as shown by R^2 of 0.3441.

The integrated system is a significant determinant of effectiveness in organisational performance as shown in Table 4.3.3. Owino (2015) found that knowledge management, top management support and customer focus positively affect the performance of the organisation. However, this study focused on diversity, teamwork, improvement in systems integrated. The study of Owino (2015) therefore relevance with the findings of this study.

This result concurs with the findings of Kibera and Orwa (2016) that integration of supply chain improves the organisation's capability, cost-saving and improved efficiency. Mežinska, Lapiņa and Mazais (2015) found out that integrated management systems the understanding on the integrated by many organisations vary. Thus, as organisation introduce integrated systems, it is imperative to training the employees to enhance their understanding. Tari, Molina-Arizona (2015) found out that the integrated systems were more beneficial in terms of output than fragmented systems. This study agrees with the finding of this study.

4.3.5 Effect of continuous improvement on organisational performance

The respondents agreed that there is continuous improvement by ensuring that regular audits are conducted, employees are urged to commit themselves to quality improvement, and the organisation is keen about creativity and innovative with a mean of 3.947 and standard deviation of 0.599 (Table 4.3.2). Results show CI significant determinant organisation performance when fitted both on efficiency and effectiveness as measures of the performance (Table 4.3.2 and Table 4.3.3). Milner and Savage found that continuous improvement enhances the overall effectiveness of TQM. The findings by Jurburg, Viles and Tanco (2015) established that organisations were lacking continuous improvement processes. In support of the findings, Milner and Savage (2016) stated many obstacles that organisations face thus of focus on continuous improvement. Jaca, Paipa-Galeano, Viles and Mateo concurs with the finding of the study that continuous improvement plays a role but motivating employees hence continuous improvement.

4.3.6 Effects of TQM on the overall performance of the organization

To measure the effects of TQM on the overall performance of the organization, the responses on the measures of performance (economic, efficiency, and effectiveness) were averaged and then regressed against Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement. The regression results are shown in table 4.7.

Table 4.3.6 Effect of TQM practices TMC, SSA, IS and CI on overall performance Measures

	F (4, 64)	14.74	p-value	0.0000
	R^2	0.4834		
Variable	Coefficient	s.e.	t-value	P-value
Constant	1.420	0.357	3.97	0.000
Top management commitment	0.061	0.073	0.83	0.411
Strategic and Systematic Approach	0.145	0.088	1.64	0.107
Integrated systems	0.217	0.093	2.34	**0.022**
Continuous improvement	0.231	0.089	2.58	**0.012**

s.e is the standard error ***Source: Research Data, 2017***

Table 4.7 showed that integrated systems and Continuous improvement were important determinant of overall performance of the organization. Their p-values were 0.022 and 0.022 respectively which were less than 5 per cent level of significance. The study concurs with Tari, Molina-Arizona (2015) that the integrated systems were beneficial in improving output and Kibera and Orwa (2016) that integration of supply chain improves the organisation's capability, cost-saving and improved efficiency. Top management commitment and Strategic and Systematic Approach were not important determinants of overall performance of the organization with p-values of 0.411 and 0.107 respectively greater than 5%. The measure of overall significance F-statistics (14.74) had a p-value of 0.0000 meaning that the variables Top management commitment, Strategic and Systematic Approach, Integrated systems, and Continuous improvement were jointly important determinants of overall performance of the organization. The results are in concurrence with Owino (2015) study that knowledge management, top management support and customer focus positively affect the performance of the organisation despite top management commitment not being individually significant. The study differs from Sungau Msanjila and Ndurunguru (2012) that systematic approach leads to business re-engineering influences organisational performance, although the indirect role of Strategic and Systematic Approach is affirmed by overall significance. It can be concluded from these analyses that TQM influences the performance of the organization.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents the summary of the findings, and highlight on the conclusion and recommendation aimed at achieving the research objectives, limitations of the study and suggestions for further studies.

5.1 Summary of the Findings

The study sought to investigate the effects of total quality management on the organizational performance of the organization. The specific objectives included to: establish the effect of top management commitment on organizational performance, determine the effect of strategic and systematic approach on organizational performance, find out the effect of integrated system on organizational performance, and establish the effect of continuous improvement on organizational performance. Organizational performance was measured by economic measure, efficiency measure, and effectiveness measure. Each of these measures of organizational performance were regressed against the four components of total quality management to achieve the study objective.

Four regression analyses were conducted with top management commitment, strategic and systematic approach, integrated systems, and continuous improvement as the independent variables and economic measure, efficiency measure, and effective measure appearing as independent variables each at a time. The fourth regression analysis was done with overall performance (average of economic measure, efficiency measure, and effective measure) as the dependent variable.

To achieve the first objective, the effect of top management commitment on economic, efficiency, effective measures of organization performance, and overall performance was analyzed. Top management commitment was not found to be an important determinant of economic measure of performance, efficiency measure of performance, effectiveness measure of performance, all the three on overall performance. This was contrary to the findings of Chepkech (2017) that top management commitment improves performance. However, it was found that top management commitment combined with strategic and systematic approach, integrated systems, and continuous improvement would significantly influence the measures of performance and overall performance.

To achieve the second objective, the effect of strategic and systematic approach on organizational performance through economic, efficiency, effective measures of organization performance as proxies of performance, and overall performance was analyzed. Strategic and systematic approach was found to have a positive significant influence on the efficiency measure of organizational performance. However, strategic and systematic approach was not found to be an important determinant of economic measure, effectiveness measure, or overall performance. However, combining strategic and systematic approach with other components of total quality management, the overall effect on organizational performance and the three measures of performance was significant.

The third objective was achieved by analyzing the effect of integrated system on organizational performance using economic, efficiency, and effectiveness as measures of organization performance, and the effect on overall performance was also analyzed. It was found that integrated systems positively and significantly affected effective measure of performance and overall performance. Its effects on economic and efficiency measures of performance were found to be statistically insignificant. While implemented together with other components of total quality management, the overall combined effect was statistically significant.

The fourth objective was achieved by investigating the effects of continuous improvement on economic measure, efficiency measure, effectiveness measure, and overall performance. Continuous improvement was found to be a statistically determinant of effective measure, efficiency measure, and overall performance of the organization. However, it was not found to be a statistically significant determinant of economic measure of performance. Combined with other factors, their combined effect on economic measure was significant.

5.2 Conclusion

The objectives of the study were to explore the degree of effectiveness of TQM practices in organizational performance. The main hypothesis of the study was that TQM has no positive effect organizational performance. The findings show that although some measures of organizational performance could be significantly impacted by TQM practices, all elements of TQM do not directly contribute to enhanced performance of the organization.

TQM practices that seem to play a major role in enhancing performance are integrated systems and continuous improvement and to a lesser extent, strategic and systematic approach. Top management commitment does not appear to contribute to higher performance but the soft TMC is important for the performance. TMC acts as the main driver for TQM implementation, creating values, goals and systems to achieve organizational performance. Overall, the findings clearly show that TQM elements significantly improve the organizational performance.

The results of this study indicated that total quality management (TQM) positively influences organizational performance. While some of the components of TQM were not found to significantly influence performance, the combined overall effects of Top Management Commitment, Strategic and Systematic Approach, Integrated systems, and Continuous Improvement which are the components of TQM were found to be significant. Based on the results, it is more beneficial to implement the components of TQM jointly as opposed to individually. For instance, top management commitment was not found to individually significantly affect performance or the measures of performance. However, when implemented with other TQM components, it contributed positively to organizational performance. Implementing any component of TQM in isolation would deny the organization the synergetic effects that come with implementing them jointly.

5.3 Recommendations

This study recommends a further study to establish the reason why there were no significance on top management commitment and strategic and systematic approaches since they positively contributed to the overall performance.

The management of the organization should consider fully empowering and training the employees to motivate them to continue performing to achieve the goals of the organization. Team building amongst staff is another important area that the top management could focus on as it enables staff interaction across the board thus eliminates segregation.

5.4 Limitations of the Study

The study used subjective measures of performance which may not give accurate information to test the hypotheses. Furthermore, the study asked for perceived data about actual TQM practices and performance measures, but the respondents might have given desired data, which made the organization appear perfect. It is necessary to evaluate this study in the context of its limitations. The information gathered was absolutely the respondent's perception of the degree at which they felt that the organization practices total quality management.

5.5 Suggestions for further study

Although the study was carefully carried out, there were some limitations that were experienced. In an exploratory study based on these findings, future research may start from a relatively higher level of knowledge including observation and one-on-one interview. First, a replication of this study would be helpful in re-examining the validity of its findings. Further empirical studies using larger sample sizes, greater geographical diversity, and different international research organizations but of similar nature would be helpful in validating the TQM elements used in this study. Subsequent research needs to be engaged in the development of more valid and reliable operational definitions for the proposed constructs, overcoming the limitations posed by the data source used in this study. Further study could also be considered in same area but using different methodology; same methodology but is different context, different constructs but with the same concepts.

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APPENDICES

Appendix I: Introduction Letter

To Whom It May Concern:

Dear Sir/Madam,

RE: COLLECTION OF DATA

I am a Masters student in the School of Business and Economics at the Maseno University. As part of the requirement for the award of the Master of Business Administration (Strategic Management), I am undertaking a research study titled **"EFFECT OF TOTAL QUALITY MANAGEMENT ON ORGANISATIONAL PERFORMANCE IN INTERNATIONAL RESEARCH ORGANISATION IN KENYA".**

I am therefore seeking your assistance to fill the attached questionnaire. This will take about 10 minutes to complete. The research results will be used for academic purposes only and will be treated with utmost confidentiality.

Yours sincerely,

Susan A. Akelo
MBA/BE/06016/2015

Instructions

Kindly answer all the questions in all the sections of the questionnaire.

Appendix II: Questionnaire

TOTAL QUALITY MANAGEMENT IN INTERNATONAL RESEARCH ORGANISATION

Please take a few minutes to complete this questionnaire. This research is being undertaken purely for academic purposes. Your honest answers will be treated with the highest level of confidentiality and your views will be highly appreciated. Kindly answer all questions.

PART I: GENERAL INFORMATION

Please tick (√) as appropriate

Location …….. **Theme/Unit** ……

1. Age

21-30 years ( )

31-40 years ( )

41-50 years ( )

Above 50 years. ( )

2. Gender Male ( ) Female ( )

3. Level of education

PhD ( ) Masters ( ) Bachelors ( ) Diploma ( ) Certificate ( )

Others (specify)……..

4. **Your current job title:** …….

5. How many years have you served at *icipe*?

Less than 2 years ( )

3-5 years ( )

6-10 years ( )

More than 10 years ( )

PART II: TOTAL QUALITY MANAGEMENT PRACTICES

In a scale of 1-5, please indicate the extent to which you agree that the mentioned total quality management practices are applicable to your organization (super short scale)

No.	**TQM Practices**	Strongly disagree 1	Disagree 2	Moderately 3	Agree 4	Strongly Agree 5
1.	**Top management commitment**					
	Our organization drives a culture of quality.					
	Our organization embraces effective communication.					
	Our employees are empowered on their jobs					
2.	**Strategic and Systematic Approach**					
	Our employees are aware of mission and vision of the organization					
	We develop strategic plans for the organization					
	Our organization has put in place working procedures					
3.	**Integrated Systems**					
	Our organization fosters an environment where diverse individuals can work together effectively.					
	Employees understand the inter-unit relationship.					

	Systems integration is continuously improved.					
	Continuous Improvement					
	Our organization undertakes regular audits					
	Our employees are highly committed to quality improvement					
	Our organization is keen about creativity and innovativeness.					

PART III: ORGANIZATIONAL PERFORMANCE

In a scale of 1-5, please indicate the extent to which you agree with these statements on the state of your organizational performance.

No.	**Organisational performance**	Strongly disagree 1	Disagree 2	Moderately 3	Agree 4	Strongly Agree 5
	Economy					
	Our organization optimally uses available resources					
	Our organization collaborates with various partners to access resources not available internally					
	Our organization's governance structure provides prudential oversight over the resources					

	Efficiency					
	The organizational resources are applied for intended purposes only					
	Our employees are efficient in their operations					
	We develop our people for optimal performance					
	Effectiveness					
	We continually achieve our broad organizational objectives					
	Our objectives meet and exceed expectations of our stakeholders					
	We have a clear focus on both medium and long-term perspective of the organization					

a) Is there any challenge(s) you experience during implementation of quality standards?

Please describe _____

_____

b) Please suggest any idea you may have that will help in improving the overall quality

systems _____

_____

THANK YOU!

Appendix III: Likert-Scale Distribution Responses

Table 3.2 Distribution of responses on Likert scale for total quality management practices and organization performance measures

Practices	Strongly Disagree	Disagree	Moderately	Agree	Strongly Agree
Drives a culture of quality	2	1	14	34	20
Embraces effective communication	5	5	10	31	20
Employees are empowered	6	3	30	31	1
Employees are aware of mission and vision	0	3	11	33	24
We develop strategic plans for the organization	1	7	16	34	13
Organization has put in place working procedures	0	3	12	31	25
Fosters an environment where diverse individuals can work together effectively	0	2	10	31	28
Employees understand the inter-unit relationship	2	2	19	38	10
Systems integration is continuously improved	1	7	19	34	9
Undertakes regular audits	0	3	13	32	22
Employees are highly committed to quality improvement	1	1	18	34	16
Organization is keen about creativity and innovativeness	2	0	15	40	14
Organization optimally uses available resources	1	1	12	43	14
Organization collaborates with various partners to access resources not available internally	0	0	5	34	32
Organization governance structure provides prudential oversight over the resources	2	1	16	38	14
Organizational resources are applied for intended purposes only	0	1	18	38	14
Employees are efficient in their operation	0	2	10	47	12
Organization develop people for optimal performance	2	3	22	34	10
Continually achieve our broad organizational objectives	0	1	12	42	16
Our objectives meet and exceed expectations of our stakeholders	0	2	21	35	13
We have a clear focus on both medium and long-term perspectives of organization	1	3	8	41	17

Appendix IV: Research Plan

Tasks	This will be completed in 15 weeks w.e.f. April 2017														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Research Proposal Writing															
Instrument construction															
Proposal approval															
Data collection															
Data coding															
Data analysis & interpretation															
1st report writing															
2nd report writing															
Final report writing & submission															

Appendix V: Research Budget

Item	Unit	Quantity	Unit price	Estimated cost
Statistician/Data processing	Month	1	15,000.00	15,000.00
Transport and subsistence	Day	90	300.00	27,000.00
Supplies and stationery:				
-Note books	Piece	6	100.00	6,000.00
-Document holders	Piece	6	100.00	6,000.00
-Photocopying papers	Ream	1	500.00	500.00
-Bic pens	Piece	6	100.00	60.00
-Pencils	Piece	6	10.00	60.00
-Flash discs	Piece	2	2,500.00	5,000.00
Communication: -Airtime	Month	3	1,000.00	3,000.00
Other services: Printing & Photocopying & Binding	Piece	6	2,000.00	8,000.00
Total KES.				**70,620.00**