UNIVERSITY OF GHANA

TOTAL QUALITY MANAGEMENT PRACTICES AMONG MANUFACTURING FIRMS IN GHANA

BY

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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL OPERATIONS MANAGEMENT DEGREE.

JULY, 2013

DECLARATION

I do hereby declare that this thesis is as a result of my own work produced from research undertaken under supervision and has not been presented by anyone for any academic award in this or any university. All references used in the work have been fully acknowledged.

I bear sole responsibility for any shortcomings.

…… …….

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CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

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DR. KWAKU OHENE-ASARE DATE

(CO-SUPERVISOR)

DEDICATION

I dedicate this work to God almighty for bringing me this far. I also dedicate it to my entire family and to all my loved ones.

ACKNOWLEDGEMENT

I give thanks to God for the gift of life and the grace to live each day with better outlook in life.

I am indebted to my supervisor, Dr. Francis Y. Banuro for his timeless dedication during the supervision of this work.

My heart goes out to my Dad, Mr. Kingsley Anthony Edu, my Mother, Mrs. Christiana Edu and all my siblings (Dorcas, Esther, Joseph, Isaac and Robert) for their encouragement and challenge to do more.

I express my appreciation to very special persons in my life: Maame Ekua Gaisey, Selorm Devine Agozie (my only course mate), Lenin Ann Kamanya, Dr. Richard Boateng and Mr. Samuel Nana Yaw Simpson for being there and believing in me.

My sincere thanks also go to all the manufacturing firms' especially to Accra Brewery Limited and Voltic Ghana Limited for providing so much information that has enabled me complete my thesis.

To all who have not been mentioned here but have contributed in varied ways to the completion of my course, I say, THANKS LOTS.

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LIST OF ABBREVIATIONS

AGOA	African Growth and Opportunity Act
AGI	Association of Ghanaian Industries
CF	Customer Focus
EFQA	European Foundation for Quality Awards
ET	Education and Training
EP	Employee Participation
GC 100	Ghana Club 100
GIPC	Ghana Investment Promotion Council
GSP	Generalized System of Preference
ISO 9000	International Organization for Standardization
LCL	Lower Control Limit
MBNQA	Malcolm Baldrige National Quality Awards
PC	Process Control
PDCA	Plan-Do-Check-Act
QMS	Quality Management Systems
RR	Reward and Recognition
SQM	Supplier-Producer Quality Management
TMC	Top Management Commitment
TQM	Total Quality Management
UCL	Upper Control Limit

ABSTRACT

The "total quality" concept is a general philosophy of management which includes all key requirements that contribute not only to customer-perceived quality, but also to customer satisfaction. The International organization for standardization defined Total Quality Management (TQM) as coordinated activities aimed at the control and direction of the organization towards quality. This has driven most organizations to provide products or services which consistently meet or exceed customers' expectations and on time with quality as the basis of efficacy. Although TQM is a proven approach for success in manufacturing, services and the public sector, several organizations failed in their campaigns because of many reasons like lack of top management commitment, ignoring customers and so on. It is therefore necessary for implementers of TQM to understand what the reliable and valid critical success factors of TQM are, and how these factors influence operational and business performances and excellence. However, in Ghana, very little is known on how TQM and ISO 9000 influence employee satisfaction, quality of product and customer satisfaction. This therefore requires Ghanaian manufacturing companies to comply with International Organization for Standards (ISO) 9000 in meeting customers' continuous demands for quality products. This study was conducted to determine the extent to which ISO 9000 certification and TQM is practiced among manufacturing firms in Ghana. The study adopted positivist approach whereby the researcher explored and empirically tested the factors that influences TQM and ISO 9000 implementation using quantitative techniques. Friedman rank test for multiple comparisons and Chi-square Test were used to ascertain whether the various factors have different impact on TQM implementation. The results from this study indicate that factors such as top management commitment, education and training, supplier-producer quality management, employee

participation, process control and improvement, customer focus and reward and recognition contribute significantly to the successful implementation of TQM. Overall, TQM practice in Ghana is very low especially among indigenous Ghanaian manufacturing firms and cannot be described as a total approach. Regarding the extent of application of quality management, differences were observed between multinational firms with some level of expatriate management and indigenous Ghanaian firms owned and solely managed by Ghanaians with the former performing better. The differences were attributed to the level of top management commitment, employee participation, education and training, reward and recognition, supplier-producer quality management, process control and improvement and customer focus.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Since the 1980s firms around the world have launched Total Quality Management (TQM) programs in an attempt to retain or regain competitiveness in order to achieve customer satisfaction in the face of increasing competition from around the world in this era of globalization. The "total quality" concept is a general philosophy of management which includes all key requirements that contribute not only to customer-perceived quality, but also to customer satisfaction (Seyed-Mahmoud, 2002). The drive by organizations to provide products or services which consistently meet or exceed customers' expectations and on time must rely on quality as the basis of efficacy (Zairi, 2002). Quality is the ability of a product or service to meet or exceed customer expectations (Stevenson, 2011).

Over the past few decades, quality gurus such as Walter Shewhart, W. Edwards Deming, Joseph M. Juran, Philip Crosby, Armand V. Feigenbaum and Kaoru Ishikawa, have developed certain propositions in the field of TQM, which have gained significant acceptance throughout the world (Zhang, 2000). Their insights provided a good understanding of the TQM philosophy, principles, and practices. After a careful study of their work, it has been found that these quality gurus have different views about TQM, although some similarities can be found. Worldwide, there are several quality awards such as the Deming Prize in Japan, the European Quality Award in Europe, and the Malcolm Baldrige National Quality Award in the United States of America. Each award model is based on a perceived model of TQM. However, the three award models are different from each other and each has its own characteristics. In the field of TQM implementation, much research has already been conducted, different researchers adopting

different definitions of TQM. "The concept is still a subject of debate, still a hazy and ambiguous concept" (Zhang, 2000). The recent emergence of total quality management in the U.S. has spawned a great deal of interest in management circles as well as in the mass media. However, despite the growing number of firms that have adopted this management technique, few formal tests exist concerning the pattern of adoption as well as the changes that accompany the adoption of TQM. The awareness of quality management among the Small and Medium Scale Enterprises is on the increase due to its positive effect on organizations and Ghana is no exception to this increasing phenomenon. Many firms have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace (Karani and Bichanga, 2012). TQM achievement has become an important measure in organizational success in both manufacturing and services (Nofal et al.2005). Krajewski et al., (2007) established that quality is one important strategic weapon that enhances global competition in most organizations. Total quality management also allows firms to obtain a high degree of differentiation and to reduce costs (Tari, 2005). However, Evans and Lindsay (2001) assert that companies that resist TQM may not be in business for long. Achieving total quality management for quality products or services is the responsibility for everyone involved with the creation or consumption of these products and services offered by organizations. Zairi (2002) observed that quality is no longer the responsibility of a separate quality assurance department, but the responsibility of every employee, and that the commitment of employees to the goal of quality is fundamentally important to the sustainability of total quality management. This is because quality management is focused not only on product or service quality but also the process to achieving it. High product quality and pursuing successful TQM implementation are highly dependent on top management support. Salaheldin (2003) found that top management

commitment to quality is the most important driving force that prompts TQM implementation in Egypt.

1.2 Problem statement

Understanding thoroughly the principles underpinning such an important concept as TQM is vital. Companies are already failing with their TQM programmes because they have adopted them too hastily, without examining the fundamental changes in corporate attitudes necessary for success (Narasimhan, 2011). This has accounted for the failure of most organizations in meeting up to their expected target from implementing this ideology (Ugboro and Obeng, 2000). TQM has the power to bring positive change and progression- but only if you know how.

In a global market, companies survive only if they consistently manufacture products that meet and exceed their customer's needs (Kotler, 2003). Customers demand continuously improved products at lower prices. To produce better products at lower prices, manufacturers must continuously improve their production processes. Notwithstanding the popularity of the concept of TQM, its adoption and implementation seem to be limited to firms of developed countries such as USA, UK, Japan and other European countries, with little emphasis if any, on firms in developing countries (Mellahi and Eyuboglu, 2001). This requires Ghanaian organizations or manufacturing companies to comply with International Organization for Standards (ISO) 9000 in meeting customers' continuous demands for quality products. The recent discovery and production of oil in commercial quantities have added to the attraction of the country as an investment destination. This therefore provides an opportunity for firms in Ghana to take advantage of the lowering of barriers and signing of trade agreements that offer open access to international markets to ensure that the standards of their products meet the strict quality

standards of these markets. The introduction of the African Growth and Opportunity Act (AGOA) presents huge opportunities for membership countries. The programme seeks to provide African countries, including Ghana, with the opportunity of exporting to the USA without any (or with little) duty and quota paid by exporting African countries for certain industries such as textile and agriculture. On the regional scene, Ghana is a member of the Economic Community of West African States (ECOWAS) and she also benefits from the preferential treatment given to members of the African, Caribbean and Pacific States (ACP) by European Union on the international markets. Also, Ghana meets the requirements of the Generalized System of Preferences (GSP), which offers preferential access not only to the EU but also to many other rich markets, e.g. Japan (Millennium Cities Initiatives, 2008). However in Ghana, very little is known on how TQM and ISO 9000 influence quality of product. Also, very little research has been done to assess the influence of TQM and ISO 9000 on firm productivity and quality of products. Often than not, some firms in the country have been heavily criticized for not meeting quality standards in their quest to satisfy consumers. Both the manufacturing and the service companies encounter these criticisms. Also, in a time where there have been massive attempts by authorities of Ghana to curb the proliferation of fake and non-standardized products into the Ghanaian market, the need for quality assurance from both the local and international perspective cannot be over-emphasized. As a result, in 2008, the then Ministry of Trade, Industry, Private Sector Development and President's Special Initiatives pledged its continuous support to facilitate the installation of Quality Management Systems (QMS) by Micro, Small and Medium Enterprises (SMEs) to ensure quality standards in their business, (Ghana New Agency, October 15 2008). Menash et al, (2012), revealed that awareness of quality management is relatively high among the Ghanaian multinational firms that have some degree of expatriate management and

they performed fairly well. However, they still trail their international counterparts with similar top management commitment and resource base. On the other hand, the study revealed that with the exception of long-established and well-resourced government enterprises, a low degree of quality awareness and poor performance exist among firms owned and managed solely by Ghanaians. The finding is that quality management practiced by Ghanaian firms (both multinationals and indigenous) is not a total approach and hence the conclusion is that total quality management, by implication, is not yet being practiced in Ghana (Mensah et. al, 2012). It is against this backdrop that developing countries such as Ghana should endeavour to incessantly make unflinching efforts to producing and providing goods and services that meet international standards such as that in ISO 9000.

1.3 Objective of study

The purposes of this study are:

i. To evaluate quality systems, policies, procedures and activities within manufacturing firms in Ghana.
ii. To investigate the extent to which the important critical factors of TQM implementation are adopted by manufacturing firms in Ghana.
iii. To investigate whether a manufacturing firm's characteristics affect the appreciation of the theory and implementation of TQM.
iv. To develop a TQM implementation model for Ghanaian manufacturing firms.

1.4 Research hypothesis

This study is designed to investigate the reasons for the low level of awareness and practical implementation of TQM among Ghanaian manufacturing firms. The research hypothesis sought to explain the existence of the following issues.

i. A manufacturing firm's characteristics influence the level of awareness and practical implementation of TQM.
ii. Manufacturing firms in Ghana can achieve competitive advantage by embarking on TQM implementation.
iii. Ghanaian manufacturing firms can achieve higher customer allegiance when they implement TQM.
iv. Critical factors affect the implementation of TQM differently.

1.5 Literature Review

Relevant and recent literature was reviewed on the theories of quality management and its implementation. Contributions by the quality gurus were discussed in this study. The literature review further included Quality control tools and technique, International Standardization for Organization (ISO) 9000 standards, and Quality Management systems.

Other relevant literature on TQM implementation on business performance and the conceptual framework for the study was thoroughly discussed and developed respectively.

1.6 Methodology

The methodology employed for this thesis used the positivist approach, survey method and quantitative techniques.

Population

The population of the study was primarily the manufacturing firms in Ghana. These firms include both multinational and local manufacturing firms in the country. The multinational firms are believed to be more exposed to TQM concepts than the local firms and hence a study of the two categories provided adequate information. In all, a sample size of 60 firms were used for this study. These firms include 30 firms implementing TQM. The composition was 10 multinational and 20 indigenous manufacturing firms in Ghana. The remaining 30 firms were local manufacturing firms that have not adopted or have low degree of awareness of TQM. Indeed the firms selected for the study are producing products that require high quality since they are consumables. This buttresses the importance of this study.

Sampling Procedure

A probability sampling technique was adopted for the study. That is, a simple random sampling technique was used to select the firms from their respective categories for this study. The selection was based on manufacturing firms in the area of consumable products, chemicals, plastics, electronics and household appliances. We choose to use these firms because their products require high quality levels.

Source of Data

Data was collected from primary sources. Data from primary sources include interviews supported by questionnaires from key informants and experts within and outside the companies under study.

Data Analysis

The data collected was analyzed using SPSS (19) and presented in the form of tables, charts, graphs and percentages. The same software was employed to conduct hypothesis tests.

1.7. Significance of the study

An effective TQM implementation and adoption can improve competitive abilities and provide strategic advantages in the marketplace for firms. The study will be a source of reference to government and policy makers that will redirect the attention on the need to assist manufacturing firms in the practice of quality management to provide quality goods to capture loyal customers. Again, it will give a policy direction to the Ghana Standard Board, the Consumer Protection Agency and foreign agencies like ISO and others that are committed to seeing the development, growth and the successful implementation of TQM in Ghana.

The study will also provide insight to industries in Ghana, more especially to manufacturing firms both private and state-owned, to employ the TQM in the process of product design and manufacturing. Also to business advisors, this study will open avenues for opportunities in business consulting. Small firms that are willing to implement TQM practices will need the services of business advisors or management consultants for quality management implementation. Above all, the study will contribute to existing literature by presenting evidence from the outcome of this thesis.

1.8. Limitation and scope of study

This study is necessarily limited in scope due to a series of resource limitations as well as practical research limitations. The series of resource and practical limitations that constrain this research project are listed below with possible mitigation strategies developed for them.

i. This thesis was limited to manufacturing firms in Accra and Tema metropolis in the Greater Accra region of Ghana. These two cities hold about 55% of the manufacturing industries in Ghana. Accra is the national capital and the most popular city with many of the firms in manufacturing. Tema is also the most industrialized city in the country. For these reasons, these two cities are chosen for the study.

ii. A major constraint is financial obligation required for this study. This involves cost of frequent visits to the selected firms for the data collection as well as cost of obtaining vital information needed for the successful completion of this work. The effect of this constraint was minimized through the use of telephone calls and e-mails to the personnel in the various firms chosen for the study.

iii. This study is also constrained by the time frame in which this thesis is to be completed. Due to the academic requirements, this study is limited to one academic year. A time plan was developed for each stage of the thesis to comply with the academic calendar.

iv. Lastly, co-operation from firms or respondents to provide information about their firms is yet another limitation to the study. The researcher provided assurance to the firms or respondents that any information provided will be used for academic work in order to get all available information for the study.

1.9 Organization of the study

Chapter One includes the background of the study, problem statement, the objectives of the study, the research questions, the significance of the study and limitations and scope. Chapter Two critically identifies and explores the literature review on TQM.

Chapter Three further looks at the methodology of the study. It explains the population, the sampling technique, data collection technique and how the data is analyzed. Chapter Four presents the data and their analysis which are exhibited in tables, charts, graphs and percentages.

In Chapter Five, discussion of the results is presented. The TQM model is presented in Chapter Six. Chapter Seven contains the summary, recommendations and conclusions of the thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The essence of this literature review is to get understanding of the impact of TQM on business excellence of firms and potential reasons for TQM failures. In addition to getting a complete understanding of the theory and practice of TQM, various studies were analyzed and reviewed. This chapter is organized into ten (10) parts which include Section 2.2 which reviews the evolution of TQM. Section 2.3 reviews the concepts and theories of TQM while Section 2.4 explains Quality control tools and techniques. In addition, Section 2.5 explains quality management system. The concept and content of ISO 9000 are explained in Section 2.6. Sections 2.7 and 2.8 further review the quality awards model and TQM implementation among business respectively. The relationship between TQM and organization performance are explained in Section 2.9 while Section 2.10 examined the critical factors of TQM implementation. Section 2.11 concludes on the Conceptual Framework for this thesis.

2.2 Evolution of Total Quality Management

TQM is a process that has been thoroughly researched by many quality gurus. Each expert has devised his or her own action plan for success. The companies of today have begun implementing the concepts established by the quality gurus. Seyed-Mahmoud (2003) found that, the TQM concept has given companies the opportunity to provide quality goods and services to capture loyal customers. This study reviewed the contributions to TQM by these quality gurus (Walter Shewhart, Edward W. Deming, Joseph M. Juran, Armand V. Feigenbaum, Philip B. Crosby and Karou Ishikawa) in the next subsection.

2.2.1. Walter Shewhart

Walter Shewhart was a statistician who worked at Bell Laboratories during the 1920s and 1930s (Russel and Taylor, 2012). Shewhart studied randomness and recognized that variability existed in all manufacturing processes. He contributed to the development of technical tools such as control charts that formed the basis of statistical quality control that are used to identify whether the variability in the process is random or due to an assignable cause, such as poor workers or mis-calibrated machinery. He stressed that eliminating variability improves quality. He and his colleagues at Bell Laboratories further introduced the term *quality assurance* for their program to improve quality through the use of statistical control methods. His work created the foundation for today's statistical process control, and he is often referred to as the "grandfather of quality control."

2.2.2. W. Edward Deming

In the 1940s Deming worked at the Census Bureau, where he introduced the use of statistical process control to monitor the mammoth operation of key punching data from census questionnaires on to millions of punch cards. During World War II, Deming developed a national program of 8 and 10 day courses to teach statistical quality-control techniques to over 10,000 engineers at companies that were suppliers to the military during the war. By the end of World War II he had an international reputation. In 1950 Deming began teaching statistical quality control to Japanese companies. As a consultant to Japanese industries and as a teacher, he was able to convince them of the benefits of statistical quality control. He is a major figure in the Japanese quality movement, and in Japan he is frequently referred to as the father of quality control. Deming's approach to quality management advocated continuous improvement of the

production process to achieve conformance to specifications and reduce variability. He identified two primary sources of process improvement, thus, eliminating common causes of quality problems, such as poor product design and insufficient employee training, and eliminating special causes, such as specific equipment or an operator. Deming emphasized the use of statistical quality control techniques to reduce variability in the production process (Stevenson, 2011). He dismissed the then widely used approach of final product inspection as a means of ensuring good quality as coming too late to reduce product defects. He also advocates that the primary responsibility for quality improvement is that of the employees and management and not only technicians.

He promoted extensive employee involvement in a quality improvement program, and he recommended training for workers in quality-control techniques and methods. Deming's overall philosophy for achieving improvement is embodied in his 14 points, summarized in Table 2.1 below.

Table 2.1: Deming's 14 Points for Quality Management and Improvement

1. Create a constancy of purpose toward product improvement to achieve long-term organizational goals.
2. Adopt a philosophy of preventing poor-quality products instead of acceptable levels of poor quality as necessary to compete internationally.
3. Eliminate the need for inspection to achieve quality by relying instead on statistical quality control to improve product and process design.
4. Select a few suppliers or vendors based on quality commitment rather than competitive prices.
5. Constantly improve the production process by focusing on the two primary sources of quality problems, the system and employees, thus increasing productivity and reducing costs.
6. Institute worker training that focuses on the prevention of quality problems and the use of statistical quality-control techniques.
7. Instill leadership among supervisors to help employees perform better.
8. Encourage employee involvement by eliminating the fear of reprisal for asking questions or identifying quality problems.
9. Eliminate barriers between departments, and promote cooperation and a team approach for working together.
10. Eliminate slogans and numerical targets that urge employees to achieve higher performance levels without first showing them how to do it.
11. Eliminate numerical quotas that employees attempt to meet at any cost without regard for quality.
12. Enhance worker pride, artisanry, and self-esteem by improving supervision and the production process so that employees can perform to their capabilities.
13. Institute vigorous education and training programs in methods of quality improvement throughout the organization, from top management down, so that continuous improvement can occur.
14. Develop a commitment from top management to implement the previous 13 points.

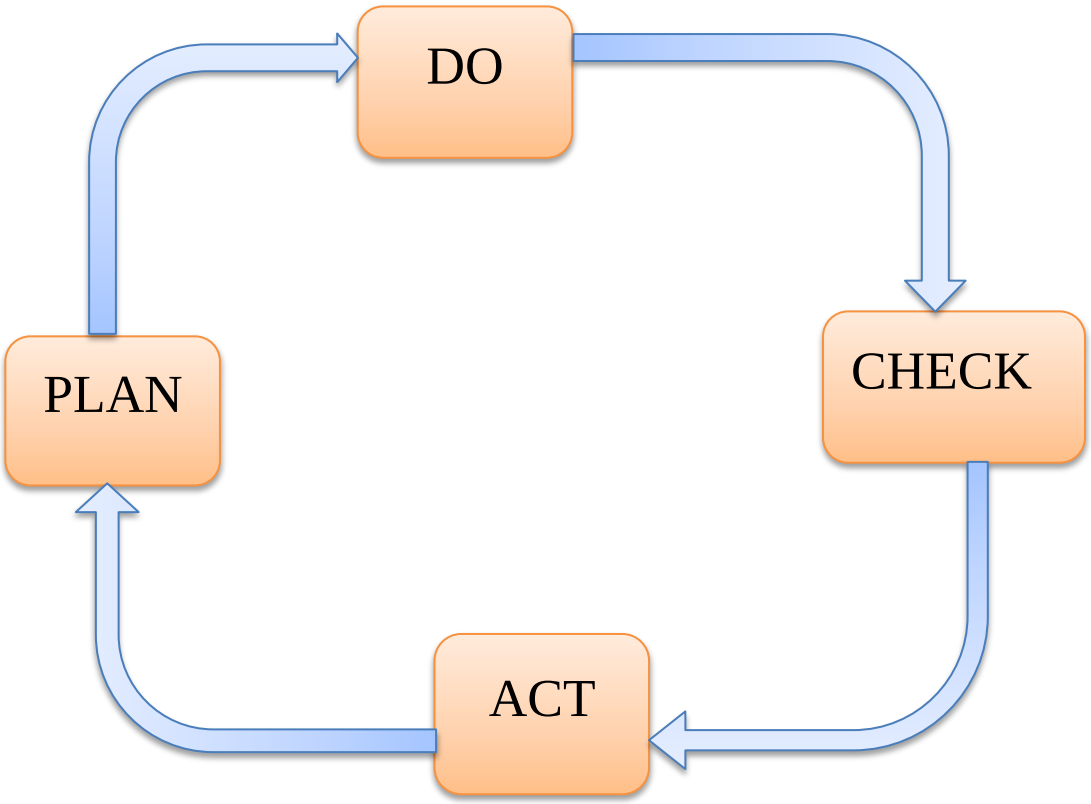
Source: Russell and Taylor, 2011 page 61.

Deming is also credited for the development of the *Deming's Wheel*, or *plan-do-check-act (PDCA) cycle*, although it was originally formulated by Walter Shewhart and renamed by the Japanese.

The Deming's Wheel is a four-stage process for continuous quality improvement that complements Deming's 14 points. The four-stage process is used to identify current problems that exist in a production process or used to identify opportunities to enhance and implement a plan that is identified to be working effectively. The first stage of the process is the planning

stage. This stage studies a current process to identify whether there are problems within the system and a plan is developed to improve the system. Stage two which is the "DO" stage, implements the plan on a test or trial basis and then a measurement is performed to check improvement. For a manufacturing industry, this stage will be defined as the design of the products which must meet customer requirements. During the implementation process, managers must document all changes made and collect data for evaluation. The third stage then studies or assesses the plan implemented to check whether the plan is working and whether the ultimate goal is being achieved. Thus, the data are evaluated to see whether the plan is achieving the goals established at the plan phase. The final stage of the cycle institutionalizes the improvement and continues the cycle. The best way to accomplish this is to communicate the results to other members in the company and then implement the new procedure if it has been successful. All these stages are repeated over again in the cycle. Figure 2.1 explains the Deming's Wheel. Deming's approach to quality embodied in his 14 points and PDCA cycle are the foundation for today's quality management systems employed by many successful companies.

Figure 2.1 Deming's Wheel (PDCA Cycle)



Source: Russell and Taylor, 2011 page 61

2.2.3. Joseph M. Juran

After W. Edwards Deming, Dr. Joseph Juran is considered to have had the greatest impact on quality management. Juran originally worked in the quality program at Western Electric. He became better known in 1951, after the publication of his book *Quality Control Handbook.* In 1954 he went to Japan to work with manufacturers and taught classes on quality. Though his philosophy is similar to Deming's, there are some differences. Whereas Deming stressed the need for an organizational "transformation," Juran believes that implementing quality initiatives should not require such a dramatic change and that quality management should be embedded in the organization. One of Juran's significant contributions is his focus on the definition of quality

and the cost of quality. Juran is credited with defining quality as fitness for use rather than simply conformance to specifications. The fitness for use takes into account customer intentions for use of the product, instead of only focusing on technical specifications. Juran is also credited with developing the concept of cost of quality, which measures quality in monetary terms rather than on the basis of subjective evaluations. Juran is well known for originating the idea of the quality trilogy thus, quality planning, quality control, and quality improvement. The first part of the trilogy, *quality planning*, is necessary so that companies identify their customers, product requirements, and overriding business goals. Processes should be set up to ensure that the quality standards can be met. The second part of the trilogy, *quality control*, stresses the regular use of statistical control methods to ensure that quality standards are met and to identify variations from the standards. The third part of the quality trilogy is *quality improvement*. According to Juran, quality improvements should be continuous as well as breakthrough. Together with Deming, Juran stressed that to implement continuous improvement workers need to have training in proper methods on a regular basis. Pareto charts is one of the statistical control tools attributed to Joseph M. Juran.

2.2.4. Armand V. Feigenbaum

Another quality leader is Armand V. Feigenbaum who introduced the concept of total quality control. In his 1961 book "*Total Quality Control",* he outlined his quality principles in 40 steps. Feigenbaum took a total system approach to quality. He promoted the idea of a work environment where quality developments are integrated throughout the entire organization, where management and employees have a total commitment to improve quality, and people learn

from each other's successes. This philosophy was adapted by the Japanese and termed "company-wide quality control."

2.2.5 Philip B. Crosby

Philip B. Crosby is another recognized guru in the area of TQM. He worked in the area of quality for many years, first at Martin Marietta Inc, (a leading producer of construction aggregates in the U.S., supplying granite, sandstone, limestone, sand and gravel to build roads, sidewalk and foundations) and then, in the 1970s, as the vice president for quality at ITT corporation. He developed the phrase "Do it right the first time" and the notion of *zero defects*, arguing that no amount of defects should be considered acceptable. He scorned the idea that a small number of defects is a normal part of the operating process because systems and workers are imperfect. Instead, he stressed the idea of prevention. To promote his concepts, Crosby wrote a book titled *Quality Is Free*, which was published in 1979. He became famous for coining the phrase "quality is free" and for pointing out the many costs of quality, which include not only the costs of wasted labor, equipment time, scrap, rework, and lost sales, but also organizational costs that are hard to quantify. Crosby stressed that efforts to improve poor quality pay for themselves because these costs are prevented. Therefore, quality is free. Like Deming and Juran, Crosby stressed the role of management in the quality improvement effort and the use of statistical control tools in measuring and monitoring quality.

2.2.6. Karou Ishikawa

Karou Ishikawa is best known for the development of the quality tool called cause-and-effect diagram, also called fishbone or Ishikawa diagram. This diagram is used for quality problem solving. He was the first quality guru to emphasize the importance of the "internal customer," the next person in the production process. He was also one of the first to stress the importance of total company quality control, rather than just focusing on products and services. Ishikawa believed that everyone in the company needed to be united with a shared vision and a common goal. He stressed that quality initiatives should be pursued at every level of the organization and that all employees should be involved. Ishikawa was a proponent of the implementation of *quality circles*, which are small teams of employees that volunteer to solve quality problems.

The reviews of the approaches to TQM by these quality gurus have revealed that each has his own distinctive approach. Nevertheless, the principles and practices of TQM proposed by these quality gurus do provide a better understanding of the concept of TQM. Their insights offer a solid foundation for conducting this study. Although their approaches to TQM are not totally the same, they do share some common points which are summarized as follows:

1. It is management's responsibility to provide commitment, leadership, empowerment, encouragement, and the appropriate support to the technical and human processes. It is top management's responsibility to determine the environment and framework of operations within a firm. It is imperative that management foster the participation of the employees in quality improvement, and develop a quality culture by changing perception and attitudes toward quality.
2. The strategy, policy, and firm-wide evaluation activities are emphasized.

3. The importance of employee education and training is emphasized in changing employees' beliefs, behavior, and attitudes; enhancing employees' abilities in carrying out their duties.
4. Employees should be recognized and rewarded for their quality improvement efforts.
5. It is very important to control the processes and improve quality system and product design. The emphasis is on prevention of product defects, not inspection after the event.
6. Quality is a systematic firm-wide activity from suppliers to customers. All functional activities, such as marketing, design, engineering, purchasing, manufacturing, inspection, shipping, accounting, installation and service, should be involved in quality improvement efforts.

These ideas have exerted an influence upon later studies, in such a way that the literature on TQM has progressively developed from these initial contributions, identifying various elements for effective quality management. Claver et.al (2003) also stressed that, although several literatures vary from one another, there is a common core of TQM critical factors. These factors include: customer focus, leadership, quality planning, management based on facts, continuous improvement, human resource management, involvement of all members, training, work teams and communication systems, learning, process management, cooperation with suppliers and organizational awareness and concern for the social and environmental context.

2.3 Concept and Theories of Total Quality Management

There are several interpretations of the TQM but with few clear definitions (Hansson, 2003). Dale et al. (2001) described TQM as an umbrella of concepts and ideas in various contexts related to the quality field. TQM is also described as the mutual cooperation of everyone in an organization and associated business processes, in order to produce products and services which

meet, and hopefully exceed the needs and expectation of customers (Hansson 2003). Sila and Ebrahimpour (2002), found in their extensive theoretical investigation that customer focus and satisfaction, employee training, leadership and top management commitment, teamwork, employee involvement, continuous improvement and innovation, quality information and performance measurement were the factors most frequently addressed within TQM definitions. The International Organization for Standardization further defined TQM as coordinated activities aimed at the control and direction of the organization towards quality. In exploring the literature, the following factors were detected as those that constitute TQM: leadership, strategic quality planning, employee management and involvement, supplier management, customer focus, process management, continuous improvement, information and analysis, knowledge and education, and quality management tools and techniques (Rahman and Siddiqui, 2006; Drew and Healy, 2006; Ahmed et al., 2005; Lagrosen and Lagrosen, 2005; Tari, 2005). Further literature reviewed also emphasized that, these results, which include customer satisfaction, employee satisfaction, the protection of natural and social environment and finally the internal and external business were successfully achieved through the implementation of the TQM practices (Ju et al., 2006; Karia and Asaari, 2006; Seth and Tripathi, 2006; Singh and Smith, 2006; Yang, 2006).

Despite the divergence of views on what constitutes TQM, there are a number of common elements running through the various definitions. It is also clear from the various definitions that there is no unique definition of the TQM but the dominant issues are customer satisfaction and continuous improvement in all definitions of TQM. From a cursory review of the award-based and academic-based frameworks, Sharma and Kodali (2008) found that there are some elements or factors which are common across various frameworks, while many elements or factors differ considerably. The key concept in the practices and implementation of TQM is ensuring that all

activities of the organization are coordinated together to satisfy the customer. TQM is therefore, a management approach that encourages everyone in the organization to focus exclusively upon serving the customer (Feigenbaum, 2001). Although, TQM is a well-established field of study for business excellence, the success rate of TQM implementation is not very high. The major reason for TQM failure is the tendency to look at TQM as a tool and not as a system (Mallur et al., 2012). Mullar et al., (2012) further emphasize that although TQM is a proven approach for success in manufacturing, services and the public sector, several organizations failed in their campaigns because of many reasons like lack of top management commitment, ignoring customers, etc. It is therefore necessary for implementers of TQM to understand what the reliable and valid critical success factors of TQM are, and how these factors influence operational and business performances and excellence. The most commonly used critical TQM factors cited in the literature are top management commitment and support, customer focus, supplier's quality management, design quality management, quality data reporting, usage of quality control tools, training, work environment and culture, employee involvement, employee empowerment, quality related training, product quality, and supplier's performance. Some authors have suggested a system approach to the concept of TQM (Hansson, 2003). Hellsten and Klefsjo (2000) declare that TQM does not only consist of values, such as process focus, customer focus or everybody's commitment. However, these values are supported by techniques, such as process management, customer focus planning, or target-oriented groups and control tools such as control charts, the quality house or Ishikawa diagrams. The discussion held by Hellsten and Klefsjo (2000) implies that TQM can be defined as a management system that consists of three units, a system equivalent to the definition that Deming (1994) uses, which means a network of dependent units with a joint goal.

Alongside these factors identified both in theoretical and empirical studies, there are standardized quality models used by firms in practice as a guide for their implementation, or in order to carry out self-evaluations of their quality practices. The main models are the Malcolm Baldrige National Quality Award model in the USA, the European Foundation for Quality Management (EFQM) model in Europe and the Deming Application Prize model in Japan. The Malcolm Baldrige National Quality Award model lists seven categories as the main concepts and values in quality management: leadership, strategic planning, human resources orientation, process management, information and analysis, customer and market focus and business results. The EFQM model consists of the following principles: leadership, employee management, policy and strategy, alliances and resources, process management, people results, customer results, society results and key results (Nabitz et. al, 2000). The Japanese model is grouped into ten chapters, which are in turn divided, as in the two previous models, into a number of sub-criteria in the following way: policies, organization, information, standardization, development and usage of human resources, activities ensuring quality, activities for maintenance and control, activities for improvement, results and future plans. These quality award models have become a standard by which industries are evaluated and awarded for quality initiatives. The models have further contributed to the improvement of quality programmes in industries' production processes.

2.4 Tools for identifying quality problems

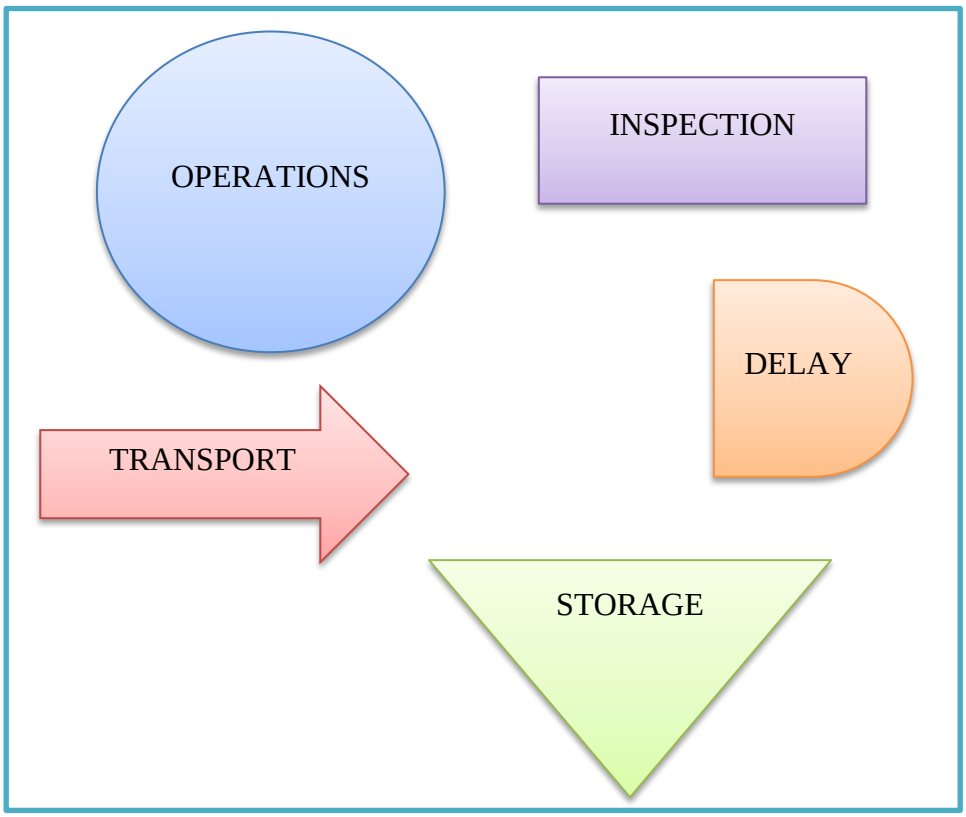
The contribution of Deming and the other quality gurus emphasize that, a major cornerstone of the commitment to quality improvement is the need to identify and prevent the causes of quality problems or defects. These individuals prescribed a number of "tools" to identify the causes of quality problems that are still widely used today. These are: process flowcharts, Pareto charts,

cause-and-effect diagrams, check sheets, histograms, scatter diagrams and statistical process control charts. They are often called the *magnificent seven* or the *seven quality control tools*. The tools attempt to identify the interrelationship among the various elements of a problem. They identify causality and assess the relationship between all of the "what's" and "how's" of a problem. These tools are such that workers at all levels can use them easily. Employees at all levels, in an ISO 9000 plant, use process flowcharts, Pareto charts, run charts, cause-and effect diagrams, and histograms to measure adherence and conformity to documented processes and specifications. In effect, techniques and tools are vital to support and develop the quality improvement process. We review these tools in the subsections that follow.

2.4.1 Process Flow Chart

A process flowchart is a schematic diagram of the steps in a job, operation, or process. It provides a visual tool that is easy to use and understand (Russell and Taylor, 2011). It enables everyone involved in identifying and solving quality problems to have a clear picture of how a specific operation works and a common frame of reference. It also enables a process improvement team to understand the interrelationship of the departments and functions that constitute a process. This helps focus on where problems might occur and if the process itself needs correcting. Development of the flowchart can help identify quality problems by helping the problem solvers better understand the process. The symbols below are used to denote the various components of process flow charts.

Figure 2.2: Process Flow Diagrams

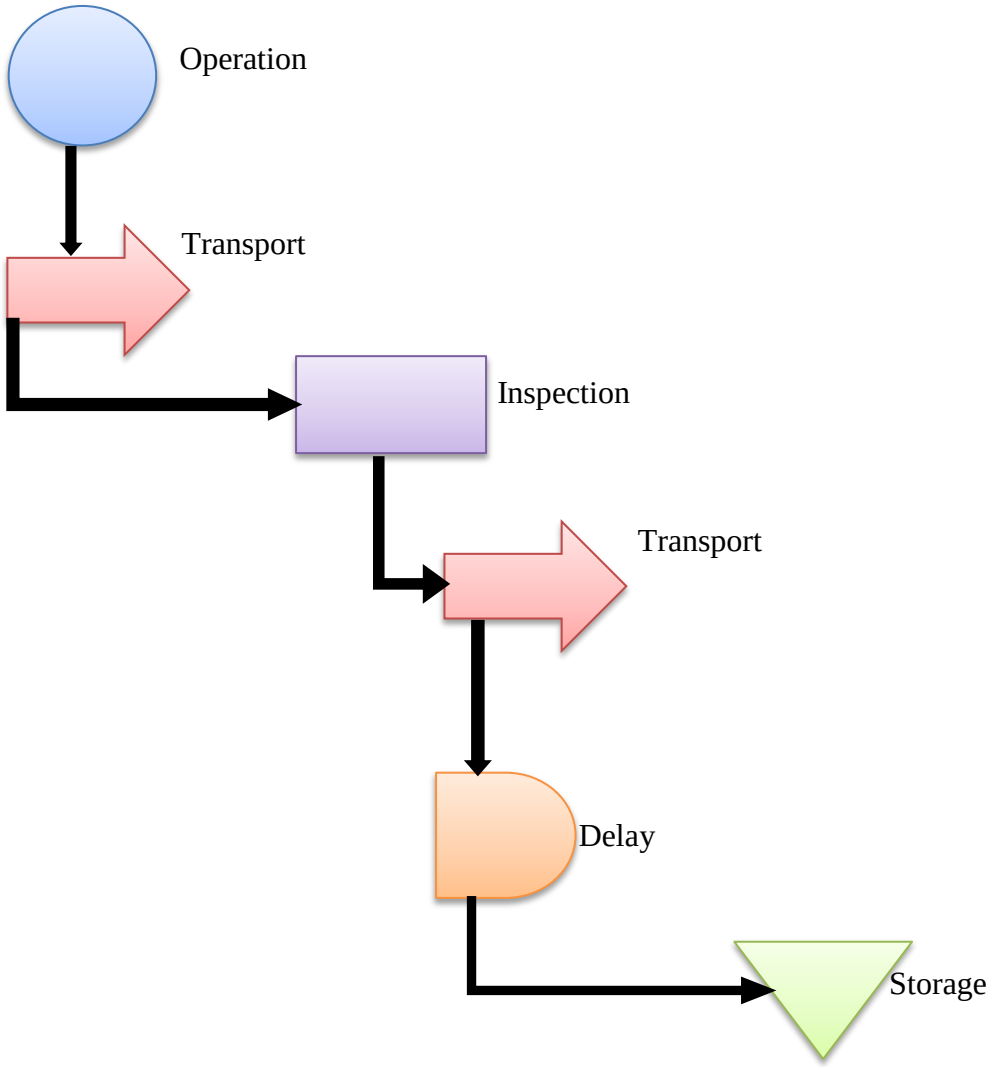


Source: Russell and Taylor, 2011; Stevenson, 2011.

In a typical production process, the symbols above can be used in each step so as to focus on where, in the production process, a quality problem might exist. This enables each employee to quickly identify the quality problem and every effort is made to solve such quality problem. An example of a process flow chart is illustrated below which shows the various steps and how each of the symbols is used. From Figure 2.3, step 1 shows the various steps in a process and how each diagram is used. From a production center, the operation will involve the offloading of raw materials from truck which will be transported or moved for inspection. Raw materials are inspected against quality or breakages resulting from the supplier's processes or during offloading from truck. After inspection, the materials are transported to storage and where delay

occurs it is identified and recorded before the materials are finally stored. The process is continued through production of products and transported to storage again.

Figure 2.3: Process Flow Chart



Source: Russell and Taylor, 2011 page 237.

2.4.2 Check Sheet

A check sheet contains a list of identified defects on a number of defective products observed during a production cycle. The defects are attributed to a number of assignable causes. Check

sheet enables the quality manager or production manager to identify and tally the number of defects from various products at the production units. The identified number of defective products and the different assignable causes are represented with the aid of a diagram by using either a histogram or a Pareto diagram (Russell and Taylor, 2011). This will enable management to either undertake a rework on these products or they are sold as scrap. A checklist can also be used to focus on other dimensions, such as location or time.

2.4.3 Pareto Chart

Pareto analysis is a technique used to identify the causes of poor quality based on the degree of importance of these causes. The logic behind Pareto analysis is that only a few quality problems are important, whereas many others are not critical. The technique was devised by Joseph Juran in the early 1950s. He named this technique after Vilfredo Pareto, a nineteenth-century Italian economist who determined that only a small percentage of people controlled most of the wealth. This concept has often been called the 80–20 rule and has been extended to many areas. In quality management, Juran found out that most quality problems and costs result from only a few causes. For example, he discovered in a textile mill that almost 75% of all defective cloth was caused by only a few weavers, and in a paper mill he studied, more than 60% of the cost of poor quality was attributable to a single category of defects (Russell and Taylor, 2011). Correcting the few major causes of most of the quality problems will result in the greatest cost impact. One way to use Pareto analysis is to develop a chart that ranks the causes of poor quality in descending order based on the percentage of defectives each has caused. It is applied by tallying the number of defectives for each of the different possible causes of poor quality in a product or service and then developing a frequency distribution from the data. This frequency distribution, referred to as a Pareto diagram, is a useful visual aid for focusing on major quality problems.

2.4.4 Histogram

A histogram is a chart that shows the frequency distribution of observed values of a variable. The histogram plotted from selected variables will indicate the type of distribution a particular variable displays, such as whether it has a normal distribution or the distribution is symmetrical. In plotting the histogram, a check sheet is used to tally the number of defectives with all identified causes of poor quality. When the check sheet is completed, the total tally of defects for all the defective products is then used to create the histogram showing the frequency of data relating to a particular quality problem.

2.4.5 Cause-and-Effect Diagram

A cause-and-effect diagram is a chart that identifies potential causes for particular quality problems. It is also called a fishbone or Ishikawa diagram, and it is a graphical description of the elements of a specific quality problem and the relationship between those elements. The "head" of the fish is the quality problem, such as damaged zippers on a garment or broken valves on a tire. The diagram is drawn so that the "spine" of the fish connects the "head" to the possible cause of the problem. These causes could be related to the machines, employees, measurement, environment, materials and process. Each of these possible causes can then have smaller "bones" that address specific issues that relate to each cause. For example, a problem with machines could be due to a need for adjustment, old equipment, or tooling problems. Similarly, a problem with employees could be related to lack of training, poor supervision, or fatigue. Cause-and-effect diagrams are problem-solving tools commonly used by quality control teams. Specific causes of problems can be explored through brainstorming. The development of a cause-and-effect diagram requires the team to think through all the possible causes of poor quality.

Individual causes associated with each category are attached as separate lines along the length of the branch during the brainstorming process. Sometimes the causes are rank-ordered along the branches in order to identify those that are most likely to affect the problem.

2.4.6 Scatter Diagram

Scatter diagrams are graphs that show how two variables are related to one another. They are particularly useful in detecting the amount of correlation, or the degree of linear relationship, between two variables. The greater the degree of correlation, the more linear is the observation in the scatter diagram. On the other hand, the more scattered the observations in the diagram, the less correlation there is between the variables. For example, increased production speed and number of defects could be correlated positively; as production speed increases, so does the number of defects. Two variables could also be correlated negatively, so that an increase in one of the variables is associated with a decrease in the other. For example, increased worker training might be associated with a decrease in the number of defects observed.

2.4.7 Control Charts

Control charts are a very important quality control tools. These charts are used to evaluate whether a process is operating within expectations relative to some measured value such as weight, width, or volume. For example, we could measure the weight of a sack of flour, the width of a tire, or the volume of a bottle of soft drink. When the production process is operating within expectations, we say that it is "in control." Using a control chart to evaluate whether or not a process is in control, involves taking samples at regular intervals from the output of the process to identify the quality defect. The samples collected could either be attributes or variables measure of the product. An attribute is a product characteristic such as color, surface

texture, cleanliness, or perhaps smell or taste. Attributes can be evaluated quickly with a discrete response such as good or bad, acceptable or not, or yes or no. A variable measure however, is a product characteristic that is measured on a continuous scale such as length, weight, temperature, or time. The most commonly used control charts for the evaluation of a process performance for attribute data are the P-charts and C-charts. $\overline{X}$ -chart and R (range)-chart charts are used to evaluate process performance for variable data. From the available sample, the control chart is constructed with a horizontal line through the middle of a chart representing the process average or norm. It also has a line below this center line representing a lower control limit (LCL) and a line above it for the upper control limit (UCL). The emphasis is that, if the measurement is within the upper and lower control limits, the process is said to be in control and there is likely to be no quality problem, but if the measurement is outside the limits, then a problem probably exists and should be investigated and corrected. Statistical quality-control methods such as the process control chart are important tools for quality improvement. Employees provided with extensive training in statistical quality control methods, are able to identify quality problems and their causes and to make suggestions for improvement.

Quality tools can be used to evaluate the acceptability of product quality and to monitor product quality from individual suppliers. They can also be used to evaluate causes of quality problems, such as long transit time or poor refrigeration. Similarly, restaurants use quality control tools to evaluate and monitor the quality of delivered goods, such as meats, produce, or baked goods.

2.5 Quality Management System (QMS)

The American National Standards Institute (2000) defined a quality system as "the organizational structure, responsibilities, procedures, processes, and resources for implementing

quality management. According to Battikha (2003), quality management refers to the set of quality activities involved in producing a product, process, or service, and encompasses prevention and appraisal. Quality activities include the determination of the quality policy, objectives, responsibilities and implementing them through quality planning, quality control, quality assurance, and quality improvement within the quality system. From the above definitions, a quality management system could be a management technique used to communicate to employees what is required to produce the desired quality of products and services and to influence employee actions to complete tasks according to the quality specifications. The purpose of a quality management system would therefore seek to establish a vision for the company, set standards for employees, build motivation within the company, set goals for employees, help fight the resistance to change within organizations and help direct the corporate culture. Properly implemented quality management systems provide a vehicle for achieving quality, that is, conformance to established requirements. In addition, QMS also promotes the improvement of the different processes by continually evolving control systems and optimizing all phases of production and services with a focus on customer requirements and satisfaction. A properly documented quality management system manual specifies requirements for a company to address customer satisfaction, to meet customer and applicable regulatory requirements and to meet ISO 9001: 2008 requirements. This manual determines the processes needed for the quality management system, determines the sequence and interaction of these processes, determines criteria and methods required to ensure the effective operation and control of these processes. It also ensures the availability of resources and information necessary to support the operation and monitoring of these processes. It monitors, measures (where applicable) and analyzes these processes, and implements action necessary to achieve planned

results and continual improvement. These policies will form the bases for QMS. It is important for companies to get familiar with these policies and communicate them with employees at all times.

2.6 International Organization for Standardization 9000 (ISO 9000)

The International Organization for Standardization (ISO), headquartered in Geneva, Switzerland, has as its members the national standards organizations for more than 157 countries. The purpose of ISO is to facilitate global consensus agreements on international quality standards. It has resulted in a system for certifying suppliers to make sure they meet internationally accepted standards for quality management (ISO 9000:2000, 2000). It is a nongovernment organization and is not a part of the United Nations. During the 1970s it was generally acknowledged that the word *quality* had different meanings within and among industries and countries and around the world. In 1979 the ISO member representing the United Kingdom, the British Standard Institute (BSI), recognizing the need for standardization for quality management and assurance, submitted a formal proposal to ISO to develop international standards for quality assurance techniques and practices. Using standards that already existed in the United Kingdom and Canada as a basis, ISO established generic quality standards, primarily for manufacturing firms, which could be used worldwide.

In general, ISO 9000 is an attempt to focus the world's manufacturers on an agreed upon level of quality and standards in products.

2.6.1 ISO Standards

Talha (2004) indicated that ISO standards are an extension of TQM that consists of a series of various quality levels in the work process. Standards are documented agreements that include

technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions to ensure that materials, products processes, and services are fit for their purpose. For example, the format for credit cards and phone cards was derived from ISO standards that specify such physical features as the cards' thickness so that they can be used worldwide. Standards, in general, increase the reliability and effectiveness of goods and services used around the world and as a result make life easier for everyone. The ISO 9000 series of quality management standards, guidelines, and technical reports was first published in 1978, and it is reviewed at least every five years. It was most recently revised and updated in 2008. ISO standard are divided into many elements that make up the guidelines for quality. The elements of ISO 9000 are actually broken into smaller groups which are labeled ISO 9001 through 9004. Each of these succeeding elements is more comprehensive than those preceding them and can be more easily applied to a specific industry. A brief outline of each of these subgroups illustrates the unique characteristics of the ISO 9000.

2.6.1.1 ISO 9001

The ISO 9001 is a model for quality assurance systems in design, development, production, installation and servicing (Talha, 2004). In essence this model specifies the requirement for quality management systems for all organizations. Organizations are therefore expected to demonstrate their ability to provide products that fulfill applicable regulatory requirements aiming to enhance customer satisfaction.

2.6.1.2 ISO 9002

This is a model for quality assurance systems in production and installation. Suppliers are therefore required to ensure high quality of design (characteristics of the product or service) and

quality of conformance (products or services are produced according to design) during production and installation.

2.6.1.3 ISO 9003

This is a model for quality assurance system in final inspection and testing. It is appropriate when conformance to specified requirements is to be assured by the suppliers solely during inspections and testing.

2.6.1.4 ISO 9004

The final model of ISO is a guide for the development of quality management systems which provides detailed guidance to a company for the continual improvement of its quality management system in order to achieve and sustain customer satisfaction.

All of the elements of ISO 9000 can be of great assistance in helping an organization improve quality and the process cycle of their industry. The ISO 9000 is a good guideline for international quality standards that demonstrate the conformity of quality management system to meet customer requirements. Implementation of ISO 9000 procedures not only benefits consumers, but also helps manufacturers or service providers to be more efficient.

2.6.2 Certification

Many companies around the world require that companies they do business with (e.g., suppliers) have ISO 9001 certification. In that way, despite possible language, technology, and cultural differences, a company can be sure that the companies they are doing business with, meet uniform standards, that is, they are "on the same page." ISO 9001:2008 is the only standard in the ISO 9000 family that carries third-party *certification* (referred to as *registration* in the United

States). A third-party company called a registrar is the only authorized entity that can award ISO 9001 certification. Registrars are accredited by an authoritative national body and are contracted by companies to evaluate their quality management system to see if it meets the ISO 9001 standards; if the company does, it is issued an ISO 9000 certification, which is recognized around the world. The worldwide total of ISO 9001 certifications at the end of 2011 was over 1,111,698 (The British Assessment Bureau, 2011). This was a 1% decrease over the total at the end of 2010. ISO 9001:2008 primarily serves as a basis for benchmarking a company's quality-management system. Quality management, in ISO terms, measures how effectively management determines the company's overall quality policy, its objectives, and its responsibilities, as well as its quality policy implementation. A company has to fulfill all of the requirements in ISO 9001:2008 to be certified (except for activities and functions it does not perform at all). Customer satisfaction is an explicit requirement. Thus, to be certified, a company must identify and review customer requirements, ensure that customer requirements are met, and be able to measure and monitor customer satisfaction. The company must also be able to show that measuring and monitoring customer satisfaction leads to corrective and preventive actions when nonconformance (to the standards) is found—that is, continual improvement. This type of analysis of customer satisfaction requires a large amount of data collection and processing.

2.6.3 ISO Registrars

A registrar is an organization that conducts audits by individual auditors. Auditors are skilled in quality systems and the manufacturing and service environments in which an audit will be performed. The registrar develops an audit team of one or more auditors to evaluate a company's quality program and then report back to the registrar. An organization that wants to become a

registrar must be accredited by Registrar Accreditation Board (RAB). ISO certification, or registration as it is called in the United States, is accomplished by a registrar through a series of document reviews and facility visits and audits. The registrar's auditors review a company's procedures, processes, and operations to see if the company conforms to the ISO quality management system standards. The registrar looks at a variety of things, including the company's administrative, design, and production processes; quality system documentation; personnel training records; management reviews; and internal audit processes. The registration process might typically include an initial document review that describes the company's quality management system, followed by the development of an audit plan and then the audit itself. This is usually followed by semiannual or annual surveillance audits to make sure the quality system is being maintained. The registration process can take from several weeks up to a year, depending on how ready the company is for registration. A RAB accredited registrar does not "help" the company attain certification either by giving advice or consulting.

2. 7 Review of Quality Award Models.

Worldwide, there are several Quality Awards, such as the Deming Prize in Japan (1996), the European Quality Award in Europe (1994) and the Malcolm Baldrige National Quality Award in the United States of America (1999). The broad aims of these awards are described as follows by Ghobadian and Woo (1996):

1. Increase awareness of TQM because of its important contribution to superior competitiveness;
2. Encourage systematic self-assessment against established criteria and market awareness simultaneously;

3. Stimulate sharing and dissemination of information on successfully deployed quality strategies and on benefits derived from implementing these strategies;
4. Promote understanding of the requirements for the attainment of quality excellence and successful deployment of TQM;
5. Encourage firms to introduce a continuous improvement process.

Each award model is based on a perceived model of TQM. The award models do not focus solely on either product or service perfection or traditional quality management methods, but consider a wide range of management activities, behavior and processes that influence the quality of the final offerings. They provide a useful audit framework against which firms can evaluate their TQM implementation practices, seek improvement opportunities, and the end results.

The categories of companies that are awarded annually include the manufacturing, services, small businesses (with less than 500 full-time employees), health care, and education. In the U. S., the MBNQA is awarded to stimulate companies to improve quality. It also establishes a criterion for businesses to use to evaluate their individual quality-improvement efforts. It also sets as examples those companies that were successful in improving quality which should help other U.S. organizations learn how to manage quality by disseminating information about the award winners' programs. The EFQM, which is also awarded to recognize outstanding businesses in 16 European countries, is similar in criteria and scope to the MBNQA. The Deming Prize is a Japanese award given to companies to recognize their efforts in quality improvement. All these award criteria focus on the soundness of the approach to quality improvement, the overall quality management program as it is implemented throughout the organization, and customer satisfaction. Table 2.2 below further provides a summary of each model's criteria by which companies are examined for the awards.

Table 2.2: Quality Awards

Awards	Criteria for Award
Malcolm Bridge National Quality Award (MBNQA)	Leadership Information and Analysis Strategic Planning Human Resource Focus Process Management Business Results Customer and Market Focus
European Foundation for Quality Management(EFQM)	Leadership Employee Management Policy and Strategy Alliances and Resources Process Management People Results Customer Results Society Results
Deming Price Model	Policies Organization Information Standardization Development and usage of Human Resources Activities ensuring Quality Activities for Maintenance and Control Activities for Improvement Results and Future Plans

Source: Ghobadian and Woo, 1996.

The creation and subsequent success of these awards have spawned a proliferation of national, international, government, industry, state, and individual quality awards. The Baldrige Award for instance, has had a major influence on U.S. companies, thousands of which request applications from the government each year to obtain a copy of the award guidelines and criteria for internal use in establishing a quality management system. Many companies have made the MBNQA criteria for quality their own, and have also demanded that their suppliers submit applications for the Baldrige Quality Award. Companies that have won the Baldrige Quality Award and have become known as leaders in quality include Motorola, Xerox, Cadillac, Milliken, Federal Express, Ritz Carlton, and IBM (Russell and Taylor, 2011). These and other Baldrige Award winners have become models or benchmarks for other companies to emulate in establishing their own quality management systems (Reid and Sanders, 2013).

2.8 Studies of TQM Practices among Business

Several key elements of TQM strategies have emerged in the literature from reported case studies, conceptual papers, and empirical research. Han et al. (2009) studying 229 pork processors in Eastern China found that the integrated information technology and integrated logistics management improved the quality management practices used and that there was a direct relationship between the quality management practices and the firm's performance. Attention to quality management turned out to be critical to generate sales growth, improve customer satisfaction and provide profits for the company. Furthermore, they showed that the company quality management, supplier/customer quality management, employee involvement, quality design and the quality process management all contributed to overall firm's performance. Mady (2008) assessed the manufacturing policies and practices (cost, delivery, quality, flexibility and innovativeness) in two of the main manufacturing sectors in the country of Kuwait, namely,

food processing and refractors industries (30 and 32 plants, respectively). Different size groups, in both sectors, indicated the same level of focus on quality improvement, cost reduction and innovativeness. Noticeably, the two industrial sectors did not differ significantly in their level of focus on each of the five competitive priorities. The two industries focused on on-time delivery and quality improvement strategies as the two main competitive priorities. Both flexibility and innovativeness were the least emphasized priorities in both sectors. Alsaleh (2007) surveyed 83 food processing and manufacturing companies in Saudi Arabia, the majority of which had been certified to some type of quality system. Quality tools such as the control chart, run chart, histogram, Pareto chart, and cause-and-effect chart appeared to be utilized throughout the production stages, starting from receiving the raw materials to the marketing of the end-products, which revealed some early signs of TQM implementation. Based on these results, he states that the willingness to implement more advanced quality procedures and tools in the future indicates an encouraging future for the food industry. Kumar et al. (2009) studied 15 Canadian finalists in the total quality category of the Canadian Awards for Business Excellence, most of which were from the manufacturing sector. All of them were already at an advanced stage of TQM adoption. The study provided evidence of the positive impact of TQM on company performance in the areas of employee relation, operating procedures, customer satisfaction and financial results. The study revealed that all the companies recorded positive results in the four dimensions. These tangible benefits were felt, on average, 33.3 months after the TQM adoption, with a minimum of six months to a maximum of 96 months. Jayamaha et al. (2008) assessed the validity of the Baldrige Criteria for Performance Excellence by means of data collected from a sample of 91 New Zealand organizations. Their results showed that business results were affected by human resources focus and process management. Process management was equally affected by

customer and market focus, human resources focus and measurement analysis and knowledge management. With respect to human resources focus, the results showed a positive effect on measurement analysis and knowledge management and second by strategic planning. Customer and market focus was positively affected by measurement analysis and knowledge management and secondly by strategic planning. Strategic planning was equally affected positively by leadership and measurement analysis and knowledge management. Finally, the results showed that measurement analysis and knowledge management were largely influenced by leadership. Fening et al. (2008) studied 116 small firms covering all sectors in Ghana. They examined the relationship of each of the MBNQA variables with the five performance indicators of profitability, customer satisfaction, sales growth, employee morale, and market share. All the variables of quality management indicated a positive significant relationship with performance. Fening et al. (2008) reiterated that a combination of variables constitutes quality management and that the implementation of the practices must be done individually at a gradual pace. Su et al. (2008) conducted a survey of 151 ISO 9001 certified manufacturing and service firms in West China. The results suggested that quality management practices (e.g. customer focus, employee training, leadership and top management commitment, cross-functional quality teams, employee involvement, continuous improvement and innovation, quality information, performance measurement and statistical process control) did not have a positive impact on the firms' business performance (sales growth, market share and growth in market share) directly, but had an indirect impact on business performance mediated by quality performance (defects, product quality, durability, reliability, delivery on time) and Research and Development performance (mistakes rate in design, R&D time, competency and cost). Findings from Sue et al. concluded that, the type of industry influences the relationships between quality management practices and

business performance, while competition did not. More specifically, the contribution of quality management practices to the firms' financial and marketing performance was greater in the service firms. Salaheldin (2009) also studied 139 small- and medium-sized enterprises (SMEs) in the Qatari industrial sector. Data analysis revealed three levels of critical success factors of TQM implementation, namely the strategic factor (leadership, organizational culture, continuous improvement, benchmarking, quality goals and policy), the tactical factor (team building and problem solving, employee empowerment, involvement and training, use of information technology, supplier management) and the operational factor (product and service design, process control, customer orientation, resources value addition process, resources conservation and utilization, inspection and checking work). The results showed that there was a substantial positive effect of the TQM implementation on both the operational performance (internal operation in terms of cost and waste reduction, improving the quality of products, flexibility, delivery and productivity) and the organizational performance (revenue growth, net profits, profit to revenue ratio and return on assets, investments in R&D, new products development, market development and orientation). Their findings also confirmed a significant positive relationship between operational and organizational performances of the SMEs and the central role of the strategic factor in the successful implementation of the TQM programmes within the SME. From the above literature, the adoption of TQM has resulted in benefits that can be attained through its implementation. Yet there are still many companies that attempt a variety of quality improvement efforts and find that they have not achieved any or most of the expected outcomes. The most important factor in the success or failure of TQM efforts is the genuineness of the organization's commitment (Reid and Sanders, 2013). Companies often times addressed TQM as another business change that must be implemented due to market pressure without

really emphasizing on the internal issues within the organization (Reid and Sanders, 2013). It is important to note that TQM is a complete philosophy that has to be embraced with true belief, not mere lip service. Reid and Sanders (2013) further reiterated that organizations that addresses TQM as a short-term financial investment is a sure recipe for failure in the implementation of the concept. A further recipe for failure is when responsibility for quality improvement and elimination of defects is solely left with employees other than top management involvement. It is a "let the workers do it" mentality (Reid and Sanders, 2013). A third common mistake emphasized by Reid and Sanders (2013) is when quality managers over- or under-rely on statistical process control (SPC) methods. It should rather be seen as a tool for continuous improvement and necessary for identifying quality problems. According to Mallur et al. (2012), several literature reviewed, identified the reasons for the failure of TQM. This is shown in Table 2.3 below.

Table 2.3: Barriers to TQM Implementation

1. Lack of top management commitment.
2. Lack of leadership.
3. Lack of customer focus.
4. Lack of establish a guiding frame work for TQM.
5. Lack of a formalized strategic plan for change.
6. Inability to change institutional culture.
7. Lack of understanding or inadequate knowledge of TQM.
8. Lack of preparation (No budget, no sponsor)
9. Resistance to change (too busy)
10. Lack of vision, imagination and constancy of purpose.
11. Lack of employee trust in senior management.
12. Traditional belief that TQM costs money.
13. Lack of continuous training and education.
14. Lack of systems and structures for TQM activities.
15. Lack of evaluation procedures and benchmark indices.
16. Lack of resources.
17. Training with no purpose.
18. Costly consultancies, training programs.
19. Inappropriate conditions for implementing TQM.
20. Lack of rewards and recognition.
21. Lack of effective measurement criteria.
22. Barriers between departments.
23. Perception of TQM as an exceptional extra and not as necessity for development.
24. Inflexible and highly bureaucratic institutional structure.
25. Obsolete technology.

Source: Mallur et. al, 2012.

2.9 Relationship between TQM and Organizational Performance

TQM has increasingly been accepted and implemented by many firms as the new paradigm of organizational management largely due to the benefits (either perceived or actual) associated with it (Mensah et. at, 2012). There have been superfluous scholarly works that have focused on the actual relationship between the implementation of TQM and the organizational performance. The developments from literatures have indicated the inability of the researchers to reach a common conclusion regarding the exact impact of TQM on the performance of the implementing organization (Hansson, 2003). One school of thought posits that the underlying principles or

elements of TQM are highly theoretical, abstract and too broad to be practically feasible and beneficial and that TQM is seen "as a faddish concept created on a flimsy footing" (Dooyoung et al., 1998). In an attempt to explain the reasons that have culminated to these negative results of TQM application, researchers have attributed the inability to contextualize and tailor-make such programmes to particular firms depending on the profile of the organization; size, type, geographical locations and prevailing regulatory requirements. Dooyoung et al. (1998) report that the refusal to create an environment that would be receptive to the principles of TQM and designing the programme to suit the system and culture of the organization have been the major explanatory variables why most firms fail to achieve the desired results. Mensah et. at, (2012), reiterated that, an improvement in the performance of an organization, such success cannot only be attributed to the application of the TQM programmes. Montes et al. (2003) stated that, the improvement in performance of an organization might also be due to factors and other paraphernalia accompanying the TQM and not the core programme. Montes et al. (2003) explain that the time duration over which the performance is measured, the scope of application, concurrent event occurring simultaneously with TQM and Hawthorne effects (*an effect in social research in which findings are attributable to the attention of researchers to the subjects of their research rather than to factors significant to the research topic*) as factors that can camouflage and mislead the interpretation between TQM and performance. On the other hand and contrary to the previous school of thought, many researchers and quality consultants assert that the proper implementation of TQM principles or elements positively influence the organizational performance in many dimensions (Mensah et. al, 2012). Mensah et. al (2012) further indicated that, literature available have categorized the performance indicators into four main groups; financial and market performance, organizational effectiveness, customer satisfaction and

employee satisfaction. Below, each category is comprehensively dealt with and relevant works are reviewed and synthesized.

2.9.1 Financial and market performance

The ultimate goal of all profit organizations is the maximization of the returns on every investment made and hence the profitability. Against this backdrop, all managerial decisions including the adoption and implementation of TQM are aimed at enhancing the financial performance and standings of the organization. The literature is filled with superfluity of research that seeks to identify the relationship between the implementation of TQM and the performance of the organization (Hendricks and Singhal, 2001; Hansson and Eriksson, 2002; Kaynak, 2003; Bergman and Klefjo, 2007). A study by Hendricks and Singhal (2001) of 600 national and regional quality award winners in America spanning a ten year period identified significant differences in measured parameters between award winners and the control in periods after award reception. The parameters included in the study are the operating income, sales, total asset, employees and return on asset. This result is corroborated by the findings of Hansson and Eriksson (2002) when they studied Swedish firms that received national and regional awards. Hansson and Eriksson (2002) found that the award winners during the post-implementation period performed better for all the parameters relative to the non-award winners. A possible explanation to these performance differences between award winners and non-award winners might be that given by Curkoviv et al. (2000) in their study to assess the impact of quality related actions on the quality performance of the firm. Curkoviv et al. (2000) purported that, the implementation of the critical factors or elements or principles of TQM directly affect the financial measures such as pre-tax ROA, after-tax ROA, ROI, market share and indirectly affect

the same variables through the improvement of the dimensions of quality such as reliability, durability, responsiveness to customers. Sila (2007) also found that investment in quality and the implementation of TQM led to an improvement in sales, return on asset and market share. In summary, the following relationship between TQM and financial and market performance has been identified in the quality literature: improving product quality through the reduction of waste (lean production) and improving the efficiency of production will increase the return on asset which will increase profitability (Curkoviv et al., 2000; Sila, 2007). Improvement in quality will lead to an increase in the level of satisfaction of customers, and consequently results in greater loyalty. This in turn enables the firm to increase sales and enhance the competitive position of the firms (Bergman and Klefjo, 2007). The cost of production is greatly reduced as a result of less scrapping, rework, and adjustment. This in turn will lead to a larger market share through the offering of lower prices (Sila, 2007). As the elements of TQM are effectively implemented, the performance dimensions of the products and services improve, customers become more satisfied, and the firms can charge higher prices which will increase the profitability of the firm (Bergman and Klefjo, 2007).

2.9.2 Organizational effectiveness

The effectiveness of an organization and its relationship with TQM have been extensively dealt with in quality researches and the results and conclusions drawn by scholars more or less converge around a single point that the implementation of TQM in the organization positively impact on its effectiveness. The relationship between TQM and the financial and market performance if critically analyzed is seen to directly or indirectly encompass a degree of organizational effectiveness. Bergman and Klefjo (2007) contend that organizational focus on

quality improvement more often than not positively affects the productivity of the firm through measures such as decrease in staff turnover and lesser sick leave by employees. Also, by committing one's self to quality, there is the possibility of recording a long term rippling effect on the cost of production and the delivery time although the result might be the opposite in the short-run (Sila, 2007). In the same study to determine the effect of contextual factors on TQM and performance, Sila (2007) also identified a relationship between quality improvement and flexibility, throughput time, product cycle time and inventory cost. According to Sila (2007), TQM practices such as employee empowerment and multi-disciplinary training given to employees result in workforce flexibility which ultimately improves the agility and adaptive capacity of the firm. Deming is reported to have stated that organizational practice of concentrating on a smaller number of suppliers aid in minimizing the total cost of operations since the needed training and technology can be provided easily. Moreover, the quality performance of suppliers can be effectively monitored. This consequently helps to reduce the variability of suppliers' products, improve product quality, as well as reduce delay and rework. Shea and Gobeli (1995) also found similar relationship between TQM and effectiveness of organizations. They studied the experience of ten small businesses and concluded that TQM is not only in big firms and that positive results have been achieved by some of the surveyed firms which suggests that TQM improves the morale of employees, the retention rate of employees and the commitment level of employees for both profit and non-profit organizations. In effect, a quality-oriented organization is good in just-in-time delivery of products, is leaner and cost effective. All these increase the effectiveness of the organization. In summary, the following relationships can be drawn between TQM and organizational effectiveness. Continuous improvement reduces errors and increases the firm's ability to prevent defects (Bergman and

Klefjo¨, 2007; Sila, 2007). Quality improvement helps to reduce the cycle times which in turn improves the productivity of the organization (Bergman and Klefjo, 2007; Kaynak, 2003; Sila, 2007). The establishment of a stable production process helps to reduce the throughput time which improves the delivery performance of the organization (Sila, 2007; Bergman and Klefjo, 2007; Kaynak, 2003). Some underlying principles of TQM help to improve the morale, commitment and loyalty of employees (Shea and Gobeli, 1995). Employee turnover as well as absenteeism is reduced through the implementation of TQM (Bergman and Klefjo, 2007).

2.9.3 Customer satisfaction

To a larger extent, all the practices surrounding TQM are due to the final customers or consumers out there whose needs and expectations are to be met in order to satisfy them. An organization's success in the long-run is largely determined by the degree to which it is able to satisfy its customers. Deming (1986) argues that the most important parameter for measuring the outcome of TQM practices is customer satisfaction. His point is corroborated by most researchers such as Bergman and Klefjo (2007) and Sandholm (2000). As a result of the above, numerous researchers have resorted to identifying the relationship between the implementation of TQM and the impact on customer satisfaction (Kaynak, 2003). Through on-time product delivery and reliability of services, the customer becomes loyal to the offerings of the organization. According to Sila (2007), improving the level of quality performance has a resulting impact on the performance of the workforce. This in turn improves the quality of products and services given to customers. For instance, in the service industry, committed employees tend to be responsive to customers, exhibit high sense of empathy which increases the satisfaction level of customers (Mensah et. al, 2012).

2.9.4 Employee satisfaction

As an internal customer to the organization, employees receive maximum consideration during TQM implementation. As have been seen in the previous sections, all researchers dealing with the identification of factors critical for the success of TQM programme included an aspect that directly or indirectly aims at empowering employees to meaningfully contribute to the quality of the final product. Through employee involvement, empowerment, training and education TQM has been found to correlate positively with employee satisfaction. Shea and Gobeli (1995) found out that the implementation of TQM by small businesses improved the capabilities of employees, increased employee performance and retention, reduced employee turnover, improved employee morale and an overall employee loyalty to the company. Sila (2007) contends that TQM implementation physically and psychologically impacts positively on the working environment within the company. In such situations employees have a greater sense of belongingness within the organization which apparently reflects in the productivity of the entire organization (Sila, 2007). Results similar to that of Shea and Gobeli (1995) were found regarding the link between TQM and employee turnover and absenteeism. According to Deming, pride of workmanship (how capable employees feel towards the delivery of superior quality of products and services to customers) by default, leads to high customer satisfaction.

2.9.5 Product Quality

There is no single definition of product quality. However, some authors viewed product quality as a "performance to standards" or "tolerance determined by its designers" or "technical requirement". Some concluded that, product quality is influenced by customers' requirements,

competitive evaluation, product characteristics and the relationship mix (Talha, 2004; Reid and Sanders, 2013).

TQM experts, (Deming 1986; Crosby 1979; Feigenbaum 2001) identify three (3) characteristics of product quality. These include quality of design, quality of conformance and quality of performance. Product quality involves the degree to which quality characteristics are design into the product. Russell and Taylor (2012), provided further explanation on how customers identifies the quality of manufactured product, that is, product features, product aesthetics and perceived quality (brand name). According to Teeratansirikool et al, (2012), focused on product quality improves firms performance. Their study revealed a positive relationship between product differentiation and profit. A number of studies also found that firms that chose differentiation as competitive strategy outperform their competitors. It can therefore be argued that, firms innovativeness in product quality directly or indirectly affect performance (Olson and Slater, 2002; Gosselin, 2005).

2.10 Critical Factors for TQM Implementation

2.10.1 Top Management Commitment

Top management commitment is vital in the implementation of TQM. Chrusciel and Field (2003) defined top management commitment as an active and visible support or commitment from the management of the organization, often in the form of a champion for the application. Top management commitment is seen as a critical factor for performance excellence-an organizational change strategy (Ciptono, 2008).

A predominant issue in quality management literature is that strong commitment from top management is vital. This therefore means that, leadership is very critical in implementing TQM

system. The concept of leadership is the ability for top management to establish, practice and lead a long-term vision of an organization. Certain roles of top management can be identified as establishing quality policies, establishing and deploying quality goals, providing resources, providing problem-oriented training, and stimulating improvement. Recognition of the critical role of leadership and its responsibility in pursuit of continuous quality improvement echoes the arguments put forward by quality gurus such as Edward W. Deming, Joseph M. Juran and Philip B. Crosby. The European Foundation for Quality Award (EFQA) and the Malcolm Baldrige National Quality Award (MBNQA) further recognize the crucial role of leadership in creating the goals, values and systems that guide the pursuit of continuous performance improvement. Demonstrating such commitment is therefore a primary leadership principle for achieving TQM because lack of top management commitment is one of the reasons for the failure of TQM.

2.10.2 Customer Focus

TQM value also emphasize on customer focus in implementing the TQM system. Customer focus can be defined as the degree to which a firm continuously satisfies customer needs and expectations (Karani and Bichanga, 2012). A successful firm recognizes the need to put the customer first in every decision made. The key to quality management is maintaining a close relationship with the customer in order to fully determine the customer's needs, as well as to receive feedback on the extent to which those needs are being met. The customer should be closely involved in the product design and development process with input at every stage so that there is less likelihood of quality problems once full production begins. Deming (1986) suggested that the customer is the most important part of the production line; products should be aimed at the needs of the customer. Obtaining customer complaint information is to seek

opportunities to improve product and service quality. Quality complaints have different problems that require different actions. To improve customer focus efforts, customer complaints should therefore be treated with top priority in the implementation of TQM. Furthermore, obtaining customer satisfaction information is essential for pursuing customer focus efforts. Intensive examination of finished products from the viewpoint of the customer can be a useful predictor of customer satisfaction. Such information includes data on field failures and service-call rates, and analysis and reporting of customer attitude trends regarding product quality.

2.10.3 Employee Participation

Employee participation or involvement is the process of empowering the members of the organization to make decisions and to solve problems appropriate to their levels in the organization (Sangeeta & Banwe, 2004). Employee participation can therefore be the degree to which employees in a firm engage in various quality management activities. By personally participating in quality management activities, employees acquire new knowledge, see the benefits of the quality disciplines and obtain a sense of accomplishment by solving quality problems. Employee participation is exemplified by things such as teamwork, employee suggestions, and employee commitment. A remarkable characteristic of employee participation is teamwork (e.g., cross-functional teams and within-functional teams). The aim of a team is to improve the input and output of any stage. A team may well be composed of people from different staff areas, everyone having a chance to contribute ideas, plans, and figures. Teamwork is solely needed throughout the firm; it can compensate one's strength for another's weakness (Deming, 1986). Group work and group decision-making offer several advantages over individual effort. If several knowledgeable people are brought into the decision-making process,

a number of worthwhile possibilities may be uncovered, making synergy a possible benefit. To have an effective employee participation, employee contributions and ideas must receive serious consideration and be placed into operation whenever the recommendations are sound and relevant. According to Evans and Lindsay (2002), it also means giving people authority to make decisions based on what they feel is right, to have control over their work, to take risks and learn from mistakes and to promote change. This according to Barker and Cagwin (2000) leads to significant savings by reducing defects and the need for rework. Production workers should regularly participate in operating decisions such as planning, goal setting, and monitoring of performance. They should therefore be encouraged to make suggestions and take a relatively high degree of responsibility for overall performance as emphasized by Deming.

2.10.4 Process Control and Continuous Improvement

A process consists of one or more actions that transform inputs into outputs (Russell and Taylor, 2011). These include the combination of machine, tools, methods, materials, and people engaged in production. A key part of any total quality strategy is the management of processes and their improvement. Process control and continuous improvement allow individuals involved in the day-to-day operations to change and improve processes and work flows as they see fit. Traditional systems operated on the assumption that once a company achieved a certain level of quality, it was successful and needed no further improvements (Zhang et. al, 1999). However, the more experience the organization gains in applying this technique, the more gradual the improvement will be (Balbastre and Moreno Luzo´n, 2003). Process management focuses on managing the manufacturing process so that it operates as expected, without breakdowns, missing materials, fixtures and tools. One aspect of process management is equipment

maintenance, which ensures that variation is kept within acceptable bounds, keeping the manufacturing process running smoothly (Zhan, 2000a). Zhan (2000a) further stated that, good process management also involves precisely defining and documenting process management procedures, with instructions for machine operation and set-up posted at each work station, in order to minimize the likelihood of operator error. Balbastre and Moreno Luzo´n (2003) emphasized that, the focus of continuous improvement is closely linked to process management and have two clearly defined objectives. That is, there is a controlled variability of processes in order to ensure conformity in the execution of a pre-established design, thereby achieving homogeneity and a lack of errors or waste. On the other hand, it enables improvement in the processes because it allows us to understand them better as it employs a large variety of techniques, such as applied statistics techniques and others like PDCA (Plan, Do, Check, Act), and the Ishikawa Diagram.

2.10.5 Education and Training

Education and training forms a vital part of TQM. Education and training are some of the key elements of total quality in which many people are involved (Russell and Taylor, 2011). Therefore, the success of the implementation depends directly on how well they have been done. In his 14 points contribution to TQM, Deming emphasize that, organizations must institute vigorous education and training programs in methods of quality improvement throughout the organization, from top management to lower management, so that continuous improvement can occur (Russell and Taylor, 2011). Many research results reveal that education and training are one of the most important elements in a successful implementation of total quality management (Zhang et. at, 1999). The research confirms what most organizations already realize, namely, that

education and training are an integral and essential part of the TQM initiative (Zhang, 2000b). Investment in education and training is vitally important for TQM success. In an organization, all of the management, supervisors, and employees should accept quality education and training. Quality education and training include quality awareness education and basic quality management methods, such as statistical process control, problem solving methods, basic tools and techniques.

2.10.6 Recognition and Awards

Recognition is seen as the public acknowledgment of superior performance of specific activities Abdullah et. al, 2008). Abdullah et. al, (2008) reiterated that rewards are benefits, such as increased salary, bonuses, and promotion which are conferred for generally superior performance with respect to goals. An organization's total quality management initiative must be supported with a recognition and reward system that encourages and motivates employees to achieve the desired performance. Organizations that are serious about achieving quality and customer satisfaction must integrate these aspects of TQM into their recognition and reward system. Many other writers have also highlighted the importance and criticality of the rewards and recognitions in the quality improvement process (Rao et al., 1999; Dayton, 2001; Li et al., 2001; Everett, 2002). Russell and Taylor (2011) further explain that, employees' satisfaction is increased when achievement is reinforced through rewards and recognition. Recognition and reward activities in organizations should effectively stimulate employee commitment to quality improvement activities otherwise these activities are failures (Zhang, 2000). Some methods of recognition and rewards include working condition improvements, salary increments, position promotions, financial awards for excellent suggestions are good methods for recognition and reward (Zhang,

2000). Other writers have also highlighted the importance and criticality of the rewards and recognitions in the quality improvement process (Dayton, 2001; Everett, 2002).

2.10.7 Supplier-Producer Quality Management

Supplier quality management is defined as the set of supplier related quality management practices for improving suppliers' quality of products and services (Karani and Bichanga, 2012). This is exemplified by firm-supplier partnership, product quality as the criterion for supplier selection, communication with suppliers, and understanding of supplier performance and supplier quality audit (Zhang, 2000). The Malcolm Baldrige Quality Award also recognizes the importance of supplier quality. Many authors advocate that companies must establish supply chain partnerships to motivate suppliers to provide materials needed to meet customer expectations (Lau and Idris 2001; Thiagarajan et al. 2001). Furthermore, having effective supply chain management can contribute to the quality performance in many ways. Regular supplier evaluations help organizations to share information and improve mutual understanding. Long-term partnerships/relationships with suppliers also help the parties involved to solve quality problems and invest in quality improvement efforts (Pun et. al, 2002). Supplier partnership is a means of developing relationships with suppliers to ensure that they understand the customer's specific requirements and needs. Further, reducing the number of suppliers provides better control and fosters a mutually beneficial climate of continuous improvement (Quality Management and Training Newsletter, 2010). Motwani (2001) suggested that suppliers/vendor partnerships should be based on a quality program and accepted documentation of progress towards continuous improvement in quality.

2.11 Conceptual Model

From the reviewed literature, TQM can be considered as three different approaches in this study. This includes contributions from quality gurus, formal evaluation models and empirical research. From the perspective of these quality gurus, Montasser and Manhawy (2013) reiterated that in 1982 and 1986, Deming underlined the use of statistical techniques for quality control, and proposed his 14 principles to improve quality in organizations, based on the following ideas: leadership, an improvement philosophy, the right production from the beginning, training for managers and employees, internal communication aimed at the elimination of obstacles for cooperation and the suppression of quantitative objectives. Tari's (2005), review of literature summarized the various contributions by these quality gurus. Juran (1986) pointed out the importance of both technical and managerial aspects. He stressed that the aim of management is to reduce cost of mistakes to reach a minimum total cost level. Ishikawa in 1976 and 1985 emphasized the importance of training, the usage of cause-effect diagrams for problem solving, and quality circles as a way to achieve continuous improvement. In 1979, Crosby further defined steps for quality improvement which include top and intermediate management commitment, quality measurement, and evaluation of quality costs, corrective action, training, a zero-defect philosophy, objective setting and employee recognition. Lastly, Feigenbaum in 1991 described the notion of total quality, based mainly on leadership and an understanding of the aspects of quality improvement, a commitment to incorporate quality in the firm's practices, and the participation of the entire workforce, the objective being the reduction of total quality costs. These initial contributions by the quality gurus have been identified as the various elements for effective quality management. These elements have become critical factors and the core of TQM implementations. The factors include customer focus, leadership, quality planning, management

based on facts, continuous improvement, human resource management (involvement of all members, training, work teams and communication systems), learning, process management, cooperation with suppliers and organizational awareness and concern for the social and environmental context. Alongside these factors identified both in theoretical and empirical studies, the second approach is the standardized quality models used by firms in practice as a guide for their implementation, or in order to carry out self-evaluations of their quality practices. The main models are the Malcolm Baldrige National Quality Award model in the USA, the European Foundation for Quality Management (EFQM) model in Europe and the Deming Application Prize model in Japan.

All these award criteria focus on the soundness of the approach to quality improvement, the overall quality management program as it is implemented throughout the organization, and customer satisfaction. The creation and subsequent success of these awards have spawned a proliferation of national, international, government, industry, state, and individual quality awards.

A review of the literature also shows that, TQM is not just a mere set of factors and a network of interdependent components, but a management system consisting of critical factors, techniques and tools. In fact, these techniques and tools are vital to support and develop the quality improvement process. Tari (2005), identified the tools and techniques most widely used by firms, as shown in Table 2.5.

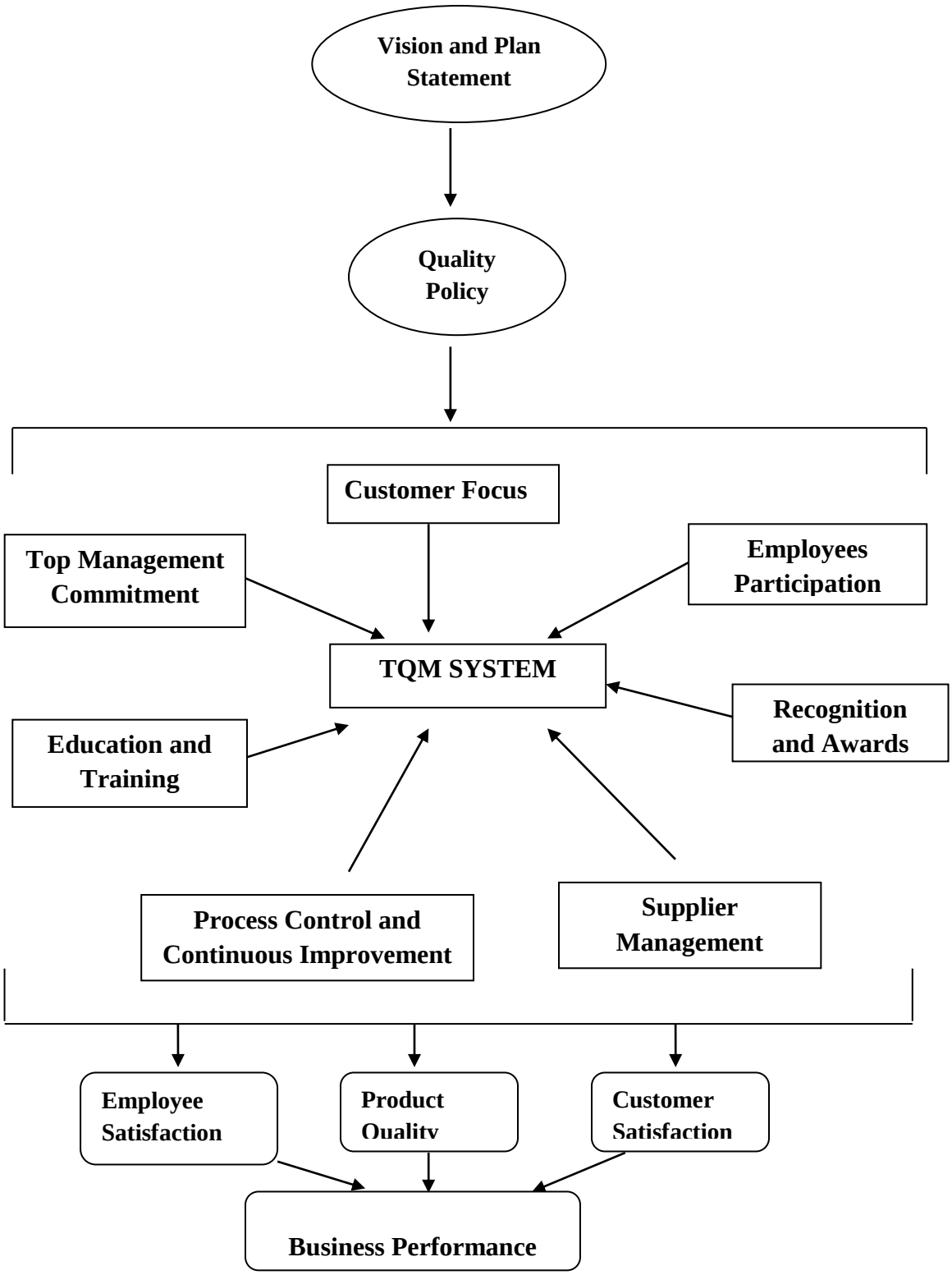
Table 2.4: Tools and Techniques for Quality Improvement Process

Seven basic quality control Tools	**Other Tools**	**Techniques**
Flow Charts	Brainstorming	Benchmarking
Cause-and-Effect Diagram	Control Plan	Department Purpose Analysis
Check Sheet	Force field analysis	Design of Experiment
Pareto Charts	Questionnaire	Failure mode and effects Analysis
Scatter Diagram	Sample	Fault Tree Analysis
Histogram		Problem solving Methodology
Statistical control Charts		Quality Improvement Teams

Source: Tari, 2005.

Based on the above three approaches (contributions from quality gurus, formal evaluation models and empirical research), a conceptual model of TQM implementation on overall organization performance was developed and displayed in Figure 2.4. The links between TQM implementation, employee satisfaction, product quality, customer satisfaction and strategic business performance are incorporated in the model.

Figure 2.4: Conceptual Model of TQM Implementation and its impact on Organization Performance



(Author's construct, 2013)

Figure 2.4 above explores how an organizations' vision and mission statement can be translated into a good quality policy and plan through which a TQM system is developed. An established TQM system is further implemented on certain values and principles of Total Quality Management. A well implemented TQM results in employee satisfaction, product quality and customer satisfaction. An overall organization performance is lastly achieved through employee satisfaction, product quality and customer satisfaction. The proposed model in Figure 2.4 with the various elements is to be considered are explained below.

A vision statement from in the model above is described as how a firm wants to be seen in its chosen business. As such, it describes standards, values, and beliefs. Above all, a vision is the advertisement of the intention to change (Zhang, 2000a). As such, it propels the firm forward and acts against complacency. All employees should be able to realize how they can contribute to the vision. The intent of a vision statement is to communicate the firm's values, aspirations and purpose, so that employees can make decisions that are consistent with and supportive of these objectives. An effective vision statement tends to be written using language that can inspire employees to high levels of performance, and further, to foster their commitment. Therefore, a firm should have a long-term vision statement. A plan statement is a formalization of what is intended to happen at some time in the future. Zhang (2000a) further stresses that, a plan cannot guarantee that an event will actually happen; it is a statement of intention that "will happen". In a firm, there are many kinds of plans, including a strategic business performance plan, quality goal plan, and quality improvement plan. The vision and plan statement are translated into a quality policy and quality plan. A quality policy is overall intentions and direction of an organization with regard to quality, as formally expressed by top management (ISO 9000, 2005). Similarly, a quality policy describes how a firm wants to be seen regarding its quality. In this regard, a

quality policy is a quality vision statement. A variety of employees should be involved in the development of the vision statement and quality policy, which in return, should be well communicated to employees at different levels to stimulate commitment. In fact, a vision statement usually goes down to mission statements that detail short-term firm goals or departmental aims. A quality goal plan can involve, for example, conformity rate, defect rate, internal failure costs, external failure costs, performance, reliability, and durability. A quality improvement plan aims for quality improvement, which is action taken throughout the organization to increase the effectiveness and efficiency of activities and processes in order to provide added benefits to both the organization and its customers (ISO 9000, 2005). Employees at different levels should be involved in drawing up these plans, which should be well communicated to them, in turn encouraging their commitment to the realization of these plans.

A TQM system is further implemented through the understanding of the quality policy and plan established. For a TQM system implemented to fully work, certain values need to be well incorporated into the system. These values are the basic principles that have evolved over the years to be the core factors of TQM implementation. These values must be further linked to one another in other to achieve a successful implementation.

2.11.1 Business Performance

Using these key critical factors or values (TMC, CF, PC, EP, ET, RR and SQM) in TQM implementation results in employee satisfaction, product quality and customer satisfaction (Curkovic et. al, 2000: Salaheldin, 2009). In the long run, the positive effect of these results is translated into high organization performance. The performance among other things will include

i. Profitability

ii. Competitive advantage over other firms

iii. Low cost of production

iv. Good Maintenance Culture

v. Product quality and design

vi. Increase in Productivity

vii. Employee Satisfaction

viii. Customer Satisfaction

Thus, for TQM to be well implemented, these values must be communicated at all levels within the organization: strategic level, tactical level and operational level.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents an overview of the methodological perspective of the thesis. Section 3.1 describes the research design based on the strategies adopted for this thesis. Section 3.2 presents a description of the population for this study and Section 3.3 also explains the sampling procedure adopted. The source of data for this study is explained in Section 3.4, while Section 3.5 provides the data analysis technique applied for the data collected for this thesis. Finally, Section 3.6 and Section 3.7 provide the ethical consideration and data reliability and validity respectively.

3.1 Research Design

The design is the basic plan for a piece of empirical research, and includes main ideas such as strategy, sample, and the tools and procedures to be used for collecting and analyzing empirical data (Punch, 2000). The role of research design is to connect the questions to data.

This study adopted the positivist approach. According to Neuman (2007), positivism assumes that social reality is made up of objective facts that value-free researchers can precisely measure and use statistics to test causal theories. Neuman (2007), also emphasize that positivists use other quantitative research techniques such as survey. Therefore, the conclusion is that, results provided are certain, even when bounded by probabilities of correctness. This is the traditional approach of the physical sciences and it is also dominant in established social sciences disciplines such as psychology and economics (Kidd, 2002). Concepts such as reliability,

validity and statistical significance are used carefully in good hard-positivist research with the purpose of describing some part of reality with certainty. There may be caveats placed on this certainty but the background assumption is always that it is possible to determine the extent to which reality has been described (Nancarrow et al., 2001). A hard positivist ontology asserts that an objective reality is out there to be found and epistemologically this can be done with knowable degrees of certainty using objectively-correct scientific methods (Carson et al., 2001; Long et al., 2000; Neuman, 2003). Using a positivist approach to this study, provided the researcher with an opportunity to explore and empirically test the factors that influences TQM and ISO 9000 implementation using quantitative techniques.

For the purpose of this study, a survey approach and quantitative methods were used. The survey approach was used to sample manufacturing firms in Accra and Tema. A cross-sectional method was also used to explore, describe or explain how manufacturing firms perceive TQM and ISO 9000. Structured questionnaire and interview schedules were further developed as tools to collect data from the firms. The questionnaire sought to find out the characteristics of the firms selected. These include the classification of the company (multinational or national), classification by size, ownership and the type of product the firm produces. The second part of the questionnaire contained statements on the implementation status of TQM and ISO 9000 practices among the firms while the third part concerned the level to which business performance is achieved with respect to the implementation of the critical factors or elements in TQM. By providing an in-depth analysis or description of the selected firms, a qualitative technique was applied. Hanson and Grimmer (2007), stress that, most qualitative research is carried out to gain and describe complexity. Qualitative research also provides a concentration on understanding and interpretation of the subject selected (Carson et al., 2001). However, a quantitative technique was

further developed to measure the extent to which the critical factors affect TQM implementation and also their impact on overall business performance.

3.2 Population and Sample Size

The population of the study primarily was manufacturing firms in Ghana. These firms include both multinational and local manufacturing firms in the country. The selections of these two categories of firms are because, the multinational firms are believed to be more exposed to TQM concepts than the local firms and hence a study of the two categories provided interesting information for this thesis. These firms are structured into sizes and sectors. The firms are categorized into small size, medium size and large size (this is based on asset based and on the number of employees in each firm). In terms of importance, the manufacturing sector, though not strong as it should be, continues to play a respectable role in the economy, contributing about 9% to GDP. Ghana's most important manufacturing industries include aluminium smelting, agro-food processing, oil refining and cement. Other industries include the production of beverages, textiles, apparel, glass, paints, plastics, chemicals and pharmaceuticals, and the processing of metals and wood products. The sector provides employment for an estimated workforce of over 250,000 people. About 25,000 firms are registered. More than 80% of them are small size enterprises with less than 50 employees, while it is estimated that 55% of all enterprises are located within the Greater Accra/Tema Regions (National Communication Corporation Limited for UNESCO Annual Report 2009/2010). These two cities hold about 55% of the manufacturing industry in Ghana. Accra is the national capital and the most popular city with many of the firms in manufacturing. Tema is also the most industrialized city in the country.

The selection of the firms for the study was based on three (3) criteria. Firstly, the firms must be listed in the Ghana Club 100, the Ghana Stock Exchange market and Association of Ghana

Industries. The second criterion is numerical strength (number of employees) of the firms. For this study, the firms considered are sole proprietorship, partnership, public and limited liability. Any sole proprietorship that satisfies the first criterion and has between 0 and 100 employees was selected. Similarly, employee strengths considered for partnership, public and limited liability were 0 to 1000, 0 to 1000, and 1000 and above. The third criterion used is the diversity of products, that is, the different types of products produced by each firm selected. These products include aluminium product, agro-food processing, cement, beverages, textiles, apparel, glass, paints, plastics, chemicals and pharmaceuticals, and metals and wood products.

These three criteria yielded sixty (60) firms for the study. The composition of these firms was based on earlier pilot test conducted. From the pilot test, ten (10) multinational firms indicated to have adopted TQM. Of the fifty (50) remaining firms, 20 local firms indicated to have adopted TQM and the remaining 30 were also local firms which indicated no adoption or have a low degree of awareness of TQM and ISO 9000. Manufacturing firms were selected for this study because manufactured goods are tangible in nature and are easily measured for quality characteristics. Indeed these firms were also selected because manufactured products require high quality since they are consumables, and hence suitable for this study.

3.3 Sampling Procedure

A probability sampling technique was adopted for the study. The essential characteristics of probability sampling are that a procedure is devised where each of the items is given a known chance of inclusion and the procedure is used for the selection of the items (Curwin and Slater, 2008). The study used a simple random technique for selecting the firms. Simple random

sampling involves the development of an accurate sampling frame, then selecting the elements from the sampling frame according to a mathematical random procedure and further locating the exact element that was selected for inclusion in the sample. Simple random sampling is both the easiest random sample to understand and the one on which other types are modeled (Nueman, 2007).

For this study, the sampling frames were the 2011 Ghana Club 100 listed firms, the Stock Exchange Fact book and Association of Ghanaian Industries (AGI) list. The sampling elements therefore become the selected manufacturing firms from the Ghana Club 100 list, Stock Exchange Fact Book and Association of Ghanaian Industries (AGI) list. The Ghana Club (GC) 100 is an annual compilation of the top 100 companies in Ghana to give due recognition to successful enterprise building and was launched in 1998 by the Ghana Investment Promotion Centre (GIPC). The GC 100 is about corporate excellence. Companies making it into the GC 100 are to serve as role models for the private sector and provide a forum for corporate Ghana to interact with the government at a high level. From the 2011 compilation, a total of 15 manufacturing firms were given due recognition for corporate excellence. On the other hand, the Association of Ghana Industries (AGI) is a voluntary business association of over 1200 members, made up of small, medium and large scale manufacturing and services industries in agro-processing (food and beverages), agri-business, pharmaceuticals, electronics and electrical, telecommunications, information technology, utilities, service industries, transport, construction, textiles, garments and leather, banking and advertising. Membership is open to all registered companies engaged in manufacturing or provision of services to the manufacturing sector. The Ghana Stock Exchange market is also a platform that provides Ghanaian firms with an opportunity to trade in shares by allowing the public to invest in such firms. It currently has

around 36 listed companies and 2 corporate bonds. All types of securities can be listed. Criteria for listing include capital adequacy, profitability, spread of shares, years of existence and management efficiency. The manufacturing and brewing sectors currently dominate the stock exchange. A distant third is the banking sector while other listed companies fall into the insurance, mining and petroleum sectors. Most of the listed companies on the GSE are Ghanaian but there are some multinationals. Firms selected from the above sampling frames were based on ownership, level of TQM adoption and location of business since the study is within Accra and Tema metropolis.

3.4 Source of Data

Data collected for this study was solely from primary sources. Data from primary sources included questionnaires and interviews of quality control managers and operations/production managers from the selected companies. The questionnaire sought to find out the characteristics of the firms selected. These include the classification of the company (multinational or national), classification by size, ownership and the type of product the firm produces. The second part of the questionnaire contained statements on the level of awareness, perception and implementation status of TQM and ISO 9000 practices among the firms while the third part concerned the level to which business performance is achieved with respect to the implementation of the critical factors or elements in TQM. Data on customer satisfaction level were solely collected from customers from the firms selected for the study. The customers included companies and individuals who are user of the manufactured products. The customers were randomly selected from the list provided by the manufacturing firms. Five (5) customers were randomly selected from each category of manufacturing firms used for this study. A total of 275 customers were used to survey the customer satisfaction with the products of the firm. Each customer was asked

to rate their satisfaction level on product usage, quality of product, reliability and response to his/her complaints. Similarly, 275 customers were also used to survey the quality of firms' products they use. Data on employee satisfaction were sought directly from employees among the firms surveyed. In all 300 employees were used to rate employees satisfaction. 100 employees were randomly selected from each of the three (3) categories of firms used.

3.5 Data Analysis

The data collected for this study were both qualitative and quantitative data. The data collected was analyzed using SPSS 20 and presented in the form of tables, chart, graphs and percentages. The tables, charts, graphs and percentages identify the frequency distribution which was used to describe the characteristics of the respondents and in addition descriptive statistics were used to measure the averages (mean) of the respondents. The seven factors used in the study were tested using a Reliability analysis. Cronbach's alpha was therefore used to ensure consistency to the degree of homogeneity of the factors used. The value of the alpha coefficient ranges from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (that is, question with two possible answers) and/or multi-point formatted questionnaires or scale (Karani and Bichanga, 2012). A higher value shows a more reliable generated scale. Nunnally (1970) has indicated 0.7 to be an acceptable reliability coefficient

Lastly, measuring the relationships between the latent constructs/critical factors of TQM and their different contribution to Employee satisfaction, Quality product, customer satisfaction and business performance, Friedman rank test for multiple comparisons was used. The Friedman test is non-parametric test used to test for differences between groups when the dependent variable being measured is ordinal. The objective is to ascertain whether or not the various practices

(factors) are present to the same extent. To increase the reliability of the measurement, assumptions under Friedman test, were checked for violations.

The formulas used are as follows:

The Cronbach's alpha (Reliability coefficient) is computed as follows (Black, 1999):

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum V_i}{Vtest}\right)$$

n = number of questions

V_i= variance of scores on each question

V test = total variance of overall scores on the entire test.

$V_i = p_i * (1 - p_i)$

p_i = percentage of firms responses.

V test = $V_i * n$

3.6 Ethical Consideration

Ethics are guidelines or sets of principles for good professional practice, which serve to advice and steer researchers as they conduct their work (Bloor and Wood, 2006). The word ethics is derived from the Greek word *ethos* meaning a person's character, nature or disposition. Ethic is also a branch of philosophy which is concerned with thinking about morality, integrity and the distinction between right and wrong. Social scientists typically engage in researching issues and consequently it is inevitable that ethical problems will emerge from their research. This does not mean that researchers should avoid sensitive topics, but rather the methods by which the research

is conducted should be ethically justifiable. Further, Bloor and Wood (2006) stress that, professional ethics relate to the willingness of a profession to self-regulate the actions of its members so as to protect the interests of the public. This research is guided by two main issues under ethical consideration namely, professional integrity and responsibilities to research participant.

3.6.1 Professional Integrity

The scientific community demands ethical behavior on the part of the researcher to be professional in reporting the results of the research. The researcher in this case acted professionally in the areas of research fraud and plagiarism. The researcher avoided the falsification of or distorting data or the methods of data collection or plagiarizing the work of others. The researcher did not also depart from the generally accepted scientific practices for doing and reporting on research. Lastly, the researcher did not fake or invent data but honestly and fully reported how the study was conducted.

3.6.2 Responsibility to Research Participant

According to Bloor and Wood (2006), the responsibilities to research participants include informed consent, protection of identity and the principle of "no harm". The researcher sought the permission from the firms whose data were used for this study. The researcher briefed all participants from the selected firms the nature of the research, what would be required from participation, why it is being undertaken and how the information is disseminated. Accordingly, any data used in this study were voluntarily provided by the selected firms. The researcher

further provided participants with detailed information as far as practicable and respondents were assured that information collected was strictly for academic purposes.

3.7 Reliability and Validity

Scientific research is typically evaluated using measures of rigour such as reliability, validity and generalization. According to Bloor and Wood (2006), reliability is concerned with the extent to which research findings are reproducible, that is whether a different researcher who replicated the study would come to the same or similar conclusions. Green (2002), further reiterated reliability to the degree of consistency with which an instrument measures the attribute it is designed to measure. The strategies used to improve reliability in this study included maintaining meticulous records of fieldwork and documenting the process of analysis so that others could follow the process. Reliability was also improved through a rigorous comparison of coding of data several times in resolving ambiguities of results from analysis.

Validity on the other hand, is the extent to which the research produces an accurate version of the world (Bloor and Wood, 2006). That is how well an idea about reality fits with actual reality. In achieving validity, questionnaires used included a variety of questions on the theory and implementation of TQM. The questions were based on the information gathered during the literature review to ensure that they represent factors that affect TQM implementation and hence on business performance. In addition, internal and external validity were ensured. For internal validity, the researcher's conclusions correctly portray the data collected. Possible internal errors were minimized during the design of this thesis. According to Gatewood and Field (2000), external validity refers to the extent to which study findings can be generalized beyond the sample used. The conclusions for this thesis can therefore be appropriately generalized to similar population and locations outside of the study area.

CHAPTER FOUR

DATA AND DATA PRESENTATION

4.0 Introduction

This chapter provides a summary and interpretation of the responses obtained from the questionnaire administered. The questionnaire sought to collect information on the level of understanding and implementation of Total Quality Management (TQM) among manufaturing firms in Ghana. Manufcturing Firms were categorised into three (3) types namely Multinational firms with TQM adoption, Local manufacturing firms with TQM adoption and Local maufacturing firms without TQM adoption. The number of firms from each category used in the study are 10, 20, and 30 respectively. Out of the 60 questionnaires issued, 55 were successfully filled, returned and taken as valid samples giving a response rate of 91.67%. This represents 8 Multinational firms, 20 Local firms with TQM adoption and 27 Local firms without TQM adoption. The first part of this chapter focuses on the characteristics of the firms interviewed regarding firm classification, number of employees, type of products and review of quality policies. The second part focuses on the consistency of the factors used in measuring effect of TQM implementation. The third part addressed the awarness, perception level and satisfaction level of TQM concept and implementation. Section four focuses on the quality management practices applied by the firms interviewed. The next section present the evaluation of factors in TQM implementation. In addition, the overall business performance with respect to employee satisfaction, product quality and customer satisfaction is discussed in Section Six. The last part focuses on the quality tools firms use in identifying product defects/problems, the challenges faced by firms in the TQM implementation and the percentage of local manufaturing firms' products that are exported.

4.1 Firms Characteristics

4.1.1 Multinational Firms

For the multinational firms interviewed, there were 7 Limited liability firms and 1 partnership firm. The company profile data from Table 4.1, also show that more of these firms interviewed are in Bottled water production with a total 50%. Firms from manufacturing of Aluminium and Steel products represent 37.5% and 12.5% of the firms are into Beverage and Drinks. A summuary of the firms profiles regarding number of employees shows that, 62.5% of the studied firms have above 500 employees. The remaining 37.5% of the firms have employees between 1-500.

4.1.2 Local Firms with TQM implementation

Local firms with TQM adoption interviewed include Partnership, Limited Liability and Public firms.There were 14 Partnership firms, 3 Limited Liability firms and 3 Public firms. Table 4.1 further indicate that 6 of these firms are into Aluminium and Steel manufacturing, 5 into Beverage and Drinks production, 3 into pharmaceutical products, 3 Bottled water production, 2 Rubber and Plastic manufacturing and 1 into cement production. Seventy percent of the respondent firms have more than 500 employees, 10% of the firms have between 301-400 employees, 5% of the firms have between 401-500 and the remaining 15% of the firms have employees between 1-300 employees from the data collected.

4.1.3 Local Firms without TQM Adoption

Ownership under this category also include Sole Proprietorship, Partnership, Limited Liability and Publicly owned. Twelve (12) of these firms are Sole proprietorship, 9 Partnership, 4 Limited

Liability and 2 Public firms. Further from Table 4.1, 6 of these firms are into Beverage and Drink production, 8 firms are into Bottled water production, 6 firms into Aluminium and Steel production, 6 firms into Rubber and Plastics products and 1 firm into Pharmaceutical products. Again the data collected also indicate that, 21 firms have employed between 1-500 employees while the remaining 6 firms have more than 500 employees.

Table 4.1: Types of Product

Manufacturing Product	**Multinational Firms**		**Local Firms with TQM adoption**		**Local Firms with no TQM adoption**	
	No. of Firms	Percentage	No. of Firms	Percentage	No. of Firms	Percentage
Cement	-	-	1	5	-	-
Pharmaceuticals	-	-	3	15	1	3.7
Beverages and Drinks	1	12.5	5	25	6	22.2
Aluminium and Steel Product	3	37.5	6	30	6	22.2
Rubber and Plastics	-	-	2	10	6	22.2
Sachet Water	-	-	-	-	-	-
Bottled Water	4	50	3	15	8	29.6
Total	**8**	**100%**	**20**	**100%**	**27**	**100%**

Source: Field of study, 2013.

4.1.4 ISO 9000 Certification and Quality Policy Review

The findings indicated that, only 1 Multinational firm and 7 Local firms do not belong to ISO 9000. In response to whether these firms (Multinationals and Local firms with TQM adoption)

apply ISO 9000 certification in establishing their quality systems, 20 firms indicated YES while the remaining 8 indicated otherwise. The results also indicated that, 12 Local firms with no TQM adoption have a quality control department and 15 of these firms have no quality control department. Table 4.2 indicates the review of quality policies of firms by the type of firms. It is evident from the findings that a higher percentage (75.0%) of mutinational firms review their quality policy yearly as compared to a total of 25% of the firms reviewing mothly and quarterly. For local firms with TQM adoption, 25% of them review their quality policy monthly, 15% on quarterly basis, 30% on half yearly basis and the remaining 30% yearly. Majority of firms from Local firms with no TQM adoption indicated they review quality policy every two years representing 48.1%, whereas 7.4%, 11.1% and 33.4% of the remaining firms review their quality policy quarterly, half yearly and yearly respectively.

Table 4.2: Review of Quality Policies

Frequency of Review	**Multinational Firms**		**Local Firms with TQM adoption**		**Local Firms with no TQM adoption**	
	No. of Firms	Percentage	No. of Firms	Percentage	No. of Firms	Percentage
Monthly	1	12.5%	5	25.0%	-	-
Quarterly	-	-	3	15.0%	2	7.4%
Half Yearly	1	12.5%	6	30.0%	3	11.1%
Yearly	6	75.0%	6	30.0%	9	33.4
Every Two Years	-	-	-	-	13	48.1
Total	**8**	**100%**	**20**	**100%**	**27**	**100%**

Source: Field of study, 2013.

4.2 Reliability Analysis

This part investigates the reliability of the factors used for measuring employee satisfaction, product quality and customer satisfaction in TQM implementation and the degree of TQM principles used by the firms interviewed. The coefficient values for each of the factors tested from Table 4.3 are all above 0.7. A cronbach alpha value of 0.7 and above according to Nunnally (1970) is described as reliable for factors extracted from a scale. This means that a higher value shows a more reliable generated scale. The 7 determinants of quality as shown in Table 4.3 were therefore maintained and were used for this study.

Table 4.3: RELIABILITY ANALYSIS

Critical Factors to TQM	Cronbach Alpha	Number of observations
Top Management commitment to Employee Satisfaction	.943	54
Education and Training to Employee Satisfaction	.942	54
Process Control and Improvement to Employee Satisfaction	.942	54
Customer Focus to Employee Satisfaction	.942	54
Supplier Quality Management to Employee Satisfaction	.942	54
Reward and Recognition to Employee Satisfaction	.941	54
Employee Participation	.941	54
Top Management commitment to Product Quality	.943	54
Education and Training to Product Quality	.941	54
Process Control and Improvement to Product Quality	.942	54
Customer Focus to Product Quality	.942	54
Supplier Quality Management to Product Quality	.991	54
Reward and Recognition to Product Quality	.941	54
Employee Participation to Product quality	.941	54
Top Management commitment to Customer Satisfaction	.943	54
Employee Participation to Customer Satisfaction	.941	54
Education and Training to Customer Satisfaction	.942	54
Process Control and Improvement to Customer Satisfaction	.942	54
Supplier Quality Management to Customer Satisfaction	.942	54
Reward and Recognition to Customer Satisfaction	.941	54
Customer Focus to Customer Satisfaction	.941	54
The Employee Satisfaction level in your firm	.946	54

Source: Field of study, 2013

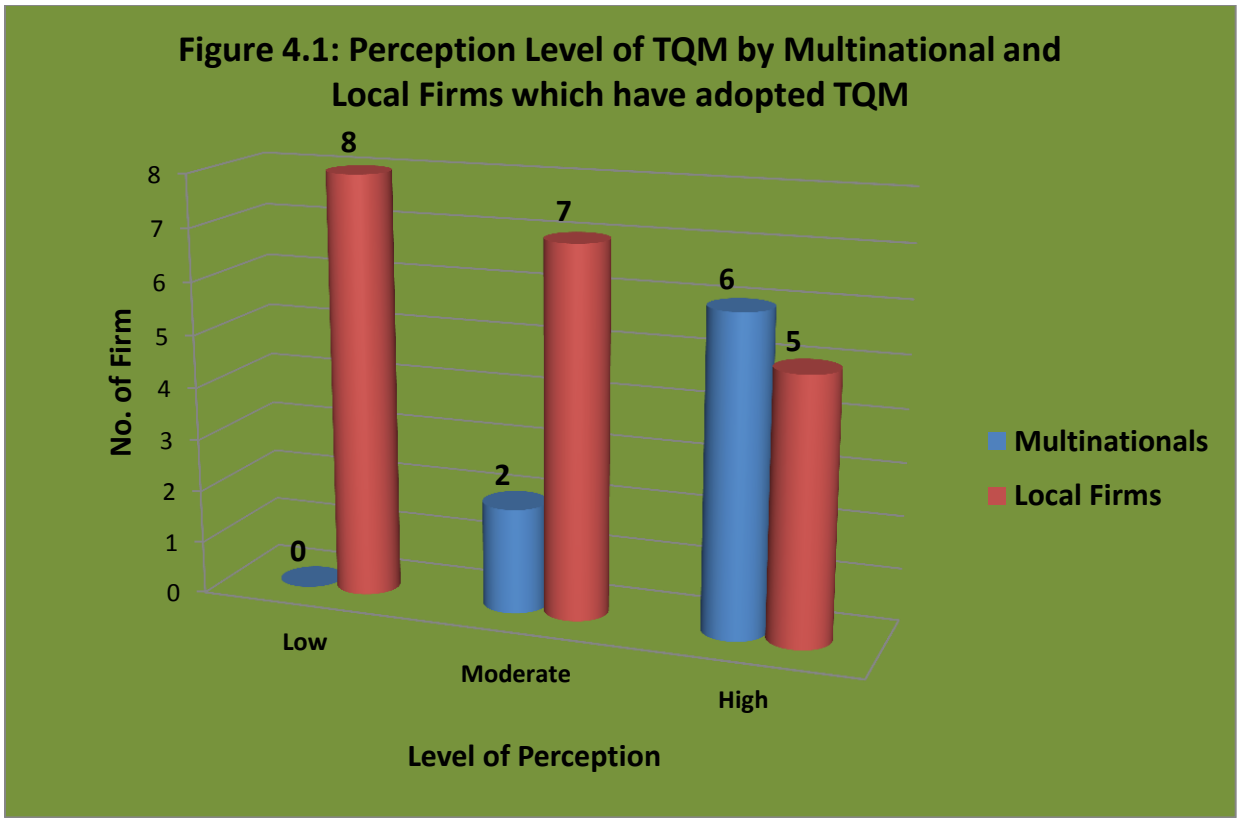
4.3 Awareness, Perception and Satisfaction Level of TQM Concept and Implementation

This part focuses on the level of awareness of Local firms which are yet to adopt the TQM concept, the level of perception of TQM concept by Multinational firms and Local firms with TQM adoption. It further revealed the satisfaction level of firms that have implemented the TQM concept. Around 77.8 % of local firms yet to adopt TQM indicated to be aware of TQM concept as compared to 22.2% indicating not to be aware of the concept. Reasons given for non-adoption and implementation are shown in Table 4.4 with 9 firms indicating that they do not have the proper structures in place, 8 firms indicated they are not familiar with the TQM concept and ISO 9000 certification and 4 firms stating that quality is ensured but not TQM approach to quality. Figure 4.1 presents a comparison of the perception level of TQM concept between multinational firms and local firms which have adopted TQM. The results suggest that, there is a low level of perception among 8 local firms with TQM adoption. However, 5 local firms indicated a high level of perception with the remaining 7 local firms indicating a moderately level of perception. In contrast, 6 Multinational firms indicated high level of perception with 2 indicating moderate perception. Sixty five percent (65%) of local manufacturing firms with TQM implementation indicated a low perception level as compared to 62.25% of multinational firms indicating high level of perception.

Table 4.4: Reasons for Non Adoption and implementation of TQM by Local firms

Response	No. of Firms	Percent	Valid Percent
Structures are not in place	9	42.9	42.9
Not familiar	8	38.1	38.1
Quality is ensured but not TQM concept	4	19.0	19.0
Total	21	100.0	100.0

Source: Field of study, 2013.



Source: Field of study, 2013.

4.4 Quality Management Principles used by firms

This section reviews the quality management principles that Multinational firms and Local manufacturing firms have adopted in the implementation of TQM. A structured interview with managers and production mangers were used to capture the role of leadership, producer-supplier quality management, process control and improvement, staff involvement, employees reward and recognition, education and training and customer focus in the implementation of TQM.

4.4.1 Multinational Firms

As reflected from the findings shown in Table 4.5, 75% of the firms "agreed" that top management actively participates in quality management activities and this was supported further by 62.5% "agreed" that top management provide encouragement for employee

involvement in quality management activities. In addition, 50% of the firms "strongly agreed" that top management discuss much quality related issues in top management meetings. Also, top management focuses more on product quality than number of units produced. The implication of these findings suggests that, the role of leadership in the implementation of TQM among multinational firms in Ghana is high.

Table 4.5: The role of leadership in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Top management actively participates in quality management activities	0	0	0	75%	25%
Top management learns quality-related concepts and skills.	0	0	12.5%	62.5%	25%
Top management encourages employee involvement in quality management activities	0	0	0	62.5%	37.5%
Top management arranges adequate resources for employee education and training	0	0	0	50%	50%
Top management discusses many quality-related issues in top management meetings	0	0	0	50%	50%
Top management focuses on product quality rather than number of output	0	0	0	50%	50%

Source: Field of study, 2013

Table 4.6 indicates the level of relationship between producers and suppliers of raw materials for production. From the study, 62.5% of the firms "strongly agreed" that their firms have established long-term relationship with suppliers and 75% also "strongly agreed" that their firms

regard quality of inputs as the most important factor in selecting suppliers. The study reveals that, more than 50% of these firms "strongly agreed" to provide feedback on the performance of their suppliers' products (raw materials).

Table 4.6: Producer-Supplier quality management in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm has established long-term cooperative relations with suppliers.	0	0	0	37.5%	62.5%
Our firm regards quality of inputs as the most important factor in selecting suppliers.	0	12.5%	0	12.5%	75%
Our firm always gives feedback on the performance of suppliers' products	0	0	0	37.5	62.5
Our firm regularly conducts supplier quality audit	0	0	0	50%	50%

Source: Field of study, 2013.

Process control and improvement in TQM implementation is relatively high with firms neatly keeping their surroundings, production equipment well maintained according to schedule and implementation of various inspections effectively. However, with the use of Deming Wheel, 12.5% of the firms "disagreed" to its use. Thirty seven and a half percent (37.5%) of the firms indicated "strongly agreed" to its use while 12.5% indicated they "agreed" to its use (refer to Table 4.7).

Table 4.7: Process control and improvement in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm is kept neat and clean at all times.	0	0	0	50%	50%
Process capability meets production requirements	0	0	0	25%	75%
Production equipment is well maintained according to the maintenance plan	0	0	0	37.5%	62.5%
Our firm implements various inspections effectively (e.g., incoming, process and final products)	0	0	0	12.5%	87.5%
Our firm uses Deming Wheel extensively for process control and improvement	0	12.5%	37.5%	12.5%	37.5%

Source: Field of Study, 2013.

Again Table 4.8 below indicates that, employee participation in TQM implementation in the multinational firms is quite high as indicated by the firms. In response to whether firms have quality circles, 50% of the respondents "agreed" or "strongly agreed" to the existence of quality circles in their firms. However, 25% of the respondents "disagreed" to the existence of quality circles in their firms.

Table 4.8: Employees Participation in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm has several QC circles (within one function)	0	25%	25%	25%	25%
Employees are actively involved in quality-related activities	0	0	0	50%	50%
Our firm implements quality improvement suggestion extensively	0	0	0	75%	25%
Most employees' suggestions are implemented after an evaluation	0	12.5%	0	62.5%	25%
Reporting work problems is encouraged in our firm	0	0	0	37.5%	62.5%

Source: Field of Study, 2013.

Although 75% of firms "agreed" that their firms improve working conditions in order to recognize employee quality management efforts, 12.5% of the firms "disagreed". Again, 25% of the firms "disagreed" that promotions are based on work quality but 50% "agreed" with 25% "strongly agreed" to the practice. 12.5% of the firms also claim that excellent suggestions are not financially rewarded with 62.5% respondents being "neutral". Overall employee reward and recognition from the study is high in the multinational firms as indicated from Table 4.9 below.

Table 4.9: Employees Reward and Recognition in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm improves working conditions in order to recognize employee quality management efforts	0	12.5%	0	75%	12.5%
Our firm has a salary promotion scheme to encourage employee participation in quality management	0	0	62.5%	12.5%	25%
Promotions are based on work quality in our firm	0	25%	0	50%	25%
Excellent suggestions are financially rewarded	0	12.5%	62.5%	0	25%
Recognition and reward activities effectively stimulate employee commitment to quality management	0	0	12.5%	62.5%	25%

Source: Field of Study, 2013.

As reflected again from the study, Table 4.10 suggests that education and training of personnel in TQM implementation is very high among the multinational firms. Although 12.5% "disagreed" to resource availability for employee education and training, 75% "agreed" to that they provide training on the use of quality tools to their employees.

Table 4.10: Education and Training in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Employees are encouraged to undertake education and training	0	12.5%	12.5%	0	75%
Resources are available for employee education and training in our firm	0	12.5%	0	62.5%	25%
Most employees in our firm are trained on how to use quality management methods (tools)	0	0	0	75%	25%
Quality awareness education is given to employees	0	0	50%	25%	25%

Source: Field of Study, 2013.

Firms' responses to customer focus in TQM implementation are quite high as shown in Table 4.11 with exceptions of 25% "disagreed" that their firms conduct customer satisfaction survey every year. 62.5% also responded "neutral" that their firms always conduct market research in order to collect suggestions for improving their products.

Table 4.11: Customer Focus in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Quality-related customer complaints are treated with top priority	0	0	0	25%	75%
Our firm conducts a customer satisfaction survey every year	0	25%	50%	12.5%	12.5%
Our firm always conducts market research in order to collect suggestions for improving our products	0	0	62.5%	12.5%	25%
Our firm has been customer focused for a the past 10 years	0	0	0	25%	75%
Our firm collects extensive complaint information from customers	0	0	0	75%	25%

Source: Field of Study, 2013.

4.4.2 Local Firms with TQM practices

This part further revealed practices by 20 local firms with TQM adoption. Leadership role in TQM implementation as compared to multinational is relatively low. Firms who "agreed" that top management actively participates in quality management activities were 25% and 20% "strongly agreed" to the practice. Responding to whether top management learns quality-related concepts and skills, 5% of the firms "strongly disagreed", 45% "disagreed", 25% "agreed" and the 15% "strongly agreed". In total, 55% of the firms "strongly disagreed" and "disagreed" to top management providing adequate resources for employee education and training whereas a total of 40% of the firms "agreed" and "strongly agreed" to such practices. Top management however focuses on product quality rather than number of units produced as "agreed" by 25% of the firms and 35% "strongly agreed" to the practice (refer to Table 4.12).

Table 4.12: The role of leadership in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Top management actively participates in quality management activities.	5%	35%	15%	25%	20%
Top management learns quality-related concepts and skills.	5%	45%	10%	25%	15%
Top management encourages employee involvement in quality management activities	5%	50%	5%	15%	25%
Top management arranges adequate resources for employee education and training	10%	45%	5%	25%	15%
Top management discusses many quality-related issues in top management meetings	10%	30%	10%	40%	10%
Top management focuses on product quality rather than yields	5%	30%	5%	25%	35%

Source: Field of study, 2013

The findings in Table 4.13 indicated that, 45% of the firms have not established long-term cooperation with their suppliers while 35% of the responding firms "agreed" to have a long-term relationship with their suppliers and 10% also "strongly agreed". The study also reveals that more than 80% "agreed" and "strongly agreed" that selection of suppliers is based on quality of raw materials supplied. Thirty five percent (35%) of the firms "agreed" with 15% firms "strongly agreed" with provision of feedback to suppliers. In contrast, 15% of the firms "strongly disagreed" and another 15% also "disagreed" to the practice. Most firms indicated their firms do not conduct suppliers audit regularly.

Table 4.13: Producer-Supplier quality management in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm has established long-term cooperative relations with suppliers.	0	45%	10%	35%	10%
Our firm regards quality of raw materials as the most important factor in selecting suppliers.	0	0	15%	50%	35%
Our firm always gives feedback on the performance of suppliers' products	15%	15%	20%	35%	15%
Our firm regularly conducts supplier quality audit	20%	40%	0	30%	10%

Source: Field of study, 2013.

Process control and improvement in TQM implementation is quite high with local firms by neatly keeping their surroundings, production equipment well maintained according to schedule and implementation of various inspections effectively. However, with the use of Deming Wheel, 45% of the firms "disagreed" and 25% "strongly disagreed" (refer to Table 4.14).

Table 4.14: Process control and improvement in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm is kept neat and clean at all times.	0	0	25%	45%	30%
Process capability meets production requirements	0	0	0	65%	35%
Production equipment is well maintained according to the maintenance plan	0	0	0	10%	90%
Our firm implements various inspections effectively (e.g., incoming, process and final products)	0	0	0	25%	75%
Our firm uses Deming Wheel extensively for process control and improvement	25%	45%	5%	15%	10%

Source: Field of Study, 2013.

Responses to employee participation in TQM implementation revealed that 20% of the firms "disagreed" to employees actively involved in quality related activities but 45% of other firms "agreed" and 15% "strongly agreed" as shown in Table 4.15. The results further indicate that, 30% of the firms "disagreed" that most employees' suggestions are not implemented after evaluation. However, 35% of the firms "agreed" and 15% "strongly agreed" that employees' suggestions are implemented after evaluation. Reporting quality problems are well encouraged with 80% of the firms "agreed" to the question asked.

Table 4.15: Employee Participation in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm has several QC circles	15%	40%	15%	20%	10%
Employees are actively involved in quality-related activities	0	20%	20%	45%	15%
Our firm implements quality improvement suggestion extensively	0	35%	15%	40%	10%
Most employees' suggestions are implemented after an evaluation	0	30%	20%	35%	15%
Reporting work problems is encouraged in our firm	0	0	0	80%	20%

Source: Field of Study, 2013.

Table 4.16 presents summary of responses from employee reward and recognition in TQM implementation. The findings indicate that 60% of the firms "disagreed" that promotions are based work quality. Also 55% indicated that excellent suggestions are not financially rewarded. However, a total of 65% of the firms "agreed" and "strongly agreed" that their firms improve working conditions to recognize employees' effort.

Table 4.16: Employees Reward and Recognition in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm improves working conditions in order to recognize employee quality management efforts	0	35%	0	45%	20%
Our firm has a salary promotion scheme to encourage employee participation in quality management	30%	45%	0	25%	0
Promotions are based on work quality in our firm	15%	60%	0	25%	0
Excellent suggestions are financially rewarded	15%	55%	0	15%	15%
Recognition and reward activities effectively stimulate employee commitment to quality management	0	30%	15%	35%	20%

Source: Field of Study, 2013.

As reflected again from the study in Table 4.17 education and training of personnel in TQM implementation is relatively low. About 55% of the firms "disagreed" that resources are available for employee education and training in their firms. However, more than 50% of the firms indicated that quality awareness education is given to employees.

Table 4.17: Education and Training in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Employees are encouraged to undertake education and training	5%	45%	15%	25%	10%
Resources are available for employee education and training in our firm	15%	55%	0	30%	0
Most employees in our firm are trained on how to use quality management methods (tools)	0	45%	15%	25%	15%
Quality awareness education is given to employees	0	40%	0	45%	15%

Source: Field of Study, 2013.

Firms' response to overall customer focus in TQM implementation implies that local manufacturing firms are not customer oriented. This is shown in Table 4.18 through a representation of 65% of respondents "disagreed" that their firms conduct a customer satisfaction survey every year. Also, 45% of the respondents "disagreed" that their firms conduct market research in order to collect suggestions for improving products. Fifty percent of the respondents in addition "disagreed" that their firms have been customer focus for the past 10 years. However, 30% of the firms "agreed" that quality related customer complaints are treated with top priority. This is also supported by 15% of the firms which "strongly agreed" that customer complaints are treated with top priority. Thirty percent of the firms "agreed" that their firms have been customer focus for the past 10 years while 20% of the firms also "agreed strongly" to such practice. In addition, 30% of the firms "agreed" or "strongly agreed" that their firms collect extensive complaints from customers with 10% also indicating "strongly agreed."

Table 4.18: Customer Focus in TQM implementation

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Quality-related customer complaints are treated with top priority	0	45%	10%	30%	15%
Our firm conducts a customer satisfaction survey every year	0	65%	0%	10%	25%
Our firm always conducts market research in order to collect suggestions for improving our products	20%	45%	5%	15%	15%
Our firm has been customer focused for a the past 10 years	0	50%	0	30%	20%
Our firm collects extensive complaint information from customers	0	45%	25%	20%	10%

Source: Field of Study, 2013.

4.5 Evaluating Critical Factors to TQM implementation.

Freidman rank test was conducted to ascertain whether or not the various factors have different impact on TQM implementation. Seven (7) factors were listed in the questionnaire and firms were asked to indicate on 7-point scale (1- very unimportant and 7-very important), the extent to which each of these factors was evident in their firms. Alpha was set at 0.05. These were ranked and the factors together with Chi-square output are shown in Tables 4.19, 4.20 and 4.21 on employee satisfactions, product quality and customer satisfaction respectively. As can been seen from the Tables (4.19, 4.20 and 4.21), the mean ranks differ and were tested to see if their differences are significant. The Chi-square test statistic for employee satisfaction with a p-value of 1.90165E-20 lower than alpha value of 0.05 revealed that the critical factors do significantly

affect TQM implementation differently (refer, Table 4.19). To find out which factors differ, we conducted a pair-wise comparison. The pair wise comparison indicated the following pairs that differ: “TMC and EP”, “PC and EP” and “CF and EP”. Hence it can be inferred that, top management commitment (TMC), process control and improvement (PC), customer focus (CF) and employee participation (EP) are the most critical factors in that order to employee satisfaction. Again the output from Table 4.20 shows that, the Chi-square test statistics for product quality of 90.224 suggest a significant level of 2.72257E-17. The result indicates that, the critical factors contribute significantly to TQM implementation differently. The pair-wise comparison also revealed that, “TMC and ET”, “TMC and SQM”, “TMC and RR”, “TMC and EP”, “PC and SQM”, “PC and EP” and “CF and EP” differ significantly. Product quality is therefore significantly affected by all the seven factors in TQM implementation. Finally, the test statistics output in Table 4.21 also shows significant level towards customer satisfaction with a p-value (7.12718E-18) lower than the alpha value of 0.05. This again suggests that, TQM implementation is affected differently by the critical factors. The pair-wise comparison for customer satisfaction indicated that, “TMC and ET”, “TMC and SQM”, “TMC and RR”, “TMC and EP”, “PC and EP” and “CF and EP” differ significantly. These factors also are most significant towards customer satisfaction.

This indicates that the seven predictor (top management commitment, education and training, process control and improvement, customer focus, supplier quality management, employee participation and reward and recognition) variables impact on TQM implementation differently.

Table 4.19: Factors to Employee Satisfaction

Factors	Mean Rank
Top Management commitment to Employee Satisfaction	4.36
Education and Training to Employee Satisfaction	3.96
Process Control and Improvement to Employee Satisfaction	4.09
Customer Focus to Employee Satisfaction	4.32
Supplier Quality Management to Employee Satisfaction	3.89
Reward and Recognition to Employee Satisfaction	3.93
Employee Participation	3.45

Chi-square for Friedman's rank test for multiple comparisons

Chi-Square (X^2)Statistics	Degrees of Freedom (7-1)	P-Value
105.365	6	1.90165E-20

Source: Field of study, 2013.

Table 4.20: Factors to Product Quality

Factors	Mean Rank
Top Management commitment to Product Quality	4.55
Education and Training to Product Quality	3.90
Process Control and Improvement to Product Quality	4.29
Customer Focus to Product Quality	4.21
Supplier Quality Management to Product Quality	3.76
Reward and Recognition to Product Quality	3.89
Employee Participation to Product quality	3.41

Chi-square for Friedman's rank test for multiple comparisons

Chi-Square (X^2)Statistics	Degrees of Freedom (7-1)	P-Value
90.224	6	2.72257E-18

Source: Field of study, 2013.

Table 4.21: Factors to Customer Satisfaction

Factors	Mean Rank
Top Management commitment to Customer Satisfaction	4.65
Employee Participation to Customer Satisfaction	3.81
Education and Training to Customer Satisfaction	4.31
Process Control and Improvement to Customer Satisfaction	4.27
Supplier Quality Management to Customer Satisfaction	3.82
Reward and Recognition to Customer Satisfaction	3.78
Customer Focus to Customer Satisfaction	3.35

Chi-square for the Friedman's rank test for multiple comparisons for Product Quality

Chi-Square (X^2)Statistics	Degrees of Freedom (7-1)	P-Value
93.024	6	7.12718E-18

Source: Field of study, 2013.

4.6 Overall Performance of various firms interviewed

Descriptive statistics were used to determine the overall performance based on best practices. The overall mean satisfaction (6.28) of employee satisfaction on business performance for multinational firms is the highest with a standard deviation of 0.55 as compared to Local firms with TQM adoption with 5.71 mean score and standard deviation of 1.22. Local firms with no TQM adoption have the lowest mean score of 4.28 and a standard deviation of 1.29 as shown in Table 4.22. The overall response on product quality suggests again that multinational firms recorded the highest mean score on overall business performance of 3.92 (refer to Table 4.23). Finally, 275 customers were used to rate their satisfaction level on product usage, quality of product, reliability and response to complaints. The finding from Table 4.24 implies that customers were most satisfied with product from multinational firms with a mean of 5.95 as

compared to 4.98 and 4.4568 mean for local firms that have implemented TQM and local firms without TQM implementation respectively.

Table 4.22: Comparing Employee satisfaction among Manufacturing Firms

Categories of Customers	Sample	Maximum Score	Mean Satisfaction score	Std. Deviation
Multinational Firms with TQM Implementation	100	7	6.28	0.55
Local Firms with TQM implementation	100	7	5.71	1.22
Local Firms with no TQM implementation	100	6	4.28	1.29
Total	300			

Source: Field of study, 2013.

Table 4.23: Comparing Product quality among Manufacturing Firms

Categories of Firms	Sample	Maximum Score	Mean Satisfaction score	Std. Deviation
Multinational Firms with TQM Implementation	40	4	3.92	0.24
Local Firms with TQM implementation	100	4	2.9	0.50
Local Firms with no TQM implementation	135	4	2.46	0.74
Total	275			

Source: Field of study, 2013.

Table 4.24: Comparing Customer satisfaction among Manufacturing Firms

Categories of Customers for each Firm	Sample	Maximum Score	Mean Statistic	Std. Deviation
Multinational Firms with TQM Implementation	40	6.2	5.95	0.485
Local Firms with TQM implementation	100	6.2	4.98	0.5806
Local Firms with no TQM implementation	135	5.4	4.568	0.958
Total	275			

Source: Field of study, 2013.

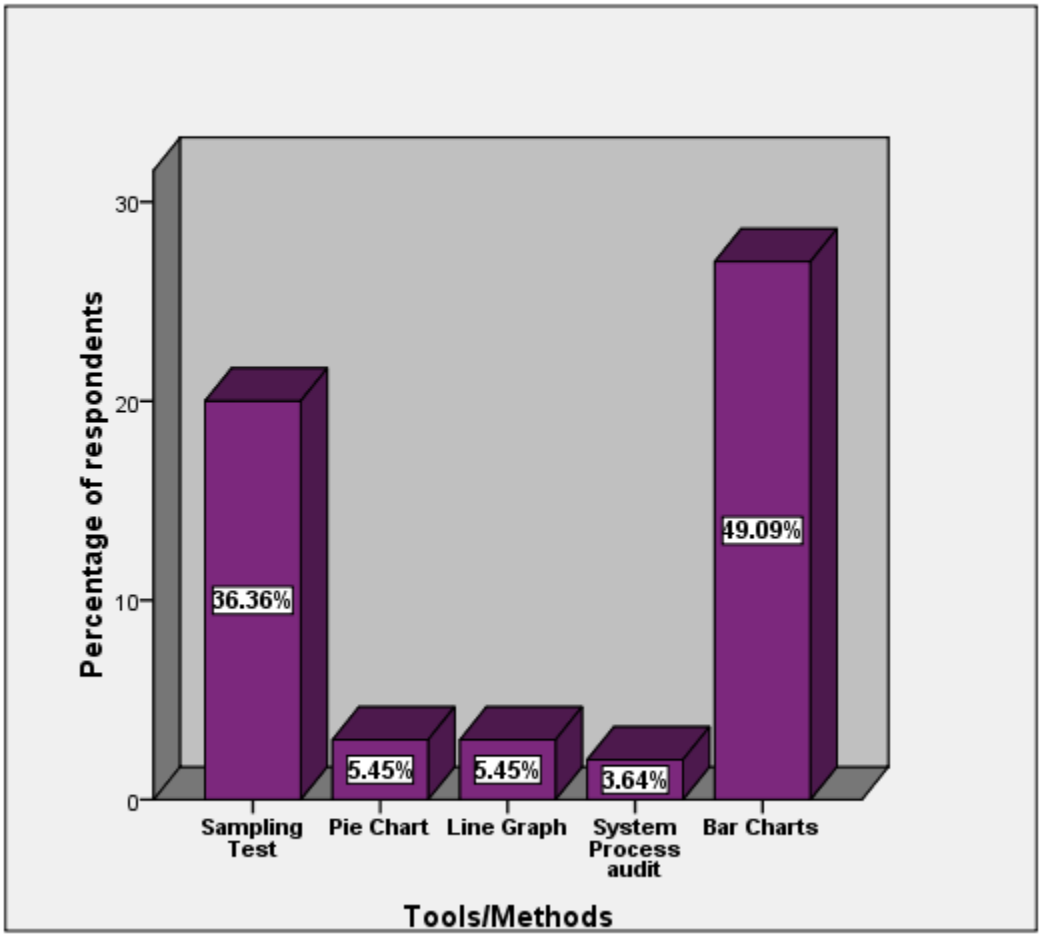
4.7 Quality Tools and Challenges of TQM implementation

From the data collected, 85.5% of the firms interviewed use the various quality tools. Majority (23.6%) of firms indicated they use Flow charts. Eleven firms, representing 20%, use Statistical Control Charts to identify products defect. The result further indicates that 16.4% of the firms use Check Sheet in identifying products defects. Again, 3 firms, representing 5.5%, indicated to be using Pareto Charts and Scatter diagram. Only 1 firm however, indicated the use of Fish Bone diagram for detecting quality problems. Out of the 55 firms interviewed, 8 firms did not response to these questions. We also wanted to identify other tools these firms use in addition to the seven quality tools. From the findings, bar charts represent the most common tool used by these firms, with a percentage of 49%, followed by acceptance sampling with 36.4% as indicated in Figure 4.2. Some firms also use Pie charts, Line graph and System Process Audit.

Finally, the implementation of TQM concept is coupled with challenges. Firms interviewed indicated several challenges and these are shown in Table 4.25. These include communication of quality policy to staff, Lack of understanding of TQM concept, inadequate resource to train staff,

Raw materials from suppliers, Unwillingness of staff to participate, Machine maintenance, cost of implementation, continuity of process by management and employees and training and education.

Figure 4.2: Other tools/methods used by firm to identify product defect/problem



Source: Field of study, 2013.

Table 4.25: Challenges faced by firms in implementing Total Quality Management

Challenges	Frequency	Percent	Valid Percent
Communication of Quality policy to staff	5	9.1	9.1
Do not understand the concept of TQM	5	9.1	9.1
Inadequate resource to train staffs	4	7.3	7.3
Quality with raw materials from suppliers	8	14.5	14.5
Unwillingness of staff participation during production	4	7.3	7.3
Machine Maintenance	4	7.3	7.3
Cost of ensuring quality is expensive	5	9.1	9.1
Management do not meet regularly in discussing quality issues	4	7.3	7.3
Employee participation because of level of education	5	9.1	9.1
Continuity with the process by management and employees	4	7.3	7.3
Training and Education of staff	7	12.7	12.7
Total	55	100.0	100.0

Source: Field of Study, 2013

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

The implication of the analysis conducted from the 55 manufacturing firms in Ghana is discussed in this chapter. The findings are based on the evidence of the responses from the multinational firms, local firms with TQM adoption and local firms without TQM adoption. Specifically, the chapter examines the results on quality systems, policies and practices of the studied firms. How a manufacturing firm's characteristics influence the level of awareness and the level of implementing the TQM concept and the quality management practices within each firm. The significant contribution of the critical factors on firms' performance is also examined in this chapter. In addition, it highlights the various quality tools these firms use and the various challenges facing Ghanaian manufacturing firms in implementing the TQM concept.

5.2 Quality systems, procedures and ISO 9000 certification

Evidence from the analysis on quality systems among firms indicated that, multinational firms review their quality policies more often than the others. These quality policies were developed to meet ISO 9000 certification. One can therefore conclude that multinational firms in Ghana seem to appreciate the fact that quality is dynamic when compared to indigenous Ghanaian firms. All the eight (8) multinational firms also indicated to have a separate quality control department that exercises some degree of autonomy in their operations. The results also revealed that, out of the 20 local manufacturing firms with TQM adoption, 7 do not apply ISO 9000 certification in developing their quality guidelines. It was also found out that, 15 local firms without TQM adoption have no quality control department that ensures quality product in the production

process. These firms have not formalized or documented the processes or procedures for achieving quality products. The implication here is that, most Ghanaian manufacturing firms do not see it as mandatory to have a quality control department before or after years of operations. Again, the quality policies of these firms were very poor with some firms reviewing their policies every two years. However, 6 local firms with TQM adoption indicated that they review their quality policies half yearly with another 6 local firms with TQM adoption also indicating yearly review. The overall review of quality policies and ISO 9000 certification shows that, multinational firms in Ghana are far advanced as compared to local Ghanaian manufacturing firms. This is due to the fact that they are more involved in international trade where manufactured products are mostly exported into other foreign markets. Secondly, the level of leadership commitment in ensuring the overall quality measures in the production of products that are ISO certified, meet customers' specifications and are cleared as defect-free.

5.3 Firms Characteristics and TQM Implementation

The evidence from this study leads to the conclusion that, other factors such as firm characteristics, which include firms' ownership, composition of top management and level of operations, have a significant impact in the implementation of TQM. Firms ownership used in this study include sole proprietorship, partnership, publicly owned firms and limited liability firms. Compositions of top management were selected based on skills, expertise, knowledge and experience in quality related activities mostly in the multinational firms. Firm's levels of operations include facility layout, process design, technology usage and production capacity.

The above evidence is supported by the following responses from the firms. The study revealed that, 21 local firms without TQM adoption indicated they are not aware of the Total Quality

Management concept. However, those who indicated to be aware also gave the following reasons for non-adoption: they do not have the proper structures in place and that they are not familiar with the TQM concept and ISO certification. Some managers also indicated they have had no training and education on the TQM concept and ISO 9000 standards. It is interesting to note that most of these firms' products have a Food and Drug Board approval with serial numbers even though they do not meet ISO 9000 standards. Some of these products include sachet water, drinks and beverages, pharmaceutical products and plastics. These findings support earlier studies reviewed from literature by Mensah et al. (2012) that, TQM concept among indigenous Ghanaian firms is very low. The analysis again revealed that, 5 local firms who are aware and have implemented the TQM concept indicated a high level of satisfaction. The analysis also revealed high level of satisfaction of TQM implementation among multinational firms in this study. The driving forces for most of these multinational firms are generally, the need to stay competitive in a hypercompetitive environment, the desire to achieve customer satisfaction and continuously improve to meet international regulatory standards. These reasons or driving forces are similar to those identified by previous researchers. This similar to earlier findings by Mellahi and Eyuboglu (2001) on how firms in Turkey decided to implement TQM and other quality management practices as a result of volatile and uncertain operating environment they found themselves after the period of trade liberalization in the 1980s. Turker (2008) also found that severe foreign competition and difficulties in achieving customer satisfaction by local firms coupled with the entry into the European Common Market in 1989 had been important drives. It is also worth noting that, most top management in the multinational firms are expatriates which to a large extent helps in driving the success of TQM implementation.

5.4 Quality Management practices among manufacturing firms in Ghana

The findings from the study revealed the extent to which TQM concept is practiced. The study revealed the role of leadership, producer-supplier quality management, process control and improvement, staff involvement, employees reward and recognition, education and training and customer focus in the implementation of TQM among multinational firms and local firms with TQM adoption. As reflected from the analysis, the role of leadership among multinational firms in Ghana is high. The implication is that top management is very much committed to the implementation of TQM through providing staff with resources, inspiring, empowering and recognition of employees. However, leadership role among local firms with TQM adoption is quiet low. Apart from 40% who "agreed" and "strongly agreed" that "Top management discusses many quality-related issues in top management meetings" and "Top management focuses on product quality rather than yields", there was a low participation in quality related activities and encouraging employees involvement in quality related activities. Local firms with TQM adoption should therefore put emphasize on teamwork, creation and sustaining clear visions, goals and target and provision of quality services since respondents were not satisfied with the role leadership plays. Studies have shown that, role of leadership is very crucial in the successful implementation of TQM and organization performance (Chrusciel and Field, 2003; Barozyk, 2000).

Developing partnership with suppliers is one of the major TQM implementation practices. External cooperation between a firm and its suppliers has merit in the just-in time purchasing systems. Working collaboratively with suppliers on a long-term basis is truly beneficial. The findings from the study indicated that, producer-supplier quality management practices among multinational firms were better than that of local firms. Most local firms do not regularly perform

supplier quality audit and only few have established long term relationship with their suppliers. However, 15 local firms strongly agreed and agreed that quality of raw materials were the most important factor in selecting suppliers.

The study also revealed that, the level of employee participation and reward of employees in the implementation of TQM was relatively high among multinational firms than local firms with TQM adoption. Employee participation to a very large extent influences the successful implementation of TQM. For most multinational firms, motivation of employees to participate and support quality initiative was dominant in their responses which have resulted in high product quality and reduction of defect. This result supports earlier study by Barker and Cagwin (2000). They concluded that employee participation leads to significant savings by reducing defects and the need for rework. Deming also emphasized that employees should be encouraged to make suggestions and take a relatively high degree of responsibility for overall performance. Many other writers have also highlighted the importance and criticality of rewards and recognitions in the quality improvement process (Rao et al., 1999; Dayton, 2001; Li et al., 2001; Everett, 2002). Russell and Taylor (2011) further explain that, employees' satisfaction is increased when achievement is reinforced through rewards and recognition

It is interesting to note that, most local firms with TQM adoption ensures a high process control and improvement practice in their production process. About 90% of these firms were highly involved in ensuring that production units are "kept neat and clean at all times", "Process capability meets production requirements", "Production equipment is well maintained according to the maintenance plan" and "implementing various inspections effectively (e.g., incoming, process and final products)". These practices were similar to that of multinational firms in Ghana. However, the use of Deming's wheel was relatively higher among multinational firms

than local firms with TQM adoption. The findings also revealed the various tools and techniques that firms in Ghana (both multinational and local firms) use in process control and improvement. These include process flow charts, Pareto chart, statistical control charts, fish bone diagram, check sheet, scatter diagram and histogram. These tools and techniques identified were consistent with the seven quality control tools in literature for ensuring quality improvement (Tari, 2005).

Abdullah et. al, (2008) reiterated that, many research results revealed that training and education is one of the most important elements (factors) in a successful implementation of quality improvement. The analysis from this study however suggests that, local manufacturing firms with TQM adoption have a low level of approach to employees' education and training. The findings indicate that employees are not encouraged to undertake education and training, resources are not adequate for employee education and training and most employees are not trained on how to use quality management methods (tools). Critical analysis and observation suggest that, training and education have more or less been limited to the general induction, safety, environment and health trainings and job specific training. Training on quality issues are dealt with to some extent but the amount and frequency of training cannot be considered to match the level of training advocated under TQM. Almost all the indigenous Ghanaian firms relied on the few sensitization training programmes organized by regulatory bodies such as Ghana Standard Authority (GSA) and Food and Drugs Board (FDB) on quality awareness. This practice however, is the reverse among multinational firms which have well-structured quality programmes for management and employees.

Customer focus practices identified from the literature include treating customer complaints with top priority and firms always conducting market research in order to collect suggestions from

customers. The results indicated that, most of the local firms with TQM adoption interviewed were not involved in the above practices. This shows that most firms in the developing world or economy, to a lesser degree, involve their customers in the production process as advocated by Deming (1986). The analysis however shows that, multinational firms are more customer focus than the indigenous Ghanaian firms. The study further revealed that about 80% of the multinational firms were involved in conducting market research on their product performance and on how best to improve customer satisfaction. These firms (multinational firms) concluded that responding to customer complaints was the firm's top most priority. It is important to note that, the most dominant critical factors affecting the implementation of TQM among Ghanaian manufacturing firms include leadership role, employee training and education, employee participation, reward and recognition, customer focus and supplier-producer quality management. Process control and improvement was however found to be one factor most firms apply in the quality management activities. In general, TQM practices among indigenous Ghanaian firms are relatively low as compared to multinational firms in Ghana. These were attributed to the level of support, in terms of resources, the multinational firms receive from their parent companies.

5.5 Performance rating among manufacturing firms

The study used descriptive statistics to analyze the overall performance of the implementation of quality related activities. The performances were limited to employee satisfaction, product quality and customer satisfaction. Ratings of product quality were limited to the production managers and quality control managers. Customer satisfaction and employee satisfaction level were also rated by customers and employees of the selected firms for this study. From the analysis, multinational firms were rated best in overall employee satisfaction with a mean value

of 6.67 and a standard deviation of 0.59. Local firms with TQM adoption follows with a mean score of 5.71 and standard deviation of 1.22 were as local firm with little or no adoption with TQM had the lowest mean score and a standard deviation of 4.31 and 1.41 respectively. Performance with respect to product quality was also rated on the basis of performance of primary products in the market. The study again suggests that, multinational firms were rated the best in the industry with respect to product performance followed by local firms with TQM adoption were as local firms with TQM adoption had the least mean score. The multinational firms had mean score of 3.92 and standard deviation of 0.24, local firms with TQM adoption had a mean score of 2.9 with a standard deviation of 0.54 and local without TQM adoption had a mean score of 2.46 and a standard deviation of .74. Multinational firms were again rated the highest performance with respect to customer satisfaction ahead of local firm with TQM adoption and local firms without TQM. The analysis indicated a mean score of 6.09 with a standard deviation of 0.64 for multinational firms, 5.85 mean score with a standard deviation of 1.21 for local firms with TQM adoption and a mean score of 5.0 and a standard deviation of 2.38 for local firms without TQM adoption. The overall analysis on performance supports the need for indigenous Ghanaian firms to improve upon their quality management practices. As concluded by most studies, improvement in quality will lead to an increase in the level of satisfaction of customers, and consequently results in greater loyalty (Deming, 1986; Bergman and Klefjo, 2007; Sandholm, 2000). In addition employee level of satisfaction is affected through quality management. This was also supported by Shea and Gobeli (1995). They found out that the implementation of TQM by small businesses improved the capabilities of employees, increased employee performance and retention, reduced employee turnover, improved employee morale and an overall employee loyalty to the company. It is therefore clear that, most

multinational firms are achieving customer satisfaction, high product quality and employee satisfaction as a result of the level of implementation in quality management activities. From the results in this study, one can conclude that, Ghanaian manufacturing firms can achieve high customer satisfaction and customer loyalty through the implementation of TQM. In addition high competitive advantage is achievable for Ghanaian manufacturing firms by embarking on implementing TQM concept.

From literature, several factors were also identified as critical in the implementation of Total Quality Management. This study however, adopted seven of these critical factors and how each differently contributes to the implementation of TQM. These are: Top Management Commitment, Education and Training, Process Control and Improvement, Supplier Quality Management, Reward and Recognition and Employee Participation. These were further used to test performance with respect to employee satisfaction, product quality and customer satisfaction. Friedman rank test for multiple comparisons was used to test the research hypothesis that these factors do contribute differently to firm performance in relation to the firms used for this study. The results from the analysis concluded that, these factors contribute differently to firm performance. The p-values for the test statistics had values (1.90165E-20, 7.12718E-18 and 2.72257E-17) less than 0.05 alpha levels for employee satisfaction, product quality and customer satisfaction. This supports earlier study by Curkoviv et al. (2000). They purported that, the implementation of the critical factors or elements or principles of TQM directly affect the financial measures such as pre-tax ROA, after-tax ROA, ROI, market share and indirectly affect the same variables through the improvement of the dimensions of quality such as reliability, durability, responsiveness to customers. Significantly, these factors contribute to the success of TQM implementation.

Lastly from the analysis, the dominant challenges faced by firms in the implementation of TQM are listed below.

i. Communication of quality policy to staff
ii. Lack of understanding the concept of TQM
iii. Inadequate resources to train staffs
iv. Quality of raw materials from suppliers
v. Machine maintenance culture
vi. Unwillingness of staff participation during production
vii. Cost of ensuring quality is expensive
viii. Management do not meet regularly in discussing quality issues
ix. Employee participation because of level of education
x. Continuity with the process by management and employees
xi. Training and Education of staff

These challenges were however not different from barriers to TQM implementation by Muller et. al (2012). These challenges have resulted in a lot failures in the implementation of TQM among firms.

CHAPTER SIX

TQM MODEL FOR IMPLEMENTATION

6.1 Introduction

TQM model for implementation among manufacturing firms is proposed in this chapter. The proposed model for TQM implementation has four stages (refer, Figure 6.1). Each stage has been carefully designed to include the Critical Factors (CF) for TQM implementation. The various stages must be linked together in attaining a successful implementation of the TQM concept.

6.2 STAGE 1: Drive to Preparation and awareness of TQM

This stage is concerned with thorough knowledge of what can and should be expected from the introduction of TQM and its implementation. At this stage, attention is required first at top management's commitment for quality initiatives in all aspects through vision and plan statement which describe how a company wants to be seen in its operations. In addition, total employee participation in the quality design is very necessary in achieving the drive, awareness and preparation of TQM concept. Management should also ensure that it create a working environment for quality management.

6.3 STAGE 2: Developing and Focus on Customer Needs

Stage 2 requires top management to develop and focus on the needs of customers. The key to quality management is maintaining close relationships with customers in order to determine fully customer needs as well as to receive feedback on the extent to which those needs are being met. Deming advocated that, *"the customer is the most important part of the production line. Quality*

should therefore aim at the needs of the customer, present and future". The insights gained from a feasibility study and feedback from customers can clearly help the firm to improve quality of design, quality of conformance and quality of performance.

6.4 STAGE 3: Standardize, Improve and Review

This stage standardizes the plan implementation of TQM programmes. This involves clearly distinguishing between quality systems, problem solving process, and standardizing a structure with cross functional teams. It is also important at this stage to standardize and review procedure with which suppliers are selected. The selection procedure must standardize practices in relation to quality and reliability of raw materials or components for manufacturing of products. Communicating the firms total quality policies, programmes and principles to employees and suppliers at this stage is very vital. Employees and suppliers must be led to appreciate the benefits to be gained by using TQM. For this purpose firms can publish alternative brochures and even encourage their suppliers to join them in specific quality improvement and quality management programmes. This entire programme is based on the principles and benefits from good supplier-producer relationship.

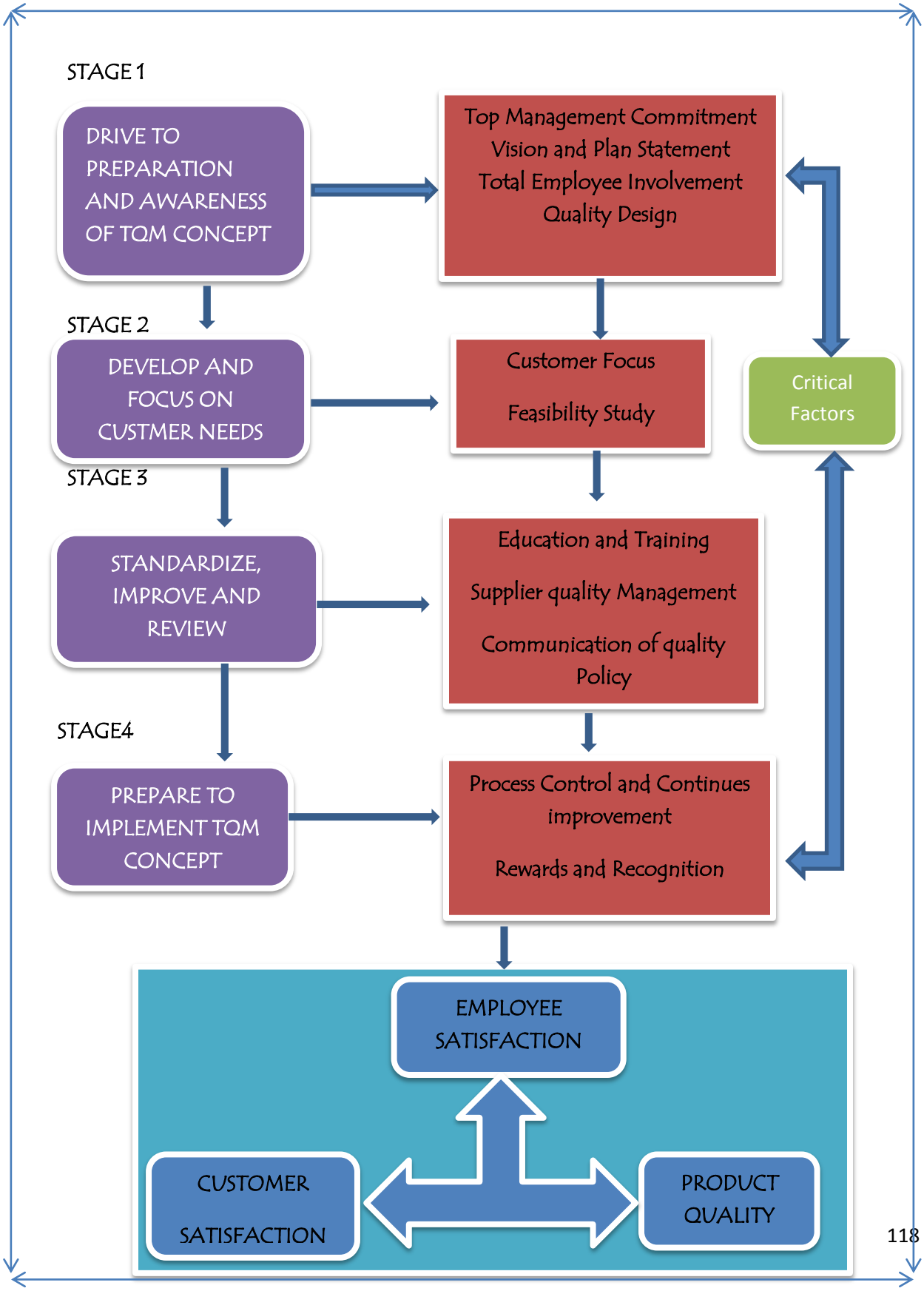
For continuous quality improvement in production and quality management practices, education and training of employees are key determinants. Top management should ensure that adequate resources and training are made available at all times. Quality education and training include quality awareness education and basic quality management methods, such as statistical process control, problem solving methods, basic tools and techniques.

6.5 STAGE 4: Prepare to implement TQM concept

The last stage of the model is the implementation of the TQM concept. The implementation stage should involve everyone in the firm. Top management and all employees must be responsible at this stage to ensure the success of the programme. At the implementation stage, process control and continuous improvement allow individuals to be involved in the day-to-day operations to change and improve processes and work flows according to the set standards. Process management focuses on managing the manufacturing process so that it operates as expected, without breakdowns, missing materials, fixtures and tools. One aspect of process management is equipment maintenance. This ensures that variation is kept within acceptable bounds, keeping the manufacturing process running smoothly. On the other hand, the process control should employ variety of techniques, such as the seven quality control tools and others like PDCA (Plan, Do, Check, Act). Management should reward and recognize employees who make positive contributions to the success of TQM concept. Rewards and recognition can be in many forms but it is always better to develop new ideas to suit the local situation for recognition. The integration of efforts at the various stages and levels and using the above critical factors of TQM implementation is key to the success of the concept. They form the foundation and pillars of an implementation strategy plan in ensuring TQM culture.

By using the above model, it is hoped that manufacturing firms shall be able to implement TQM in a systematic manner. In the long run, the positive effect of using this model will lead to firm performance with respect to Employee Satisfaction (ES), Product Quality (QP) and Customer Satisfaction (CS).

Figure 6.1: PROPOSED TQM IMPLEMENTATION MODEL FOR IMPLEMENATION IN THE MANUFACTURING FIRMS



CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATION

7.0 Introduction

This chapter provides a summary of the findings from the analysis of the data, the researcher's conclusions on the extent to which TQM is practiced among manufacturing firms in Ghana and the recommendations in respect to how Ghanaian manufacturing firms can achieve employee satisfaction, high product quality and customer satisfaction.

7.1 Summary

The objective of the study was to determine the extent to which TQM is practiced among manufacturing firms Ghana. Out of the 60 questionnaire administered, 55 were retrieved for the analysis from 55 manufacturing firms. These comprised 8 multinational firms, 20 local firms with TQM adoption and 27 local firms without TQM adoption. The overall review of quality policies and ISO 9000 certification shows that, Multinational firms in Ghana are far advanced as compared to Ghanaian manufacturing firms. This due to the fact that they are more involved in international trade, the need to stay competitive in a hypercompetitive environment, level of management involvement and the desire to achieve customer satisfaction. These require them to produce products that are ISO certified, meet customers' specifications and are cleared as defect-free.

The study adopted seven critical factors in the implementation of TQM which were used to determine the extent of adherence among the different categories of firms used. These include top management commitment, producer-supplier quality management, process control and improvement, staff involvement, employees reward and recognition, education and training and

customer focus. These factors identified contribute differently to firms' performance as revealed in this study. Results from the analysis further shows that, the most dominant critical factors affecting the implementation of TQM among Ghanaian manufacturing firms are top management commitment, employee training and education, employee participation, reward and recognition, customer focus and supplier-producer quality management. Process control and improvement was however found to be one factor most firms are doing well in it application in quality management activities. In general, TQM practices among indigenous Ghanaian firms are relatively low as compared to multinational firms in Ghana considering the level of support they receive from international headquarters and resource availability. The above evidence concludes that, firm characteristics such as ownership, composition of top management and level of operations and production among Multinational manufacturing firms and Local manufacturing firms have a significant impact in the implementation of TQM.

Finally, results from the findings suggest that, firms can achieve high employee satisfaction, high customer satisfaction and high product quality through the implementation of the TQM concept. Therefore manufacturing firms in Ghana can achieve the above by ensuring that maximum efforts and adequate resources are made available in the implementation of TQM. Key challenges in the implementation of TQM as revealed in the study include;

i. Communication of quality policy to staff
ii. Lack of understanding the concept of TQM
iii. Inadequate resources to train staff
iv. Quality of raw materials from suppliers
v. Machine maintenance culture
vi. Unwillingness of staff participation during production

vii. Cost of ensuring quality is expensive

viii. Management do not meet regularly in discussing quality issues

ix. Employee participation because of level of education

x. Continuity with the process by management and employees

xi. Training and Education of staff

7.2 Conclusion

This study identified a number of significant findings on the extent to which TQM is been practiced in Ghana. Empirical evidence from the study suggests that, TQM practice in the application of the seven critical factors towards quality in Ghana is very low especially among indigenous Ghanaian manufacturing firms and cannot be describe as a total approach. The study shows a low level of commitment in the application of these factors regularly. Regarding the extent of application of quality management, differences were observed between multinational firms with some level of expatriate management and indigenous Ghanaian firms owned and solely managed by Ghanaians with the former performing better. The differences were attributed to the level of top management commitment, employee participation, education and training, reward and recognition, supplier-producer quality management, process control and improvement and customer focus.

Building on previous studies in this area, this study presents new results evidencing the importance of the critical factors in quality improvement and organization performance, namely employee satisfaction, product quality and customer satisfaction. Significantly, Friedman rank test was used to determine how each of the factors contributes differently to firm performance. Top management commitment was identified as the major contributor (highest mean rank) in the successful implementation of TQM followed by process control and improvement, customer

focus, education and training, reward and recognition, supplier quality management and employee participation. This study also conclude from the analysis that, firms characteristics such as ownership, composition of top management and level of operations and production among Multinational manufacturing firms and Local manufacturing firms have a significant impact in the implementation of TQM. Ghanaian firms should take a further look at top management commitment, employee participation, education and training, reward and recognition, customer focus and supplier-producer quality management as they were identified as the critical factors affecting the implementation of TQM.

Although the study identified several contributions to the field of study, the limitation were however the mix categories of manufacturing companies with different products output, the cross-sectional nature of the data, the sample of study was limited to Accra-Team metropolis and other critical factors may have not been considered. Given these limitations future research might be carried out in three directions. First, concentration could be centered on a specific manufacturing sector with a common product base in order to make comparisons in TQM practices. Secondly, a longitudinal research would complement this work to support these findings on a longitudinal basis. Lastly, future studies could look into the possible inclusion of several other critical factors such as communication, quality culture and teamwork in relation to TQM implementation.

7.3 Recommendations

There has been a growing need for firms to improve upon the quality of product to meet customer satisfaction. Total Quality Management is therefore one of the concept by which these objectives could be ascertained.

The following recommendations based on the study have been suggested by the authors to the various stakeholders responsible for, interested in and affected by product and service quality.

The study identifies that, generally quality policies and procedures adopted by most local firms were not consistent with ISO 9000 quality policy guidelines. Some firms identified have not formalized or documented their quality policies but with just a "word of mouth". This challenge often results in affecting the quality culture in the entire organization.

The study therefore advocates that, efforts should be made by the top management of the manufacturing firms to create a quality and TQM culture throughout the entire organization. This can be achieved by changing the quality strategies and policies of the organization. There should be a quality policy that stipulates the quality vision and provides strategies to achieve this vision. Also, the policies and strategies should be able to motivate and encourage the subordinates or employees to be committed to the change process. Properly documented quality management policy manuals provide control system in the entire production chain and also create quality awareness in the entire organization. This manual in the long run, determines the processes needed for quality management system to ensure effective operation and control within the production process.

The study revealed that, top management commitment, education and training and supplier-producer relation were the most challenging critical factors in the implementation of TQM. A predominant issue in quality management literature is that a strong commitment from top management is vital. Top management must therefore establish quality policy, establishing and deploying quality goal, providing the needed resources, providing problem-oriented training and stimulating improvement. Education and training have also been found to be most important elements in a successful implementation of TQM. There is therefore the need to equip employees

with the needed skills and knowledge to handle their various roles during and after the change process, their anxiety of learning and changing would be reduced. It is therefore necessary that the firms should create an internal quality awareness programme aimed at training and educating employees within. The training programme should aim at creating the quality awareness in the entire firm. Equipping all employees with the requisite skills and knowledge as well as influencing the attitude, values and behaviors of people is essential. Considering the low level of quality management in Ghana, a training programme on total quality management from the awareness creation stage to implementation stage will go a long way to address the current level of quality and also act as an impetus to the quest for world-class quality by Ghana in general and Ghanaian manufacturing firms in particular. The firm can also directly contact external bodies such as Ghana Standard Authority (GSA) and Food and Drug Authority (FDA) who are the statutory bodies responsible for standardization, assurance of quality, safety and efficacy of products and services in Ghana to provide training for all employees. Considering the low level of quality awareness both on the part of Ghanaian firms and customers, we recommend that, the statutory bodies should lay more emphasize on the sensitization, training and educational aspects of their activities. A massive sensitization programme is a prudent means of commencing the journey towards world-class quality of products and services. This study will therefore provide a platform for the FDA and GSA to identify and facilitate quality training programmes for manufacturing firms in the country. This training must emphasis on ISO 9000 specification in developing quality policy and also the total approach to total quality management concept. There is also the need for the FDA and GSA to provide constant leadership training on the concept of TQM among firms in Ghana, since leadership commitment affects the implementation of TQM. Also regular monitoring schedules for these firms are very essential.

Other stakeholders that have a major role to play in the nation's quest for higher quality are Association of Ghana Industries (AGI), National Board for Small Scale Industries (NBSSI) and Ghana Export Promotion Council (GEPC). The study recommends that activities of these bodies should involve quality management training and educational programmes.

In a system where government assistance and assistance from donor agencies are always essential and sought for, the government has a substantial role to play in promoting quality management in Ghana through the various agencies. On the issue of supplier-producer relationship, we advocate that firms must establish supply chain partnerships to motivate suppliers to provide materials needed to meet customer expectation. Regular supplier evaluations help organizations to share information and improve mutual understanding.

Lastly, the proposed TQM model in the previous chapter (refer, Figure 6.1) is recommended to be carefully considered in designing a TQM program. Using these critical factors (MC, CF, PCCI, EP, ET, RR and SQM) in TQM implementation results in employee satisfaction, product quality and customer satisfaction. In the long run, the positive effects of these results are translated into high organizational performance. The performance among other things will include

i. Profitability
ii. Competitive advantage over other firms
iii. Low cost of production
iv. Good Maintenance Culture
v. Product quality and design
vi. Increase in Productivity
vii. Employee Satisfaction

viii. Customer Satisfaction

Thus, for TQM to be well implemented, these values must be communicated at all levels within the organization (strategic level, tactical level and operational level).

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APPENDIX

QUESTIONNAIRE 1

TOTAL QUALITY MANAGEMENT (TQM) PRACTICES AMONG MANUFACTURING FIRMS IN GHANA.

MANUFACTURING FIRMS WITH TQM ADOPTION

Dear respondent, this is an academic survey questionnaire which is aimed at collecting data on Total Quality Management (TQM) practices among Manufacturing Firms in Ghana. Your kind and objective responses will significantly contribute to the topic. This study forms part of the requirements leading to the award of Master of Philosophy in Operations Management at the University of Ghana Business School. Any information provided is strictly for academic purposes and would be treated with utmost confidentiality.

Please Tick were appropriate.

Company Characteristics

1. Type of firm ownership? a). Sole Proprietorship b) Partnership c) Limited Liability d) Publicly owned e) Public/ Private Ownership

2. Number of Employees? a).1-100 b).101-200 c).201-300 d).301-400 e). 401-500

   f). Above 500.

3. What is the firm's primary Product? ……...

4. Does the organization belong to ISO 9000? a). YES b). NO

5. If NO please state the reasons and skip to Q7……..

6. Does the organization apply ISO 9000 certification as a guideline for establishing quality system? a). YES b). No

7. What is the Perception level of TQM in the organization?

   a. Adequate b. Moderate c. High

8. What is the satisfaction level of TQM implementation and practice in the organization?
   a. High b. Medium c. Low

9. How often does the firm review its quality policy?
   a). Monthly b). Quarterly c). Half yearly d). Yearly d) Every two years

10. Please indicate how much you agree with these statements.

Scale 1: Leadership	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Top management actively participates in quality management activities					
Top management learns quality-related concepts and skills.					
Top management encourages employee involvement in quality management activities					
Top management arranges adequate resources for employee education and training					
Top management discusses many quality-related issues in top management meetings					
Top management focuses on product quality rather than yields					

Scale 2: Supplier Quality Management	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm has established long-term cooperative relations with suppliers.					
Our firm regards product quality as the most important factor in selecting suppliers.					
Our firm always gives feedback on the performance of suppliers' products					
Our firm regularly conducts supplier quality audit					

Scale 3: *Process Control and Improvement*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm is kept neat and clean at all times.					
Process capability meets production requirements					
Production equipment is well maintained according to the maintenance plan					
Our firm implements various inspections effectively (e.g., incoming, process and final products)					
Our firm uses Deming Wheel extensively for process control and improvement					

Scale 4: Employee Participation	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm has several QC circles (within one function)					
Employees are actively involved in quality-related activities					
Our firm implements quality improvement suggestion extensively					
Most employees' suggestions are implemented after an evaluation					
Reporting work problems is encouraged in our firm					

Scale 5: Recognition and Reward	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm improves working conditions in order to recognize employee quality management efforts					
Our firm has a salary promotion scheme to encourage employee participation in quality management					
Promotions are based on work quality in our firm					
Excellent suggestions are financially rewarded					
Recognition and reward activities effectively stimulate employee commitment to quality management					

Scale 6: Education and Training	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Employees are encouraged to undertake education and training					
Resources are available for employee education and training in our firm					
Most employees in our firm are trained on how to use quality management methods (tools)					
Quality awareness education is given to employees					

Scale 7: Customer Focus	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Quality-related customer complaints are treated with top priority					
Our firm conducts a customer satisfaction survey every year					
Our firm always conducts market research in order to collect suggestions for improving our products					
Our firm has been customer focused for the past 10 years					
Our firm collects extensive complaint information from customers					

11. Kindly rank the following factors using 1 to 7 to employee satisfaction.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	Ranking
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

12. Kindly rank the following factors on a using 1 to 7 to product quality.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	Ranking
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

13. Kindly rank the following factors using 1 to 7 to Customer Satisfaction.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	**Ranking**
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

14. Using the 7 point likert scale please indicate the perceived overall employee satisfaction level in your firm. (1-Extremely unsatisfied: 2-Somewhat Unsatisfied: 3- Unsatisfied: 4-Neutral: 5-Somwhat Satisfied: 6-Satisfied: 7- Extremely Satisfied).

Scale 1: Employee Satisfaction	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The employee satisfaction level in your firm							
Employee compensation and promotion							
Internal communication to Employees							
Employee education and training on quality							
Employee- Management relationship							
Healthy working condition							

15. Compared with the other firms within the same industry in Ghana, please state the situation of your primary products.

Scale 2: Product Quality	**Below Average**	**Average**	**Above Average**	**Best in the Industry**
The performance of your primary products				
The conformity rates of your primary products to customer need				
Customer complain rate of your primary products				
The defect rates of your primary products				
The internal failure costs as a percentage of annual output value				
The external failure costs as a percentage of annual sales				

16. Using the 7 point likert scale please indicate the customer satisfaction level tothe firm's product
(1-Extremely unsatisfied: 2-Somewhat unsatisfied: 3- Unsatisfied: 4- Neutral: 5-Somewhat satisfied: 6-Satisfied: 7- Extremely satisfied).

Scale 3: Customer Satisfaction	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The customer satisfaction level for product quality provided							
Customer satisfaction level of product usage							
Customer satisfaction level in responding to complaints							
Customer satisfaction on the reliability of product							

17. Which of these Seven quality tools does your firm use in identifying product defect/problem?
a). Pareto charts b). Flow Charts c). Scatter Diagram d). Fish Bone/ Ishikawa Diagram
e). Histogram f). Check Sheet g). Statistical Control Charts

18. Apart from the above what other tools does your firm uses in identifying product defect/problem?

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    ……

19. What are the challenges faced by the firm in the implementation of total quality management (TQM)?

    ……

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    ……

QUESTIONNAIRE 2

TOTAL QUALITY MANAGEMENT (TQM) PRACTICES AMONG MANUFACTURING FIRMS IN GHANA.

LOCAL FIRMS WITHOU TQM ADOPTION

Dear respondent, this is an academic survey questionnaire which is aimed at collecting data on of Total Quality Management (TQM) practices among Manufacturing Firms in Ghana. Your kind and objective responses will significantly contribute to the topic. This study forms part of the requirements leading to the award of Master of Philosophy in Operations Management at the University of Ghana Business School. Any information provided is strictly for academic purposes and would be treated with utmost confidentiality.

Please Tick were appropriate.

Company Characteristics

1. Type of firm ownership? a). Sole Proprietorship b) Partnership c) Limited Liability d) Publicly owned
2. Number of Employees? a).1-20 b).21-40 c).41-60 d).61-80 e). 81-100 f). above 100.
3. What is the firm's primary Product? ……...
4. Does the organization belong to ISO 9000? a). YES b). NO
5. If NO please state the reasons and skip to Q7……
6. Do you have a quality control Department? a) YES b) NO
7. Does the organization apply ISO 9000 certification as a guideline for establishing quality system? a). YES b). No
8. Is the firm aware of the Total Quality Management (TQM) Concept? a). YES b). NO
9. If NO, please state the reasons …….
10. What is the Perception level of TQM in the organization?

    a. Low b. Moderate c. High

11. What is the satisfaction level of TQM implementation and practice in the organization?
    b. High b. Medium c. Low

12. Please indicate how much you agreed with these statements.

Scale 1: Leadership	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Top management actively participates in quality management activities					
Top management learns quality-related concepts and skills.					
Top management encourages employee involvement in quality management activities					
Top management arranges adequate resources for employee education and training					
Top management discusses many quality-related issues in top management meetings					
Top management focuses on product quality rather than yields					

Scale 2: Supplier Quality Management	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm has established long-term cooperative relations with suppliers.					
Our firm regards product quality as the most important factor in selecting suppliers.					
Our firm always gives feedback on the performance of suppliers' products					
Our firm regularly conducts supplier quality audit					

Scale 3: *Process Control and Improvement*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm is kept neat and clean at all times.					
Process capability meets production requirements					
Production equipment is well maintained according to the maintenance plan					
Our firm implements various inspections effectively (e.g., incoming, process and final products)					
Our firm uses Deming Wheel extensively for process control and improvement					
Scale 4: Employee Participation	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm has several QC circles (within one function)					
Employees are actively involved in quality-related activities					
Our firm implements quality improvement suggestion extensively					
Most employees' suggestions are implemented after an evaluation					
Reporting work problems is encouraged in our firm					

Scale 5: Recognition and Reward	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm improves working conditions in order to recognize employee quality management efforts					
Our firm has a salary promotion scheme to encourage employee participation in quality management					
Promotions are based on work quality in our firm					
Excellent suggestions are financially rewarded					
Recognition and reward activities effectively stimulate employee commitment to quality management					

Scale 6: Education and Training	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Employees are encouraged to undertake education and training					
Resources are available for employee education and training in our firm					
Most employees in our firm are trained on how to use quality management methods (tools)					
Quality awareness education is given to employees					

Scale 7: Customer Focus	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Quality-related customer complaints are treated with top priority					
Our firm conducts a customer satisfaction survey every year					
Our firm always conducts market research in order to collect suggestions for improving our products					
Our firm has been customer focused for a the past 10 years					
Our firm collects extensive complaint information from customers					

13. Kindly rank the following factors using 1 to 7 to employee satisfaction.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	Ranking
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

14. Kindly rank the following factors using 1 to 7 to product quality.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	Ranking
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

15. Kindly rank the following factors using 1 to 7 to Customer Satisfaction.
(Where 1-Very unimportant: 2-Somewhat unimportant: 3- Unimportant: 4- Neutral: 5-Important: 6- Somewhat important: 7-Very important).

Factors	**Ranking**
Top Management Commitment	
Education and Training	
Process control and improvement	
Customer Focus	
Supplier Quality Management	
Employee Participation	
Reward and Recognition	

16. Using the 7 point likert scale please indicate the perceived overall employee satisfaction level in your firm. (1-Extremely unsatisfied: 2-Somewhat Unsatisfied: 3- Unsatisfied: 4-Neutral: 5-Somwhat Satisfied: 6-Satisfied: 7- Extremely Satisfied).

Scale 1: Employee Satisfaction	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The employee satisfaction level in your firm							
Employee compensation and promotion							
Internal communication to Employees							
Employee education and training on quality							
Employee- Management relationship							
Healthy working condition							

17. Compared with the other firms within the same industry in Ghana, please state the situation of your primary products.

Scale 2: Product Quality	**Below Average**	**Average**	**Above Average**	**Best in the Industry**
The performance of your primary products				
The conformity rates of your primary products to customer need				
Customer complain rate of your primary products				
The defect rates of your primary products				
The internal failure costs as a percentage of annual output value				
The external failure costs as a percentage of annual sales				

18. Using the 7 point likert scale please indicate the customer satisfaction level tothe firm's product. (1-Extremely unsatisfied: 2-Somewhat unsatisfied: 3- Unsatisfied: 4- Neutral: 5-Somewhat satisfied: 6-Satisfied: 7- Extremely satisfied).

Scale 3: Customer Satisfaction	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The customer satisfaction level for product quality provided							
Customer satisfaction level of product usage							
Customer satisfaction level in responding to complaints							
Customer satisfaction on the reliability of product							

19. Which of these Seven quality tools does your firm use in identifying product defect/problem?
    a). Pareto charts b). Flow Charts c). Scatter Diagram d). Fish Bone/ Ishikawa Diagram
    e). Histogram f). Check Sheet g). Statistical Control Charts

20. Apart from the above what other tools does your firm uses in identifying product defect/problem?

    ……

    ……

21. What are the challenges faced by the firm in the implementation of total quality management (TQM)?

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