ASSESSING TOTAL QUALITY MANAGEMENT PRACTICES ON PRINT PROJECTS IN THE GHANAIAN PRINTING INDUSTRY

By

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MASTER OF SCIENCE IN PROJECT MANAGEMENT

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material to which a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

The Ghanaian printing industry executes several printing projects such as government textbooks, election material, packaging material year after year. Due to globalization and trade freedom, competition has been stiff in the printing sector over the years. Total Quality Management is an established mechanism of quality management for achievement in other areas of the world in the manufacturing and service industries. It has helped enhance quality, operating costs, timelines for delivery and productivity. However, its application was slow and haphazard in the Ghanaian printing sector. Therefore, the study evaluated the present state of total quality management practices on print projects in the Ghanaian printing industry using quantitative instruments complemented with qualitative instruments such as observation and unstructured main informant interview to collect information. A total of forty-two (42) questionnaires were analysed using IBM SPSS statistics version 23 to conduct reliability analysis, descriptive statistics, and Friedman's test to evaluate TQM practice and rank some TQM obstacles in the Ghanaian printing sector. It was observed that there was the presence of Total Quality Management in the printing sector with an adequate level of awareness among employees, training was carried out with specifics on "on-the-job training" however its frequency was as and when needed. Most of the printing firms had a quality policy which drives the quality agenda. Critical success variables such as supplier management, customer focus, leadership have emerged as main concepts being implemented with little emphasis on staff development, empowerment, and involvement. The major hinderances to TQM implementation were identified as Human obstacles (such as low skills, low salaries), poor planning, employee attitude towards quality and absence of leadership. However, TQM application was achieved in part owing to the absence of hard TQM components such as Statistical Process Control, continuous improvement, etc. The study adds to empirical research on the application of total quality management in the printing sector. A framework for managing the execution of Total Quality Management has been suggested.

Keywords: *Printing Industry, Total Quality Management, Continuous Improvement, Critical Success Factors, TQM Implementation, Soft TQM, Hard TQM, Quality Tools*

TABLE OF CONTENTS

LIST OF TABLES

Table No. Title Page

LIST OF FIGURES

Figure No Caption **Page**

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

There are most organizations providing precious products and services to delight their clients. To preserve their ongoing presence and survival, these organizations should have their "machines" running continuously.

There has been a major revolution in the printing sector since Johannes Guttenberg invented the movable type and demand for printed products continues to rise despite strong competition from other media types (Afeliga, 2017). Printing Industry is one of the industries of an economy that offers quality print services and products to their customers' satisfaction. The printing industry's features are no distinct from manufacturing and service organizations. According to Rothenberg et al. (2008) the printing sector supplies "tangible products such as books, magazines, labels, etc. As a supplier, but as a service, the product is highly customized and requires client and printer co-production."

As a manufacturing company, printing includes countless procedures that transform an idea into a physical form in a form of design. Kipphan (2001, p. 61) explains printing as making numerous copies of artwork by transferring ink from an image carrier to a substrate like paper. Liberation and globalization created as a result of trade between countries have altered organizations environment's dynamics. Research by Hirano (2013) shows that the competitive environment of organizations has altered the concept of most manufacturing organizations in their belief that producing products is their primary objective. Organizations are constantly striving to enhance their activities to stay in business because of the nature of worldwide market competition (Jochem et al., 2010).

Competition helps to produce products and services in abundance, thus providing customers with the opportunity to select from various choices. The quality offered by the organization is one of the key indicators for customers’ selection of goods or services (Graham et al., 2014).

Okunola's (2009) research as cited by Akangbe (2016) indicates that customers were not concerned about the quality of printed products during the early days of print production in Nigeria. however, consumers today attach great significance to the quality of the products they

buy. Printing businesses, therefore, need to attach a great deal of importance to the products they produce.

A study by Tahir (2005) as cited by Akangbe's (2016) revealed publications produced in Nigeria did not fulfil the assessment requirements set by their Universal Program Office for Basic Education and therefore of low quality. McGregor (1996) as cited by Graham et al., (2014) also stresses that the quality of publications generated in developing nations is very low. It generally has a one-year life span instead of 3-5 years. This has made most clients of print products, particularly publishers in Ghana, prefer to outsource their jobs outside of Ghana, particularly Asian nations, to be guaranteed of high-quality printing (Boadu, 2016).

In order to satisfy the strong competition that threatens their survival, many organizations have embraced a variety of continuous improvement approaches (Oakland, 2014). Pankaj et al. (2018) point out the following as some of the quality management systems adopted by some organizations; Total Quality Management, Total Productive Maintenance, Total Production System, Just in Time Production, Lean Production, Six-Sigma, ISO 9001.

Singh et al. (2010) as cited by Singh (2011) shows that the main difficulties facing companies in India are; cost reduction, quality improvement and improved shipping schedules. He further points out that quality assurance was used to replace a quality inspection by most companies in India to overcome quality as a challenge. However, lead manufacturing organizations in Australia have adopted total quality procedures, hence their capacity to manufacture according to world-class standards. According to Samson (1997) organizations that lag lead manufacturing organizations have badly applied the initiative for quality improvement, hence their inability to match the top organizations.

Pankaj et al. (2018) assert that a lot of studies have been carried out on Total Quality Management more than any other quality management system and Graham (2009) also concludes in his studies that Total Quality Management contributes significantly to the performance of organizations, particularly when viewed over the long term. Total Quality Management appears to be one of the quality management systems accepted and adopted for operational excellence and quality improvement by most organizations around the world (Karia and Asaari, 2006). The fundamental premise of total quality management is to assess client requirements and develop processes and procedures to guarantee consistency in client expectations (Lord, 1994)

According to a research by Akangbe (2016) in the Nigerian printing sector, most printing firms did not have a quality control unit, staff or understanding of total quality management, but in Ghana, Graham et al. (2015) indicates that quality programs have been established by the printing sector, but it is the only premise on customer requirements focusing on decreasing operational cost. He further avows that; quality programs are less thorough and a top-down approach in the Ghanaian printing sector.

To appreciate the advantages connected with total quality management for the Ghanaian printing sector, Total quality management as implemented by lead manufacturing organizations around the globe should be fully implemented to assist decrease offshore outsourcing and become a top-notch printing organization.

Therefore, this research is essential to evaluate the level of implementation of total quality management as a quality management system in Ghana's printing sector and to determine how to implement total quality management for the multiple press houses in order to reap its advantages.

1.2 Statement of Problem

By producing quality products, Japan grew to become one of the "economic powerhouses" in the globe (Dahlgaard et al., 2002). Companies now operate beyond domestic limits, thus providing quality products has become a requirement for most organisations.

Uyar (2009) as cited by Pankaj et al. (2018) stresses that in today's world of manufacturing, nearly every organization embarks on a single type of quality management system with the ultimate objective of enhancing the process and product quality.

"Quality management systems, in particular, Total Quality Management (TQM), has gained higher worldwide recognition and are being pursued in many countries" (Faisal et al., 2011). A study by Mersha and Merrick (1997) quoted in Montes et al. (2003) shows that total quality management has been defined as a suitable technique for improving competition in developing nations.

To assist enhance quality, other organizations have introduced different types of technology. However, the implementation of these techniques without a quality management system will only accelerate the process, but not improve the general quality of the product and service.

Companies in Ghana face tougher competition from the remainder of the globe. With customers raising knowledge of quality, press houses have no choice, but to provide value-print products and services always to the delight of clients. Hap hazardous implementation of quality policies taken by press houses leads to low client trust (discontent), low quality, high printing costs.

For printing houses to remain in business, press houses need to embrace a quality management scheme such as Total Quality Management to decrease poor product quality, enhance shipping timelines and decrease operating costs.

1.3 Objectives

The main aim of the study is to assess total quality management practices on print projects in the Ghanaian printing industry. The specific objectives to be achieved are;

1. To evaluate the current state of Total Quality Management practices on print projects in the Ghanaian printing industry.
2. To identify factors that hinder the implementation of Total Quality Management on the execution of print projects in the Ghanaian printing industry.
3. To outline ways for implementation of total quality management on print projects in the Ghanaian printing industry.

1.4 Research Questions

1. What is the state of total quality management practices on print projects in the Ghanaian printing industry?
2. What are the factors that impede the implementation of total quality management practices in the execution of print projects in the Ghanaian printing industry?
3. How can total quality management principles be implemented in the Ghanaian printing industry?

1.5 Significance of the Study

Ghana's printing sector faces severe competition from other areas of the globe. Because of the printing industry's low-quality publications, most clients, particularly publishers and other agencies, prefer to outsource their print projects to overseas printing firms to be guaranteed of

the quality they need. Most other businesses such as construction, health, service have embraced Total Quality Management methods and their operations have improved. Therefore, this research seeks to find out the present state of total quality management practices on print projects executed by the Ghanaian printing industry. This will assist in redefining and redirecting its application to enhance the industry's efficiency in the execution of print project's quality. The research will also serve as a source of reference by filling TQM's gap in the printing sector.

1.6 Scope of the Study

The scope of the study was limited to printing firms in Accra who have registered with the Ghana Book Development Council and their names are published on the website of GBDC and located in the Greater Accra Region. Graham (2009) asserts that these firms are engaged in the production of bookwork, has their own production machines, and prints on paper only

1.7 Methodology

The strategy for this study was a cross-sectional survey. Stockemer (2019) explained that a cross-sectional survey involves the gathering of information about respondents at a point in time. This strategy was used to gather data about printing houses in Ghana within the stipulated period for the study. The research design for the study was descriptive. This helped explore the current state of the practice of Total Quality Management in the printing industry of Ghana.

The quantitative method was used, complemented with some tools used in a qualitative study comprising of observation and informant interview. It is also conclusive in nature. A questionnaire was the main tool for the collection of primary data.

1.8 Limitation of the Study

Some printing firms saw the researcher as a competitor, not a researcher hence their unwillingness to partake in the study. Also, it took the researcher a lot of time to convince some printing firms to fill the questionnaire. Finally, the administration of most the printing firms had to approve the questionnaire before administering to respondents, most of the organization

distributed the questionnaire to their selected staff which saw more of management staff filling the questionnaire.

1.9 Structure of the Report

The study is divided into five (5) chapters. Chapter One (Introduction) gives the general background to the study and covers the following areas: Background, Statement of the Problem, Aims and Objectives, Research Questions, Significance/ Justification of the Study, Scope, Definition of Terms, Key Assumptions and Organization of the Text.

Chapter Two (Review of Related Literature) reviews the theoretical and conceptual framework of the dissertation. Chapter Three (Methodology) captures the Research Design, Population, Sampling, Data Collection Instruments and Procedures and Data Analysis Plan for the study.

Chapter Four is the Presentation and Discussion of Findings while Chapter Five captures Summary, Conclusions, and Recommendations

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

As a quality management system, Total Quality Management focuses on quality as one of many organizations ' main strategic issues. Customer satisfaction is a fundamental premise for total quality management. Whatever organization, competition is very rigid and the reputation associated with poor quality also lasts longer than one can suppose (Oakland, 2014).

In the past, quality programs were carried out on the basis of an organization installed capacity, hence the connotation of "manufacturing-based quality." The connotation portrayed by businesses moved from the production of goods and facilities in the expectation that customers would purchase. However, companies produce to satisfy the taste and expectations of customers in contemporary manufacturing.

Because of this, most companies have strategized and amended their strategies and visions to incorporate quality into them to satisfy their clients continually and survive in the competitive market. More studies have shown that total quality management is the way to go, particularly within developing nations, to tackle such problems.

Therefore, this literature seeks to evaluate the present state of the Ghanaian Printing Industry with a focus on Total Quality Management methods in the execution of print projects.

2.2 Overview of the Printing Industry

The expansion of the service sector and industry has led to a rise in demand for printed products (Afeliga, 2017). Printed products such as textbooks, cheques, receipt books, invoices, etc are being used by these sectors for their daily operations. Despite the printing industry’s contribution and existence for a long time, there has been no database regarding its performance. Printing refers to the reproduction of multiple copies of artwork from an image carrier to a substrate. Ruggles (1991) as cited by Graham and Owusu (2015) emphasis that sales, marketing, finance, design are essential services while the actual reproduction of multiple copies as manufacturing.

Several processes are involved in the reproduction of multiple copies of artwork. All these processes have a connection to the other in the print production value chain. Kipphan, (2001, p. 46) grouped the printing process into three stages namely; prepress, press and post-press. This is shown in Figure 2-1

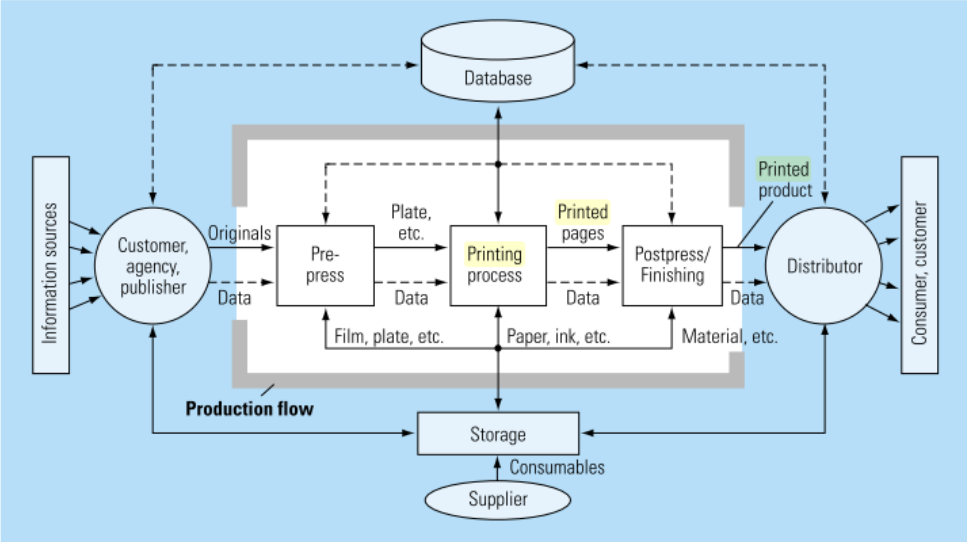

Figure 2-1: A print production workflow
Source: Kipphan, 2001

Kipphan (2001) expatiate that prepress includes all activities carried out before actual printing. It includes page layout, page design, pre-flighting, scanning, plate making. The printing stage involves making multiple copies of the artwork generated from the prepress stage. It includes makeready and adjustments of the machine to ensure a satisfactory print outcome. Post-press involves all activities carried out to ensure a complete publication is out. These include folding, collating, stitching, binding, etc which are carried after printing.

Graham and Owusu (2015) avow that the printing industry is capital-intensive, labour-intensive and material intensive by nature coupled with low hindrance for a start-up. Small, micro- and medium-sized printing companies that meet both local and domestic print requirements dominate the sector. Majority of the printing firms in Ghana are situated in Accra and Kumasi

Technology has also shaped the way the industry operates hence the reliance on computers by the industry. This has created a factor for efficiency, productivity, and profitability in usage. This has also led to the reduction of human factors needed at each stage of the production process.

Kipphan (2001), Walker (2011) classifies printing into six based on the technology used. These include offset lithography mostly used by the industry, gravure, flexography, letterpress, screen printing, and nonimpact printing also known as digital printing.

In a typical press house, press-ready files are submitted to printing firms for assessment and printability. After an assessment, clients sign-off for production to begin. Production begins with prepress. At this stage, press-ready files are taken through a first quality stage known as pre-flighting. Files are prepared and sent for plate-making if all pre-flight checks are ok. There is a sign-off of the press-ready files by a senior person at the prepress stage before final plate making. Plates are sent to the production room for actual printing.

2.3 Evolution of Quality Management Systems

Pankaj et al. (2018) claim that the works of Shewhart, Deming, Feigenbaum, Ishikawa, Taguchi, Crosby, Juran, Tachii Ohno and Goldratt have given extensive attention to quality management systems. Feigenbaum proposed the notion of total quality control that was later converted into Total Quality Management. As a necessity for efficient quality management, Deming (1982) launched his 14 points. Ishikawa is commonly connected with the use of quality circles to achieve continuous improvement and the introduction of the fishbone diagram to solve problems. Juran (1989) recognized quality planning, control and enhancement as the quality management process features in his works.

Dahlgaard et al. (2002), Weckenmann et al. (2015) identified the following process towards the evolution of Total Quality Management; inspection of quality, quality control, quality assurance, total management of quality. The primary aim of quality through inspection would be to quarantine adulterated products from acceptable ones and either be redesigned, scrapped or offered for sale on the market as a product of low quality.

Weckenmann et al. (2015) asserts a more optimized way to assist solve the three main problems in considering a product (high quality, low price, low shipping time) was introduced to achieve a competitive advantage over rivals. This resulted in a product-to-process paradigm change. They further avowed that the second phase of Quality Control engaged the use of monitored competencies, written specification, measurement, and standardization. During this era, the use of the control chart was launched. However, two kinds of variation were recognized as being categorized as; variation induced by random causes; variation attributable to unique causes

through Shewhart identification and variation segregation. Inspection and quality control thus becomes the primary procedures for fulfilling client expectations regarding offered products and services (Weckenmann et al., 2015).

Using quality manuals, quality costs, process control, and quality audit systems helped move from quality control to quality assurance. Therefore, quality assurance focuses on the avoidance of defects while quality control stresses identifying flaws.

The fourth phase of the evolutionary processes resulted in Total Quality Management involving the knowledge and execution of the values and ideas of quality management that apply to all aspects of the organization. Deming (1982), as mentioned in (Dahlgaard, Kristensen and Kanji, 2002), stressed that quality problems are within the scope of leadership and therefore the use of statistical techniques can assist trace the origin. While Deming (1982) and Juran (1989) emphasized the use of statistical techniques to resolve quality problems, Crosby (1982), on the other side, claimed that quality is a requirement; compliant and defects can only be solved by evaluating non-compliance costs.

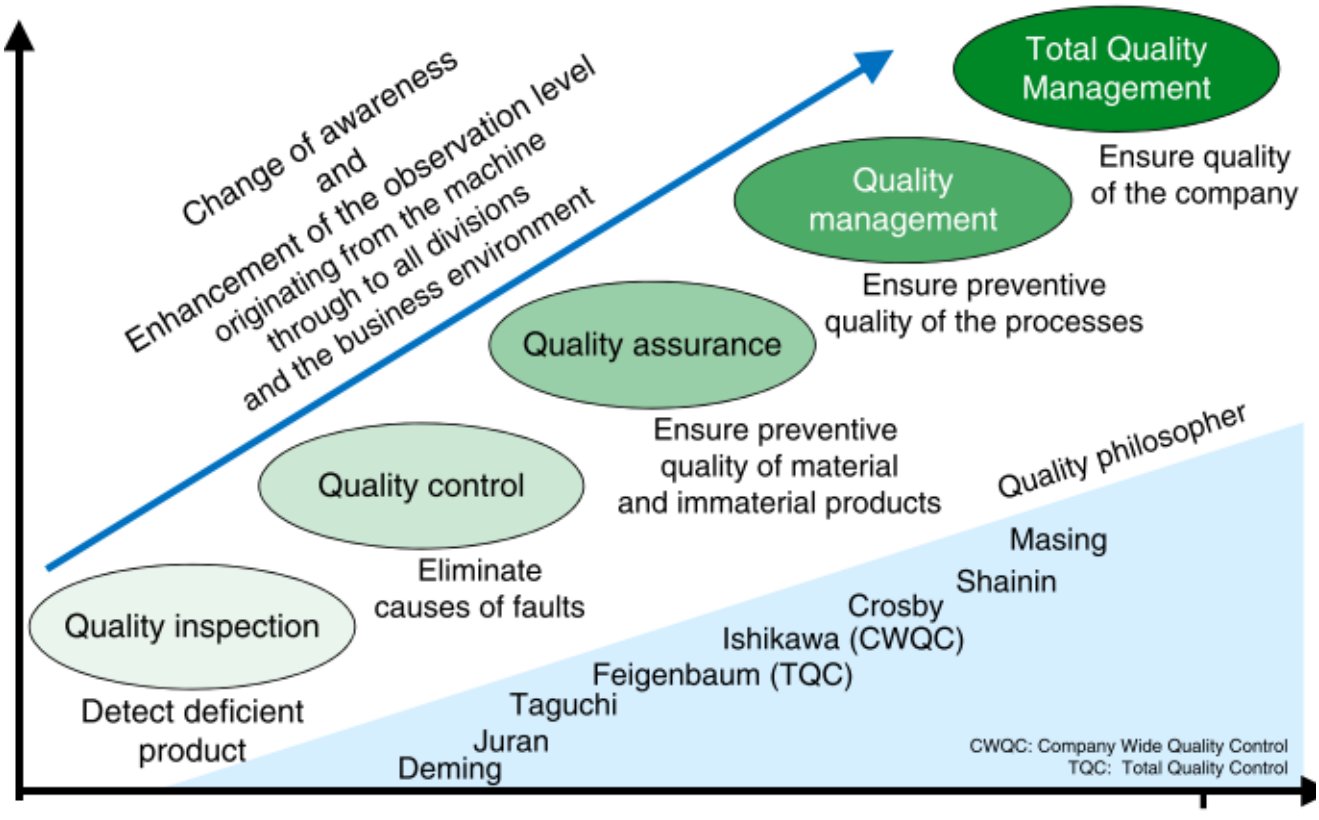

Figure 2-2: Quality Management Evolution
Source (Weckenmann et al., 2015)

2.4 The Concept of Total Quality Management

The notion of quality is very broad and correlates with human requirements as well. For quality, there is no single universal definition. There are several ways that many academics and professionals have described quality. Crosby's (1982) proposals were in compliance with client requirements and zero defects. On the other side, Juran (1989) claimed that the quality characteristics relating to a product or service were based on the customer's required characteristics and free of deficiencies. International Standard Organizations (ISO) expresses quality as the totality of features and features that determine the capacity to meet the requirements and expectations of the clients. Deming (1982) saw quality as meeting a customer's current and future requirements. Oakland (2014) expressed quality from the point of view of Feigenbaum by defining quality as

> "The total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use will meet the expectation by the customer".

Definition of quality in printing toes to definitions as propagated by Garvin's (1984) (Dahlgaard, Kristensen and Kanji, 2002). Garvin described quality as transcendent, user-based, product-based, specification-compliance, price-related satisfaction. Graham & Owusu (2015) however, agrees with Crosby's (1982) propagated quality definition, which expressed quality as compliance with the client requirement. The printing sector subscribes this definition to since most print orders are client specifics.

From the above definitions, therefore, it can be concluded that quality is expatiated as delighting clients by providing superior products and services to meet an organization's strategic objectives.

Total Quality Management focuses on human and work procedures with the primary objective of ensuring customer satisfaction and ongoing organizational performance enhancement (Akangbe, 2016). To handle people, equipment and machines, TQM utilizes scientific management to create high-quality products and services within an organization. Dahlgaard et al. (2002) articulated total quality management as attaining complete quality through the involvement of everyone in the organisation as a whole. TQM, therefore, integrates client quality product and service requirements.

2.5 Critical Success Factors

Afeliga, (2017) asserts that several definitions have been provided to total quality management practices by many researchers. He also avows Total quality management practices as "critical areas that an organisation must fulfil in order to fulfil its mission by examining and categorizing its impact." As cited by Afeliga (2017), Brotherton et al (1996) also expatiate total quality management practices as areas within an organisation that will provide the highest competitive leverage.

No single research has recognized a prevalent set of principles for executing total quality management methods successfully. Some helpful framework created by some quality award systems such as the Deming Prize; the European Quality Award, the Malcolm Baldrige National Quality Award, the Kanji Business Excellence Model helps to implement Total Quality Management and evaluate the business performance of organisations.

There are important TQM elements to consider before any effort to implement TQM. These elements are known as Critical Success Factors. For successful implementation of TQM during print project execution, printing companies need to comprehend critical success factors in order to successfully implement total quality management. These critical success factors serve as a guide and foundation to the effective execution of Total Quality Management's.

In their research, Fotopoulos and Psomas (2009) recognized Total Quality Management as a network of interdependent components such as critical factors, methods, procedures, etc. Curry and Kadash (2002) cited by Fotopoulos and Psomas (2009) disclosed that if total quality management lacks certain components, the probability of yielding the least outcomes from Total Quality Management is very high.

Graham and Owusu (2015) found that the development, empowerment, and involvement of employees are the main success factors in implementing total quality management in the printing sector. They also stated the sharing of data (communication), joint problem solving (teamwork) without constraints as some of the variables for the effective execution of total quality management. The sampling technique, however, was subjective, hence could not solicit for views from other firms that are not perceived to be practicing total quality management.

Jaca and Psomas (2015) avow five latent practices for successful implementation of total quality management. These include quality practices of top management, process management, employee quality management, customer focus, employee knowledge, and education. It could

be deduced from their studies that, four of the five variables relate to the human element of leadership, prioritization of the latent factors were not established.

Graham et al. (2014) also highlight two main factors in the effective implementation of total quality management, including top management governance and excellent quality printing policy. Sahoo and Yadav (2018) identified leadership style, strategic planning, empowerment and participation of employees, quality education and training as main procedures for the management of overall performance. On the other side, Fotopoulos and Psomas (2009) categorized the success factors into two: "Soft TQM and Hard TQM components. The hard TQM components mostly adopted by some organizations as stated in his research consist of quality instruments "B7 and N7," namely: Affinity Diagrams, Relation Diagrams, Tree Diagrams, Matrix Diagrams, Arrow Diagrams, Process Decision Program Charts, Matrix Data Analysis, Flowcharts, Control Charts, Scatter Diagrams, Histograms, Check Sheets, Process Map.

The hard TQM components are seen as tools for improving performance. For process improvement, customer satisfaction and also the market leader, an organization cannot use hard TQM Elements alone. Together, hard TQM elements should be used together with Soft TQM components, which include strategic quality planning, provider management, employee development, empowerment and involvement, client concentrate, process management, continuous improvement, training to achieve the overall quality goal of a firm.

2.6 Soft Total Quality Management Elements

Fotopoulos and Psomas (2009) take the view that Soft TQM Practices has a huge influence on quality improvement with hard TQM Practices playing a secondary role. This is also being confirmed by Yunis et al. (2013) who asserted that soft TQM practices have a higher impact on competitive strategy formulation than hard TQM practices. Graham et al. (2014), Graham and Owusu (2015), Graham (2009) confirm soft TQM for higher quality in the printing industry of Ghana. Soft TQM practices should be adopted first and seconded by hard TQM Practices. The soft side of TQM relates to social and behavioural factors such as organizational culture, leadership, top management commitment and must be accepted by organisations before attempting to implement Total Quality Management.

2.6.1 Customer Focus

Most organizations exist to meet their clients' demands. This means that customer feedback should be handled with the highest priority. There are clients both internally and externally. Internal customers are process owners while end consumers of a product are external clients. Recognition of customers first serves as the traits of successful organisations. The main considerations for ensuring customer satisfaction are knowledge, comprehension and meeting client expectations. TQM involves every portion of the organization and hence each operates as a client to each other. The print quality depends on the quality of the sheets generated and the quality of the printing influences the finishing value. Deming (1982) viewed customer satisfaction as the ultimate goal of TQM and most researchers had resorted to analysing the impact of TQM implementation on customer satisfaction. Customer focus efforts can be improved by giving top priority to customer complaints, collecting information on customer satisfaction (Edu, 2006).

2.6.2 Management Commitment

Total quality management is a way of life and therefore management must introduce it. Several studies have disclosed that, owing to less engagement from top management, the application of Total Quality Management fails (Edu, 2006). The outline of quality objectives, quality policies, and quality plans are a crucial job for leadership in the overall execution of quality management. Top and middle management must show their dedication, comprehension, and dissemination to all employees of TQM Principles. Hence the recognition of Top management commitment in the creation of systems, goals by the Malcom Bridge National Quality award.

2.6.3 Employee Development, Empowerment, and Participation

Models of quality awards such as the Malcolm Bridge National Quality Awards reaffirm the need to train and develop staff in order to enhance their capacity, comprehension, effectiveness, and efficiency. Encouraging staff to contribute from their wealth of experience is empowerment. Since the worker is the one directly engaged in the execution of the employment, they understand most of the quality problems and are therefore in the best position to make the best choice when allowed to improve quality. Employee involvement rejects traditional obstacles that distinct management from staff and promotes management to seek views from

staff. The participation of staff in organizations willingly in quality management practices is one of the basic grounds for complete quality.

Dimitriades (2000) defines two worker empowerment approaches; participatory empowerment and self-management. Partial decision-making power and accountability are provided to staff under participatory empowerment and they are also encouraged to suggest methods to improve quality, procedures and customer service. Employees assume complete power in self-management strategy, propose and enforce the decision. However, the participatory strategy may be suitable as low skills are recognized in the printing sector.

2.6.4 Continuous Improvement

TQM includes improving all operations and activities on a continuous basis. Once it is recognized that customer satisfaction can only be achieved through the provision of a high-quality product. The only way to preserve high-level customer satisfaction is by continuously improving product and process quality. This will lead to product and process quality improvement as well as customer satisfaction. The elimination of waste and a powerful emphasis on prevention rather than cure is one of the main parts of the continuous improvement process (Edu, 2006).

2.6.5 Quality driven Culture

Responsibility for customer satisfaction must be felt by all employees within the organisation. This can be achieved by their inclusion in decision making, development of plans and strategies. Maul et al. (2001) as cited by Willar et al., (2016) asserts that organisations should review their internal culture attempt to introduce TQM. There should be a sense of urgency towards quality driven by management.

2.7 Hard Total Quality Management elements

Hard TQM components are the tools, techniques, and methods an organization uses to allow decision-making in leadership. Ishikawa (1979), one of Japan's quality gurus, has created numerous instruments and methods essential to effective TQM. He claimed that in order for

TQM to be effective, employees and first-line supervisors/managers must understand the instruments and methods of using the information to create choices.

The ultimate aim of the information is to take data-based action, which can be used to understand the real condition, evaluation, process control, and regulation as well as traditional decision recognition and dismissal.

These tools are highly proven tools by quality gurus such as Crosby, Ishikawa, Deming and it's easy to remember. 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. Edu (2006) assets that employees within an ISO 9000 manufacturing environment use the basic tools to measure the level of adherence and conformity to documented processes and specifications. These tools are reviewed below since they are vital in the development and implementation of continuous improvement.

2.7.1 Process Flowchart

According to the Project Management Institute (2017), a process flowchart indicates the steps in a job, operation or process that transforms one or more input into outputs. It indicates decision points, and overall order of processing by mapping the standard operating procedures of an organization within a horizontal value chain. It indicates the finite details and obtains a thorough description. It enables continuous improvement and also identify where quality defects can occur or inculcate quality checks. In print project execution, employees are empowered to identify defects and resolve such challenges relating to quality in print project execution.

2.7.2 Check Sheet

A check sheet is often a phenomenal place to start a quality improvement program. It simple and easy tool used to summarize occurrences of specific events. Often, team members have ample amount of time to gather an accurate amount of data. A check sheet usually contains a list of defects identified through brainstorming or observation in relation to a defective product. Identified causes of defects in the process are pictorially represented in the form of pareto or histogram. To ensure operators consistently use the check sheet, its design should have constraints that are must be operation (Dahlgaard, Kristensen and Kanii, 2002).

2.7.3 Control Chart

Control charts are very important quality control tool. Control charts give a graphical comparison of process performance to predetermined standards (Dahlgaard, Kristensen and Kanii, 2002). These charts are used to evaluate whether a process is operating within expectations relative to some measured value such as weight, width, or volume. Three lines are depicted on a typical control chart. These are the mean line, the lower control limit, and the upper control limit. The lower limit and the upper limit define the desired level of control. The aim of the control chart is to identify specific causes of variation (Edu, 2006).

2.7.4 Pareto Chart

The Pareto diagram provides both the comparative dividing and the complete allocation of kinds of mistakes, issues or triggers of mistakes. It is used to define the reasons for bad performance depending on the degree of significance of these factors. In most instances, 80–90% of the complete number of mistakes in project execution are caused by a few kinds of errors (issues or triggers), which makes identifying these mistakes very essential in terms of continuous improvement (Dahlgaard, Kristensen and Kanii, 2002).

Often referred to as the 80-20 principle, Juran (1989) has discovered in quality management that only a few factors give rise to the majority of performance issues and expenses (Russel and Taylor, 2011). Fixing the few main factors of most performance issues will have the biggest price effect.

Pareto analysis diagram is used to create a diagram depending on the proportion of deficiencies each cause of bad performance in the ascending sequence. It is implemented to measure the number of deficiencies in the item and then develop a frequency distribution of this information for each of the distinct feasible triggers of bad performance. The allocation of frequencies, known as a diagram from Pareto, is a helpful visual aid to address significant issues. The next stage after identification and ranking of these problems is to find out the root cause hence the use of cause and effect diagram.

2.7.5 Cause and Effect Diagram.

The diagram for cause-and-effect is also called an Ishikawa diagram, first presented by Kaoru Ishikawa (1979). The diagram is sometimes referred to as the fishbone diagram. It links the of cause and effect can be helpful instruments to assume the sources of performance errors and issues. The graphical perspective of the particular performance issue and its causative components. The power of the diagram is that it is both easy to use and comprehend and can be used at all stages in an organisation (Dahlgaard, Kristensen and Kanii, 2002).

The ultimate goal is to identify all the possible causes of an effect and investigate further with the intention of discovering the root causes. Most causes can be attributed to personnel, materials, environment, management, methods, machinery, etc. It is mostly paired with the 5 why's analysis to discover the root cause. That is when the root cause is eliminated, an organization can prevent the issue from happening and hence bringing the process back to conformance. The causes of a problem can be explored through brainstorming and also analyses of series of data with the help of other quality tools (Edu, 2006).

2.7.6 Histogram

A histogram is a graph that indicates a variable's frequency distribution. The histogram from chosen samples shows the allocation sort for a certain variable display, such as whether it has a standard or symmetrical allocation. A check sheet is used to plot the histogram to determine the number of defects with all the triggers of low performance (Edu, 2006). The histogram that shows the frequency of the information concerning a specific performance issue (Dahlgaard, Kristensen and Kanii, 2002).

2.7.7 Scatter Diagram

Scatter diagrams depict relations between two variables. They are especially helpful for the detection of the association between two factors or the degree of a linear relation. The higher the level of correlation, the more linear is the diagram's remark (Edu, 2006). The diagram contains both the x and y axis which is used to depict the two variables being assessed. Y axis is generally a dependant variable whiles the x-axis is an independent variable. On the other hand, the more scattered the observations in the diagram, the less correlation there is between

the variables. Two variables could also be correlated negatively so that an increase in one of the variables is associated with a decrease in the other (Dahlgaard, Kristensen and Kanii, 2002).

2.8 Barriers to TQM Implementation

Total quality management has become a competitive strategy for most organizations across the globe. More recent studies suggest the following as benefits an organisation reaps as a result of the implementation of Total Quality Management; less defective products, reduction in reworks, cost reductions, improved business competitiveness, increased in market share, enhanced employee satisfaction and customer satisfaction as asserted by (Kihiu, 2016). Although some form of quality management has been adopted, it was less comprehensive and also a top-down approach as noted by (Rockson, 2009). Sahoo and Yadav (2018) identified the following as some of the factors limiting the implementation of total quality management in most organizations; lack of knowledge and understanding of total quality management practices, insufficient technical expertise, poor training, and insufficient resources.

According to Rajashekhar (1999) as cited by Bhat and Rajashekhar (2009) lack of long term supplier relationships, dependence on traditional incentive schemes, numerical targets, performance ratings, slogans for quality improvement, improper training as some hindering factors for total quality management implementation in India.

Bhat and Rajashekhar (2009) also identified lack of benchmarking, employees resistant to change, inadequate resources to implement total quality management, lack of adequate measurement for quality, poor training, excess layers of management, no inclusion of quality in the strategic plan, low commitment from top management. Lack of Benchmarking and employee resistance was identified to be one of the highest barriers to implementation of total quality management according to Bhat and Rajashekhar (2009). They further recommended the EDEP (Employee development, empowerment, and participation) model to deal with employee resistance.

Talib et al (2011) as cited by (Faisal and Zillur, 2015) identified 12 barriers for successful implementation of Total Quality Management. They further classified these barriers into

- Barriers based on managerial issues
- Barriers based on people-oriented issues

- Barriers based on organizational issues

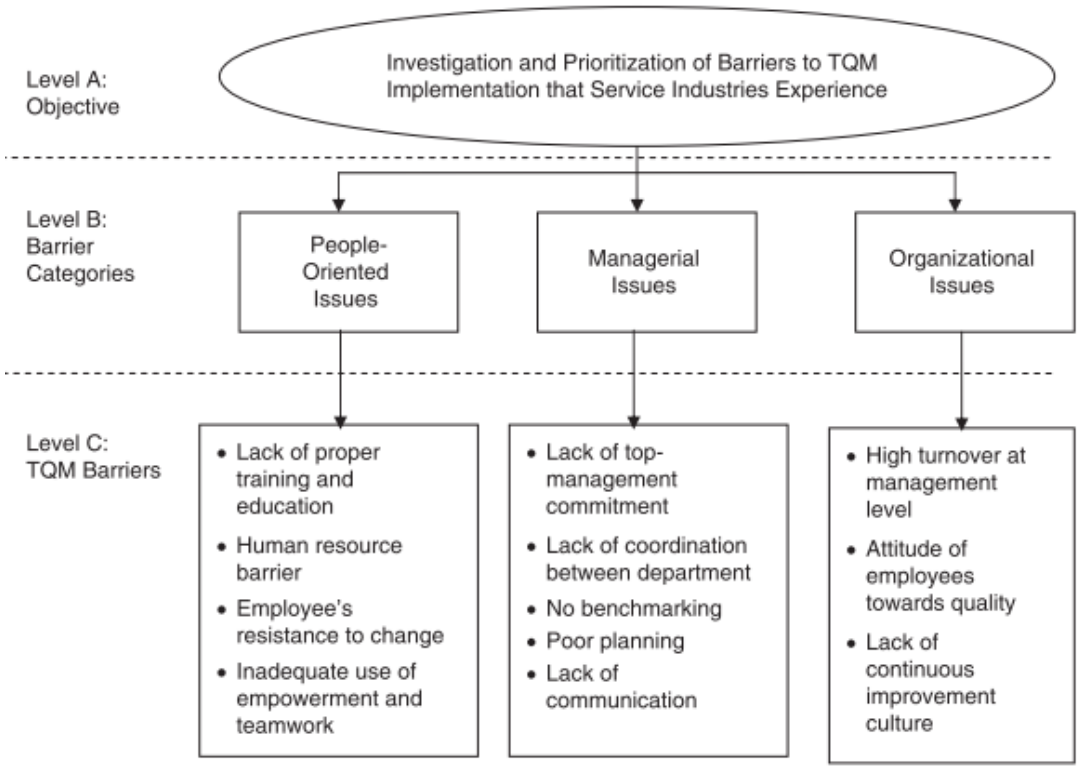

Figure 2-3: A hierarchy model of barriers to TQM Implementation.
Source *(*(Faisal and Zillur, 2015, p. 59)

Among all the barriers, Faisal and Zillur (2015) identified barriers based on managerial issues that had the highest priority hence more attention should be given to address that. Barriers associated with managerial issues included lack of communication, lack of top management commitment, lack of coordination between departments, no benchmarking and poor planning in order of critical importance as cited by Faisal and Zillur (2015) and hence in implementation should be treated in order of importance.

2.9 The implementation model for Total Quality Management

Management and employees working together can lead to a more successful run of total quality management since the transition from other organisational methods to TQM can be complicated. TQM implementation can be viewed from the quality guru's perspective, evaluation of established models and empirical research.

Morehouse and Capezio (1993) as cited by Aghazadeh (2002) establish the model below for the successful implementation of total quality management.

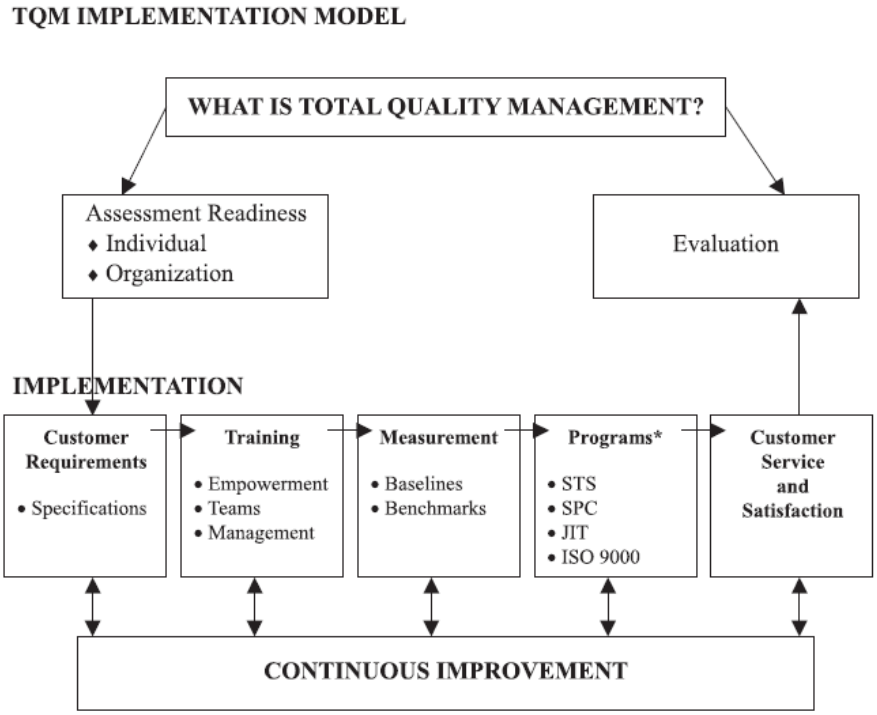

Figure 2-4: TQM Implementation model
Source: Aghazadeh, (2002)

Figure 2.4 above shows explores how an organisation can implement total quality management through the interrelationship between soft and hard elements of TQM to achieve the ultimate goal of customer satisfaction. TQM is an integrated concept and therefore requires all employees from the shop floor to managers to contribute to its success during implementation. Readiness assesses the whole organisation and individuals play a crucial role in the implementation of TQM. A readiness assessment can be done as identified by (Aghazadeh, 2002) is to organise weekly meetings to discuss the best method for implementation. Readiness assessment should be done at the various levels of the organisation, prioritization of the hindrances should be taken into consideration. This model however limitation lacks some of the most important success factors for implementation such as top management commitment and thus limits it to only satisfy the customer through the use of only hard TQM elements.

2.10 Conclusion

In conclusion, Total quality management is an important tool if an organisation wants to improve its quality. Several hindrances exist during the implementation of TQM; however, TQM should be viewed from the long term if its intended benefits are to be reaped. The goal of this literature was to relate identify the success factors for the successful implementation of total quality, the benefits associated with total quality implementation and some hindrances towards its implementation.

The reviewed literature identifies several total quality management practices that need to be present for successful adoption of total quality management and ranks several barriers that need to be dealt with for successful implementation of total quality management. Most of the previous studies reviewed on TQM were conducted in countries outside Ghana and the printing industry and hence. this study is expected to fill this gap.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

A lot of studies have been conducted in Total Quality Management and several conclusions have been drawn based on the methodology adopted. The validity and reliability of a study was determined by the methodology adopted. The methodology adopted for a study needs to be bias-free.

In this chapter, the procedures employed in carrying out the study was explained. The research strategy, research method, population, sampling design, sampling frame, sample size, data collection methods and data analysis methods have been presented.

3.2 Research Strategy

The strategy for this study was a cross-sectional survey. Stockemer (2019) explained that a cross-sectional survey involves the gathering of information about respondents at a particular point in time. This strategy was used to gather data about printing houses in Ghana within the stipulated period for the study. The design of the study shall be descriptive in nature. This helped explore the current state of the practice of Total Quality Management in the printing industry of Ghana.

3.3 Research Methodology

A quantitative method was used for this study. Quantitative research involves the measurement of quantity. It is usually expressed in numerical form. Rajaseker et al as cited in (Afeliga, 2017) indicates the following as the characteristics of quantitative method

- It uses numbers
- Evidence gathered is evaluated
- Presentation of results is often in tables and graphs
- It is also conclusive in nature.

3.4 Population

Ghana's printing sector was the target population. Graham (2009) avows that a study by Ghana's Statistical Service revealed that most printing companies are located in the Greater Accra Region and also a majority of printing works are carried out in the region. This is also being confirmed by the total number of registered members of Ghana Printers and Paper converters association and also a list of published printing houses on Ghana Book Development Council's website hence the selection of the printing firms in the region for the study.

3.5 Sample Frame

The sample frame for the study was the list of published printing houses on Ghana Book Development Council's website. There is a total of 141 printing firms published on the Ghana Book Development Councils website 104 of the firms are located in Accra.

3.6 Sampling Size and Technique

The Yamane (1967) method was be used to select a total of 62 members from the targeted population for the study at a 95 per cent confidence interval. Participants were selected from printing firms of varying sizes engaging in commercial printing. In order not to be biased, four members each were selected from each printing press comprising of senior managers, 3 employees. This increased the sample size to 248.

Simple random sampling was used in the selection of the 62 printing firms for the study. This technique was chosen because each member has an equal chance of being selected and also this method was used in similar kinds of studies such as Akangbe (2016), Afeliga (2017), Graham et al. (2014).

3.7 Data Collection Sources and Instrument

Two types of data were collected for the study. These are primary data and secondary data. Primary data was obtained through the use of a questionnaire which was complemented with observation and informal interviews. Data obtained through observation and informal interview were used to validate the responses of the questionnaire. In the field of total quality

management, most of the studies (Graham et al. (2014), Graham and Owusu (2015), Faisal et al. (2011), Afeliga (2017)), Adjei and Mensah (2016), Akangbe (2016) used a questionnaire in conducting their studies. Data analysis was therefore based on the questionnaire responses.

The questionnaire was in four sections. The first section was aimed at collecting general information from respondents and their organisation. The second, third and the last part of the questionnaire was aimed at soliciting responses to achieve first, second and third objective respectively (see the appendix).

Secondary data was obtained through existing literature. The literature review was based on secondary data.

3.8 Data Analysis

Statistical Package for Social Sciences (SPSS) version 23 was used to analysed data received after administering the questionnaire. Reliability analysis was performed using the internal consistency method. Reliability of a questionnaire is done to determine its ability to yield consistent results. Graham et al. (2014) indicate that a Cronbach alpha of 0.6 is sufficient while there is strong reliability in variables with an alpha of 0.7 or more.

CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter details the analysis and results of the study. The study was to collect information on total quality management practices on print projects in the Ghanaian printing industry. The discussions of findings also stretch through the analysis and interpretation of the questionnaire distributed to various printing firms. Organisation and presentation of findings were in the form of tables, charts, frequency distributions to allow for easy Interpretation.

4.2 Response Rate

Two hundred and forty-eight (248) questionnaires were administered to printing firms in Accra, after several follows in person, via phone calls and emails, 45 were received from 27 printing firms. Yielding a response rate of 18.15 per cent. 3 responses were incomplete hence only 42 responses were used for the analysis hence yielding a response rate of 16.94 per cent. 5 of the responses were received online, while 40 were received in hard copy.

4.3 Characteristics of Printing Firms

4.3.1 Area of Specialization of Printing Firms

From the data shown in the table below, 66.7 per cent of the respondents were into commercial printing, 17.5 per cent were into security printing, and 5.3 per cent of the respondents were into packaging, digital and other forms. Commercial printing involves the production of textbooks, brochures, magazines. Only a few printing firms were into more than one form of operation such as commercial printing and security printing, commercial printing and digital printing, security and digital printing.

Table 4-1: Areas of Specialization of printing firms

		Responses	
		N	Per cent
Area of Specialization	Commercial Printing	38	66.7%
	Security Printing	10	17.5%
	Packaging Printing	3	5.3%
	Digital Printing	3	5.3%
	Others	3	5.3%
Total		57	100.0%

Source: Field Survey (2019)

4.3.2 Printing Firm Size

From the table below 61.9 per cent of the respondents' firms had employee size more than 100 with 7.1 per cent employing between 10 – 29 employees. None of the printing employed less than 10 employees. European Commission defines SME's as firms that employees less than 500 workers (Quartey and Kayanula, 2000). Firms with 0-9 as micro-enterprise, 10 – 99 as small enterprises and 100 – 499 as medium enterprises. In Ghana, GSS classifies organizations based on the number of employees with those employing less than 10 employees being classified as small scale enterprises while those with 10 plus employees being classified as medium and large-scale organizations. However, NBSSI uses both fixed asset value and a number of employees as cited by (Quartey and Kayanula, 2000). However, with the advent of technology which keeps shrinking the size of employees being employed by most printing firms, the definitions cannot hold but rather a more appropriate one such as turnover and capacity should be used to classify the printing firms. Therefore, the printing industry consists of Small and medium enterprises per definition of GSS as cited in (Quartey and Kayanula, 2000)

Table 4-2: Number of Employees employed by the respondents' firms

		Frequency	Per cent
Valid	10 - 29	3	7.1
	30 - 99	13	31.0
	100+	26	61.9
	Total	42	100.0

Source: Field Survey (2019)

4.3.3 Stages in Printing

From table almost all the press houses offer services in the print production workflow, with printing (press) being the dominant stage in the industry with 37.6 per cent. This means there is a lot of printing capacity in down as being objected by the publishing industry which also due to lack of capacity in town. However, most of the machines observed consist of four-colour machines, 5 colour machines, 8-colour machines which could be used to compete with other press houses publishers outsource their jobs for execution.

Table 4-3: Printing stages printing firms offer services in

		Responses	
		N	Per cent
Areas in printing stages services	Prepress	34	31.2%
	Press	41	37.6%
	Post Press	34	31.2%
Total		109	100.0%

Source: Field Survey (2019)

4.3.4 Gender

According to the results as depicted in fig below, 85.71 per cent were male, while 14.29 per cent of the respondents were female. This confirms a study by (Graham, 2009) which indicates that the printing industry is dominated by males. The reasons for the dominance of male in the printing industry as cited in (Przelski, 2005) is that the printing industry requires hard physical labour and heavy lifting, also “dirty” field.

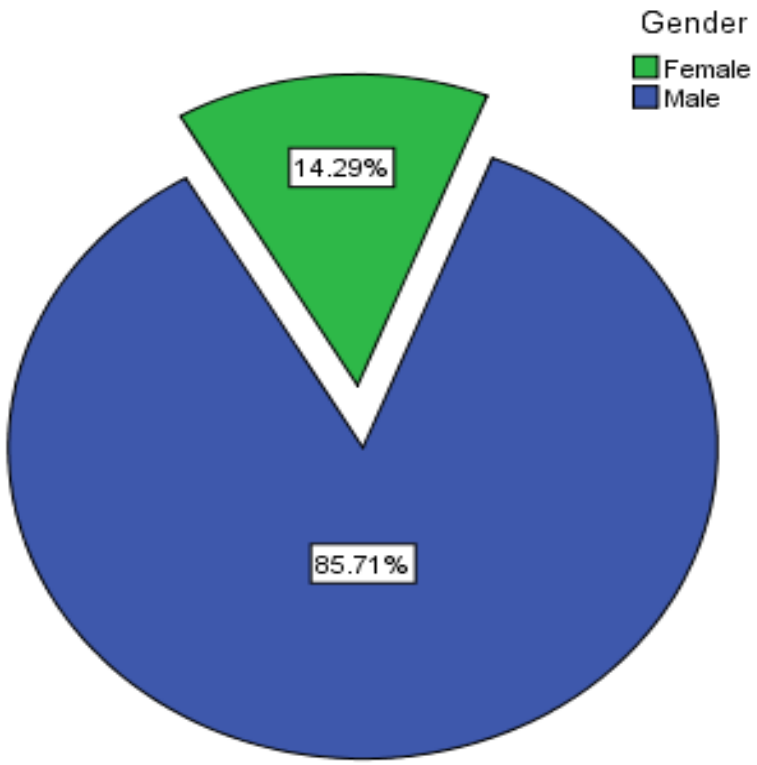

Figure 4-1: Gender of respondents in the printing industry
Source: Field Survey (2019)

4.3.5 Qualification and Years of Experience

The occupational background and years of experience were tested. From the figure, 90.4 per cent of the respondents had their qualification from the tertiary institutions while 9.6 per cent from high school. It can be deduced that employees in the printing industry have basic tertiary education where they acquire the relevant and necessary knowledge.

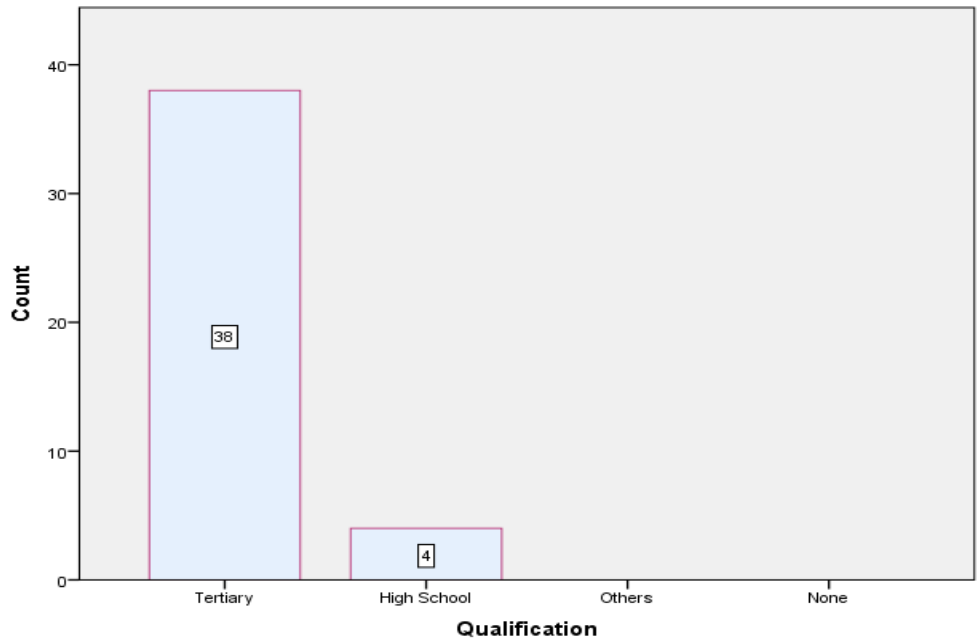

Figure 4-2: Qualification of respondents in the printing industry
Source: Field Survey (2019)

Majority of the respondents had occupied their current position within 2 years. Only a few people had occupied their current position in their respective firms for 10 years plus. The result is displayed in Figure below.

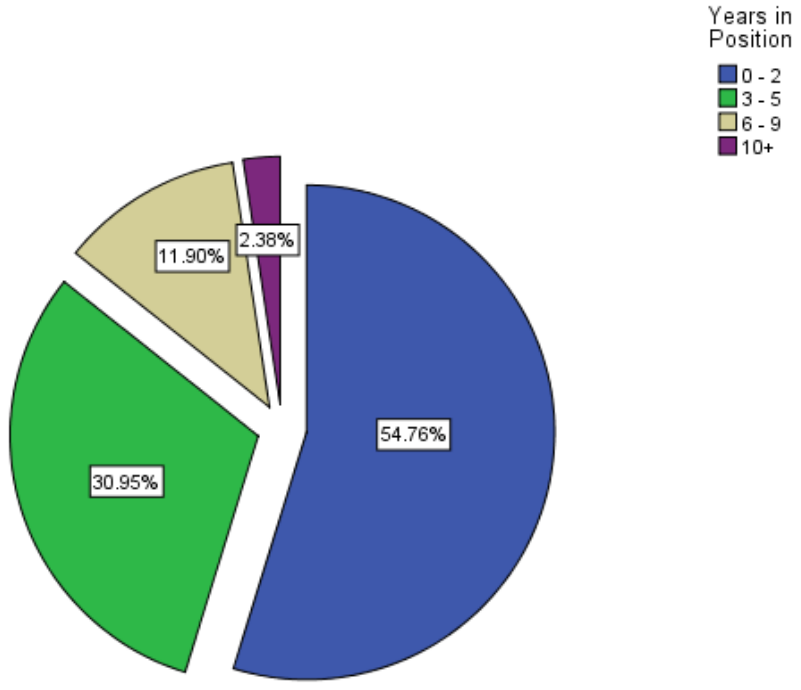

Figure 4-3: Years respondents have occupied their current position
Source: Field Survey (2019)

From fig 4.-3, there is high employee turnover in the printing industry hence a negative sign for employers. These negative signs could indicate a lack of commitment from employees and as such unwillingness of top management to commit to their development and also implement TQM.

Majority of the respondents were from varied positions in the various firms in the printing industry. Respondents comprised of Engineers, procurement personnel, marketing personnel, estimators, supervisors, binding assistants, operators. The figure below shows the position of the respondents from the study. Most of the respondents had a qualification from the tertiary level and hence an indication of their level of understanding.

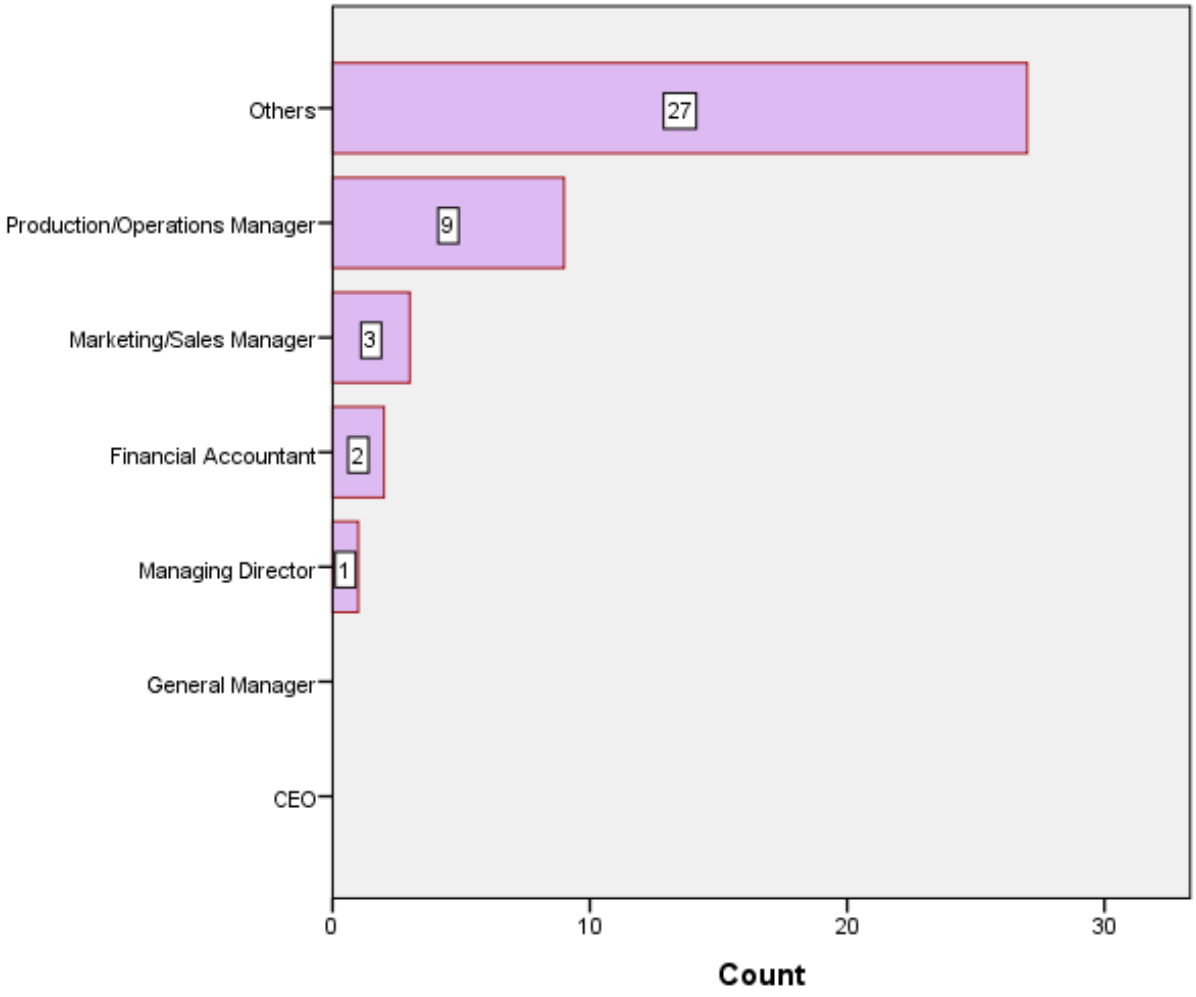

Figure 4-4: Positions occupied by respondents
Source: Field Survey (2019)

Objective One: To assess the current state of Total Quality Management Practices on Print Projects in the Ghanaian Printing Industry

4.4 State of TQM Practices on Print Projects

The current state of total quality management practices was assessed in the printing industry by checking the awareness level, adoption level, quality responsibility, quality improvement technique being used, how they describe the quality, hard TQM elements, problem-solving techniques, quality policy and process manuals usage.

All the respondents indicated that their firm has handled print projects within the last five years. These projects include Government Textbooks for Senior High schools, West African Examination Councils BECE and WASSCE, FHI/USAID Print projects, Election Material printing etc. Respondents were asked their views on project success. The response is displayed in table 4-4 below.

4.4.1 Print Project Success Factors

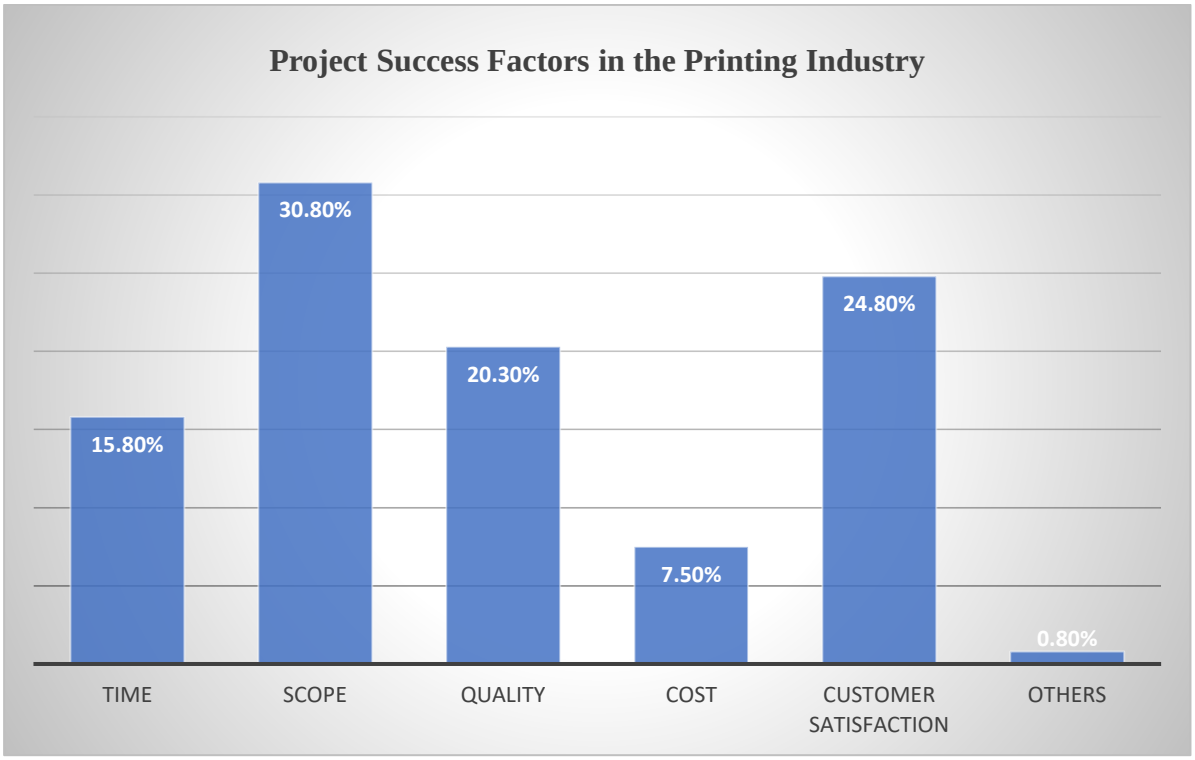

Figure 4-5: Project Success Factors in the printing industry
Source: Field Survey (2019)

Results from figure 4-5 indicated that most press houses classify the project as successful within the context of achieving the scope, quality, customer satisfaction, timelines with little emphasis on cost. 30.8 per cent places a lot of emphasis on achieving the specifications for the client. It was revealed through an interview that, printing firms place a low emphasis on cost; as bad experience with a customer will reduce the level of sales and hence, they will do everything to satisfy the client even if it will cost them more. One-person view project success from the efficient utilization of resources. With little emphasis on cost, the likelihood of printing firms incurring a loss is very high and hence measures such as post-production review of every print project should be done and strict monitoring of resources allocated for print projects.

4.4.2 TQM Awareness level of Respondents in the Ghanaian Printing Industry

Respondents were asked related questions to assess their level of awareness of total quality management. Figure 4-6 shows that 78.95 per cent of the respondents were aware of total quality management as a quality management system in the printing industry with 21.05 per cent responding that they were not aware of Total Quality Management. The sources of knowledge on awareness by the respondents were through books, internet, lecture, other colleagues, and columns in the newspapers. In an interview with some of the managers of the industry, some revealed that they were aware of it but does not understand how it works and how it can be implemented.

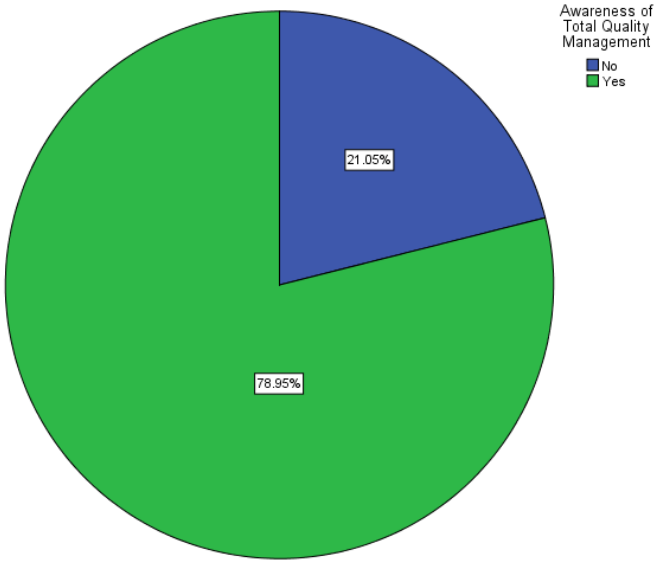

Figure 4-6: TQM Awareness level in the printing industry
Source: Field Survey (2019)

Hence it can be concluded that the level of awareness of TQM in the Ghanaian printing industry is high. The high level of TQM could be attributed to the high educational background of the respondents. The level of adoption of TQM from the data below was high. 89.29 per cent of the respondents revealed that they have adopted. Only a few of the respondents though was aware of TQM but has not adopted it and still cling to their old method of quality improvement. This is presented in the table below.

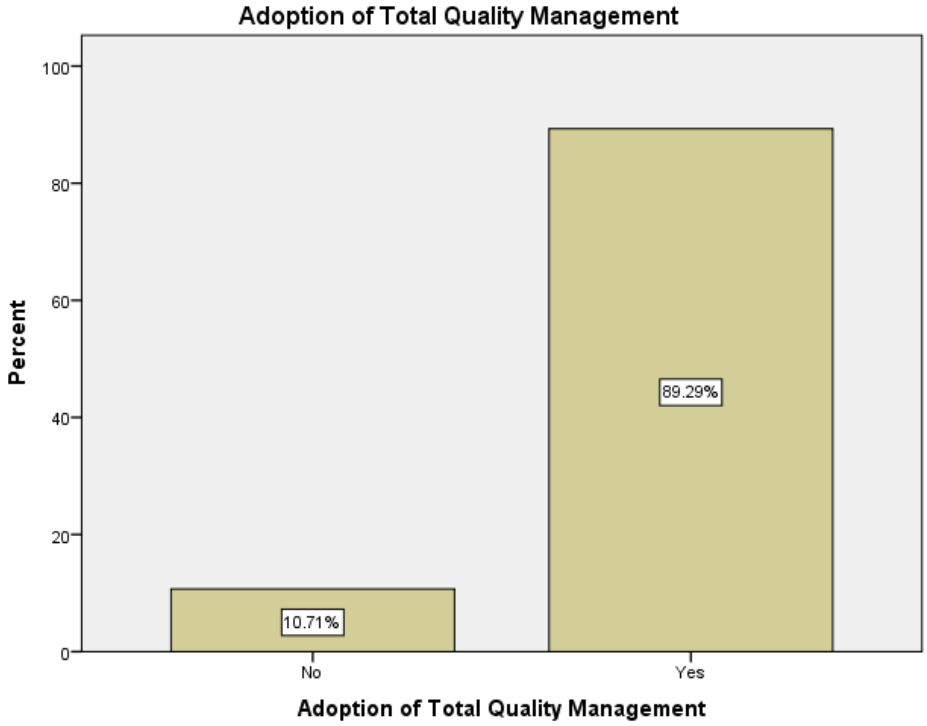

Figure 4-7: TQM level of adoption in the printing industry
Source: Field Survey (2019)

Only a few of the respondents who have adopted total quality management has benefited from it from the data shown below. 23 of the respondents representing 54.8 per cent of the total respondents indicated they have benefited from the adoption of TQM in managing a print project. Some of the benefits included cost reduction, an increase in the number of customers, waste reduction, improved print quality among others.

Table 4-4: Organizations which have reaped benefits from TQM after implementation

		Frequency	Per cent
Valid	Yes	23	54.8
Missing	System	19	45.2
Total		42	100.0

Source: Field Survey (2019)

5.7 per cent of respondents claimed they were not aware of Total Quality Management in the printing industry, however, in managing the above-named projects, the quality improvement program they use was Total Quality Management. Those who were aware of TQM but have not used it in managing projects were also using quality control technique. 11.4 per cent of the respondents also used inspection during print project execution though they were aware of TQM. The results are presented in Table 4-6 below

Table 4-5: Awareness of Total Quality Management * Quality Control Program Used Crosstabulation

		Quality Control Program Used				Total
		TQM	Quality Control	Quality Assurance	Inspection	
Awareness of Total Quality Management	No	5.7%	8.6%	2.9%	5.7%	22.9%
	Yes	51.4%	8.6%	5.7%	11.4%	77.1%
Total		57.1%	17.1%	8.6%	17.1%	100.0%

Source: Field Survey (2019)

Table 4-6: Adoption of Total Quality Management * Quality Control Program Used Crosstabulation

		Quality Control Program Used				
		TQM	Quality Control	Quality Assurance	Inspection	Total
Adoption of Total Quality Management	No	7.7%			3.8%	11.5%
	Yes	61.5%	7.7%	7.7%	11.5%	88.5%
Total		69.2%	7.7%	7.7%	15.4%	100.0%

Source: Field Survey (2019)

7.7 per cent of the respondents also indicated that they have not adopted TQM though they are aware of it, however, they also indicated that they use TQM when managing print projects. 61.5 per cent of the respondents had adopted total quality management and also used it in the management of print projects. 7.7 per cent of the respondents had adopted TQM but they used Quality Control and Quality Assurance to manage print projects which 11.5 per cent of the respondents though had adopted TQM, they relied on inspection to manage print projects. A key informant revealed that they were using TQM to manage most of their print projects since it was a requirement of the organisation, they produce for of whom most were multinational firms.

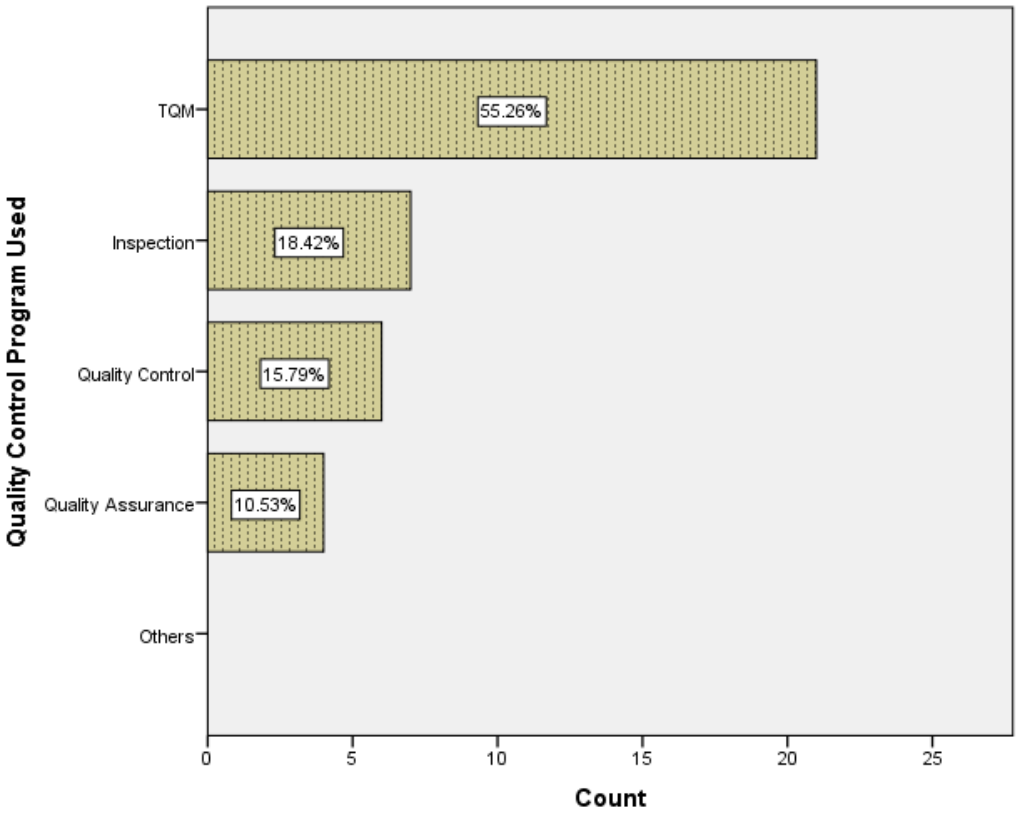

Figure 4-8: Quality improvement programs used in the printing industry
Source: Field Survey (2019)

More than half of the respondents were using Total Quality Management (55.26 per cent) in the printing industry as a quality improvement program, followed with inspection (18.42 per cent), quality control (15.79 per cent). Total Quality Management and Assurance is aimed at problem prevention.

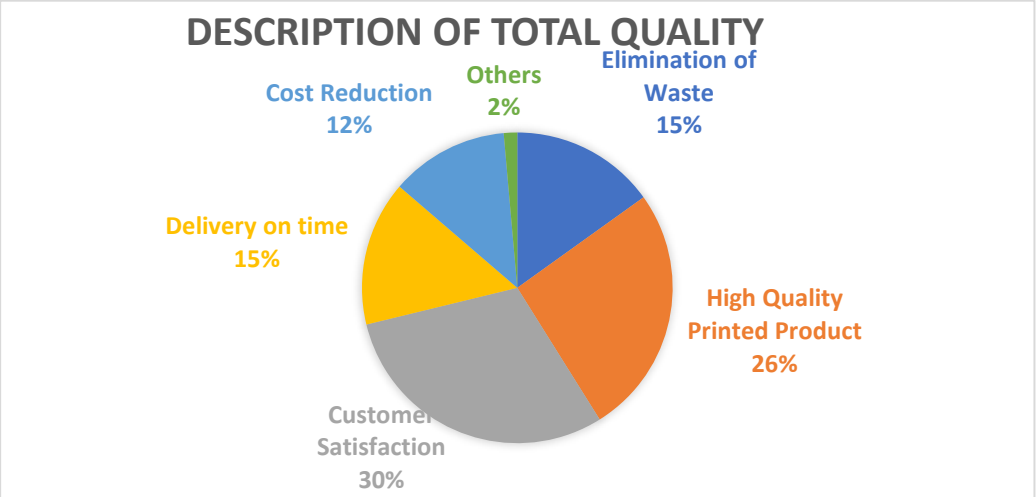

Figure 4-9: TQM description by respondents
Source: Field Survey (2019)

Respondents were asked to describe quality from the printing perspective relating it to TQM. 30.1 per cent of the respondents revealed that quality is the ability to satisfy customers, 26 per cent viewed quality from manufacturing-based that is high-quality print devoid of errors and other print-related issues such scumming, misregistration, poor trapping, ghosting, among others. 15.1 per cent of the respondents expatiated quality as eliminating waste and delivery of product on time. Little emphasis is placed on cost reduction. However, in order to fulfil the strategic goals of any organization, profit maximization is very keen. Hence there should be a balance between the other factors and cost with the ultimate aim of customer satisfaction.

One of the tenets of total quality management was the responsibility for quality within the printing firms. 39.6 per cent responded that it was everyone within the organizations' function. 32.1 per cent were of the view that quality was the sole responsibility of the production manager, 17 per cent indicated it was the various supervisors' responsibility. This is an indication of all-inclusiveness of quality in the industry but a slower pace.

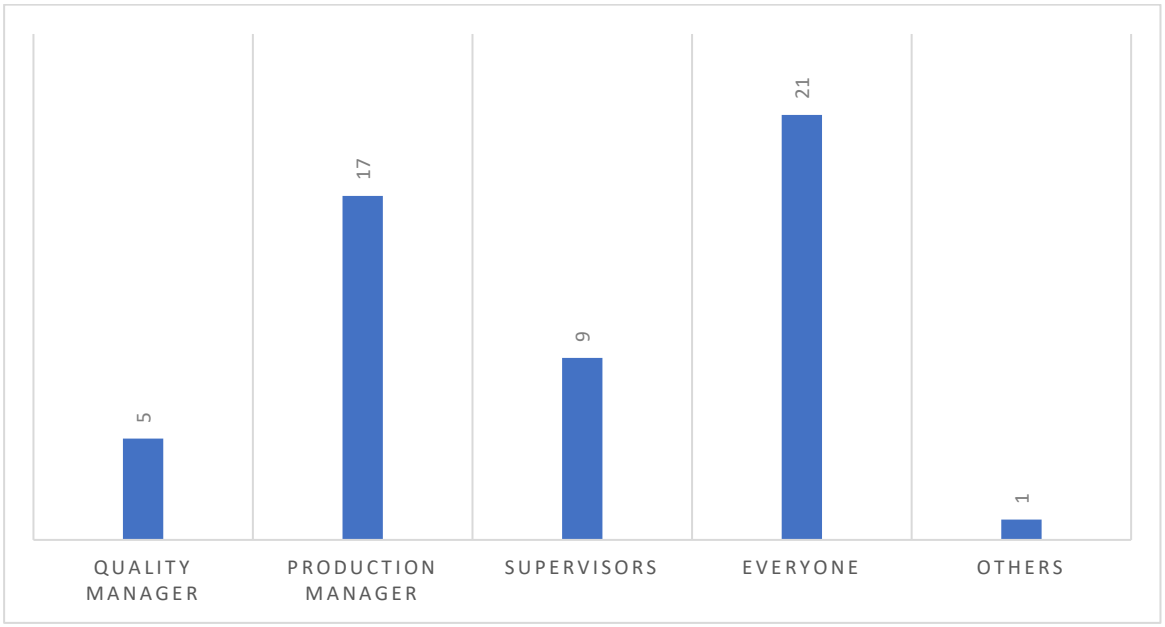

Figure 4-10: Personnel responsible for the quality
Source: Field Survey (2019)

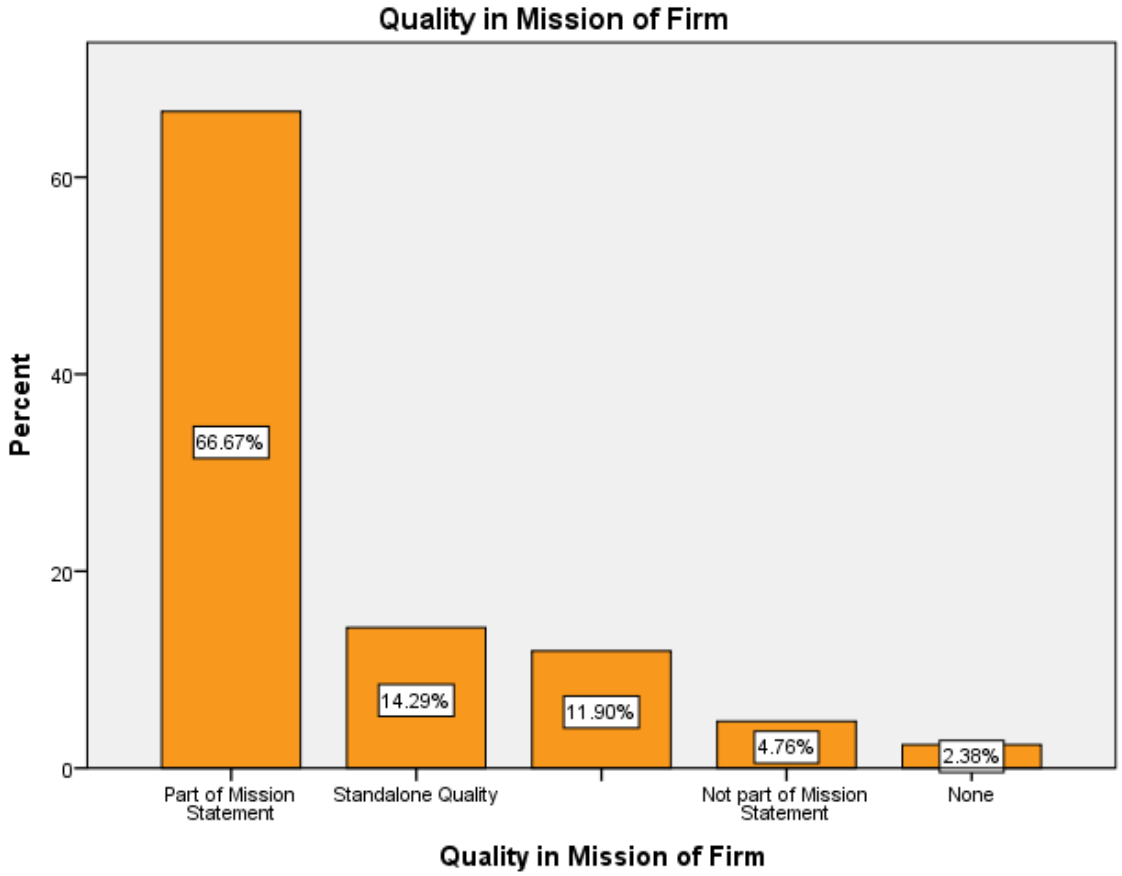

Figure 4-11: Quality in relation to the mission statement
Source: Field Survey (2019)

66.67 per cent of the respondents revealed that quality was part of the mission statement, 14.29 per cent there was a standalone quality policy, 11.90 per cent did not respond, 4.76 per cent quality policy was neither part of their mission or standalone. 2.38 per cent of the respondents did not have an idea about the quality of their firm in relation to the mission statement. The mission statement serves as a driving force for organisations and hence integrating quality into it or a standalone quality policy is very crucial towards the achievement of the overall quality goals of the organisation in the execution of projects.

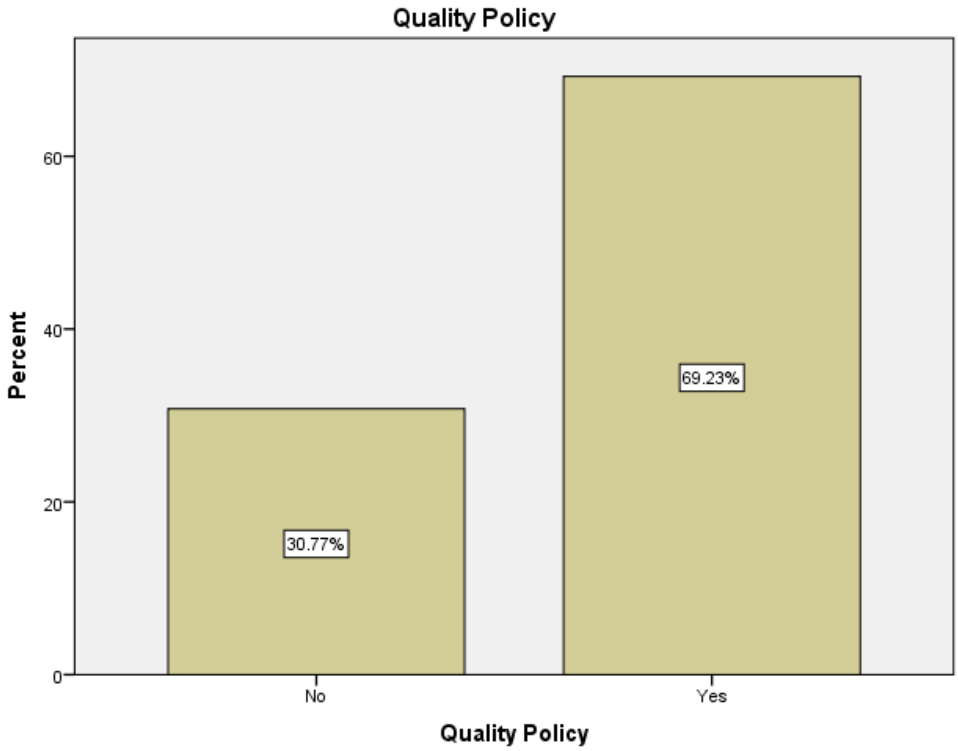

Figure 4-12: Quality Policy in the printing industry
Source: Field Survey (2019)

69.23 per cent of the respondents firm had a quality policy, 30.77 per cent did not have a quality policy. Graham and Owusu (2015) emphasis in his study that for printing firms to improve their quality, they should have a quality policy which will drive the agenda. Mensah et al. (2012) also confirm this assertion by indicating in their studies that the policy clearly stipulates the organisations' mission and vision as well as aspirations towards quality. Printing firms which need to embark on Total Quality Management should have a workable quality policy. The quality policy gives a vivid description of how a firm wants to be seen with regards to quality and it is usually expressed by top management and communicated to the entire staff. It was observed that most of the press houses which had quality policy had boldly displayed it with their vision, and mission statement at the front desk. Top managers should devise strategies of achieving the end results in the policy. (Mensah et al., 2012) avows that the use of tools, techniques and benchmarking with best practices will help firms to achieve the objectives. Although most of the printing firms had a quality policy, none of the managers interviewed could paraphrase or easily remember revealing policies may be available but its enforcement is a different issue. However, the inability of the managers to paraphrase policy does not correlate with its implementation in the printing industry.

4.4.3 Quality Tools

Quality tools used in the printing industry

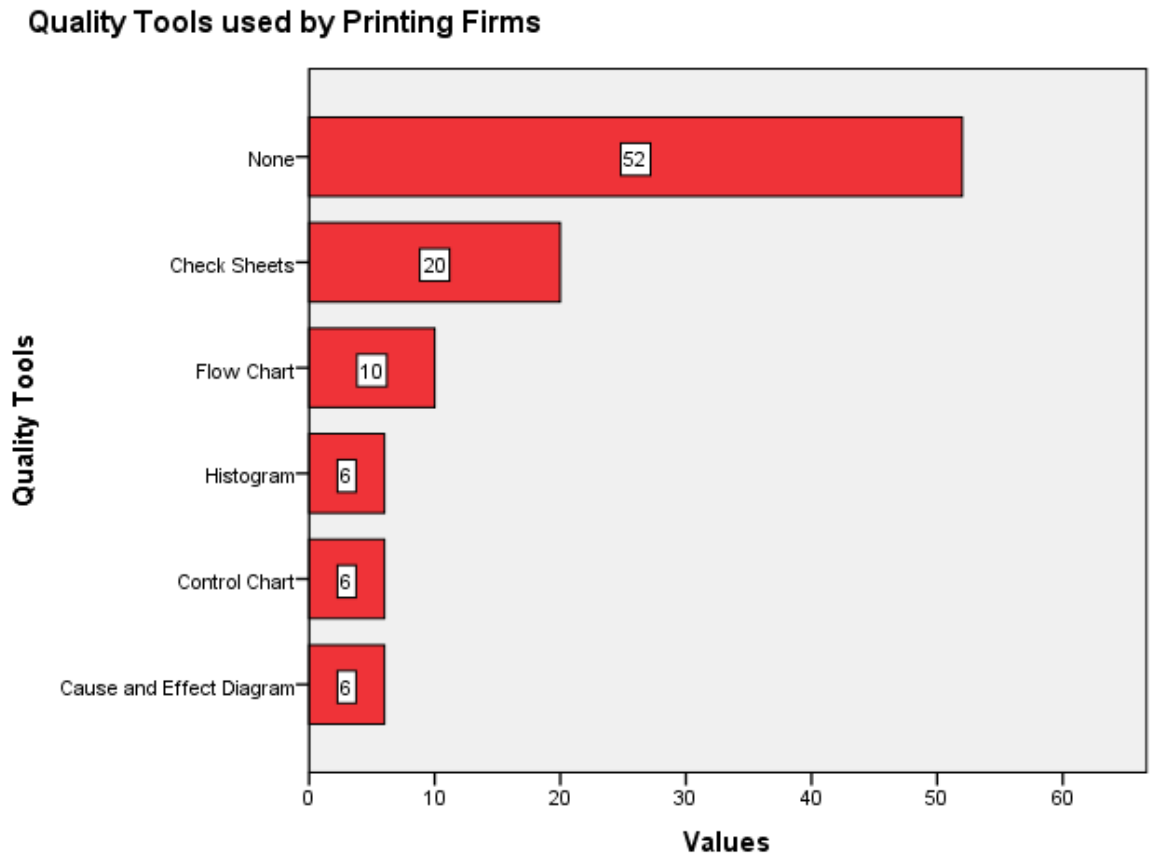

Figure 4-13: Quality tools used in the printing industry
Source: Field Survey (2019)

52 per cent of the respondents revealed they did not use any of the 7 basic tools of quality. 20 per cent used check sheets to identify defects, 10 per cent used a flow chart, 6 per cent used to cause and effect diagram, control chart and histogram each to control quality. Managers of some firm revealed that the use the quality tool since it was a requirement by some multinational firms they work with, others also revealed they use but were not able to show a trend of there was level, the root cause. It can be deduced that hard TQM element usage is very low in the printing industry. Fotopoulos and Psomas, (2009) concluded in his study that hard TQM elements such as quality tools play an important role in realizing the benefits from TQM. Rawan Ali et al. (2018) also indicates quality tools and techniques are inferior but their importance cannot be ignored red in the implementation of TQM.

4.4.4 Data Collection and Analysis

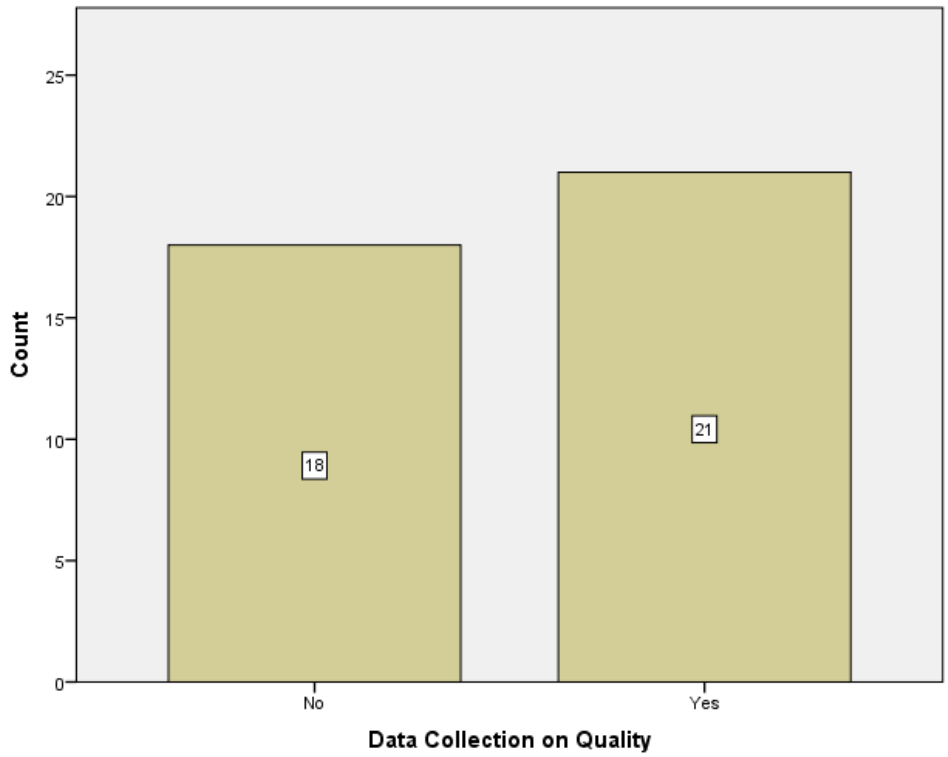

Figure 4-14: Collection of Data on quality in the printing industry
Source: Field Survey (2019)

21 of the respondents collected data on quality, while 18 per cent did not collect data on quality, 3 did not respond to the question. Some of the data collected by the respondents included but not limited to defects rate, waste for recycling, production volumes, individual performance especially the operators on quality. In order for firms to improve the quality of products and also satisfy customers, printing firms should collect data, which should be analysed to serve as a guide to preventing the occurrence of defects in print production and also seen if there has been an improvement since intervention or not.

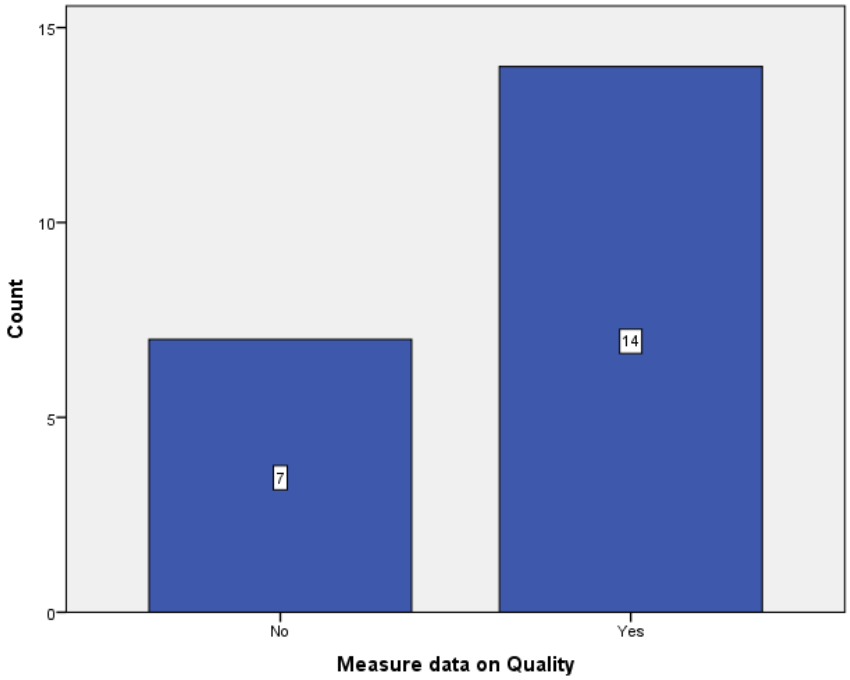

Figure 4-15: Measurement of data collected on quality
Source: Field Survey (2019)

Though some printing firms collected only 14 of the respondents who collects data measured the data that is analysed the data, 7 respondents indicated that they collect the data only for an archival purpose but no analysis was done on the data. It can be inferred that the majority of respondents who collects data on quality analyses the data to measure their performance.

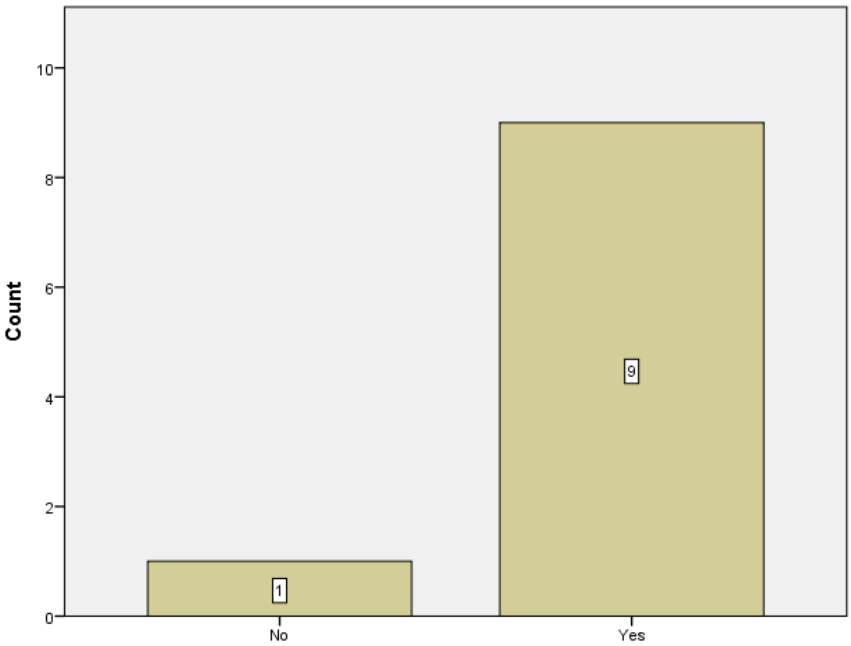

Figure 4-16: Procedures used in measuring data on quality
Source: Field Survey (2019)

Results from Figure 4-16 indicates that out of the 14 respondents who analyse data collected on quality, only 9 had a procedure for analysis of data, however, this procedure was not documented and was dependent on individual managers. Only 1 firm did not have a standard procedure for measuring data collected. Printing firms should establish a standard in the analyses of data collected to ensure the reliability of the data. Firms should, therefore, strive to collect data, measure the data and establish a process for analysis since what cannot be measured, cannot be improved.

4.4.5 Training

Results from Figure 4-17 revealed that 71.43 per cent of the respondents revealed their firm trains them. 28.75 per cent of the respondents indicated their firm does not train them. The frequency of training was assessed and its results are displayed in Figure 4-18, 35.48 per cent of the respondents indicated training was organized once a year, 19.35 per cent revealed that training was twice a year and 45.16 per cent indicated that training was not scheduled, however, it was carried out as and when it's necessary. Training should, therefore, be continuous to reflect on changes in the environment where organisations operate.

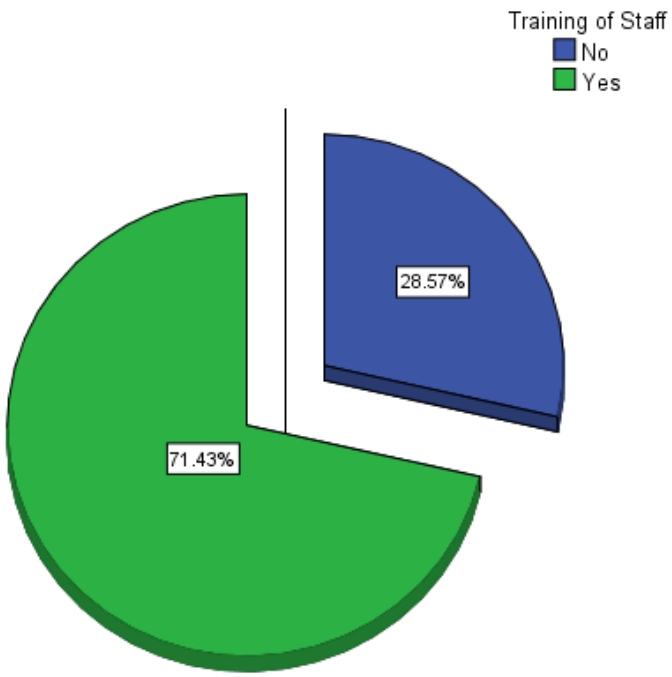

Figure 4-17: Printing firms training of staff
Source: Field Survey (2019)

Results from table 4-7 revealed that 51 per cent of training carried out were on the job training, 28.6 per cent were workshops, 16.3 per cent were seminars, only 4.1 per cent being formal training. More than half of the respondents revealed that mostly the content of the training was job-related training, 21.6 per cent of the respondents revealed that training activities were geared towards quality improvement, 19.6 per cent of the respondents also indicated the content of the training was based on problems solving and prevention. In the printing industry, training was not limited to one particular group of staff but was given to all staff as an when it is needed. 60 per cent of the respondents emphasized that everyone within the organisation was trained and also, production managers were the second group of people who received training mostly. Graham and Owusu (2015) avow that job-related skill training which integrates on the job training with formal training (classroom-type) yields best results.

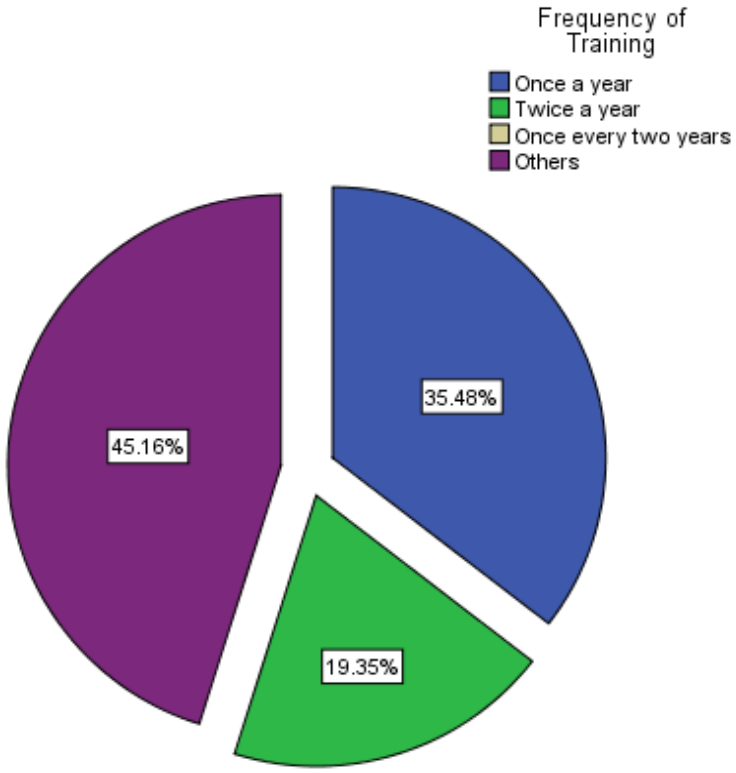

Figure 4-18: Frequency of training by printing firms
Source: Field Survey (2019)

Table 4-7: Forms of Training, Content of training, attendance of training in the printing industry

		Responses	
		N	Per cent
Training Forms	On the Job Training	25	51.0%
	Workshops	14	28.6%
	Seminars	8	16.3%
	Formal Training	2	4.1%
	Total	49	100.0%
Content of Training	Job-Related Training	29	56.9%
	Quality Achievement Training	11	21.6%
	Problem Solving and Prevention	10	19.6%
	Other	1	2.0%
	Total	51	100.0%
Attendance of Training	Chief Executive Officer	2	5.7%
	Production Manager	11	31.4%
	Quality Manager	1	2.9%
	Others	21	60.0%
	Total	35	100.0%

Source: Field Survey (2019)

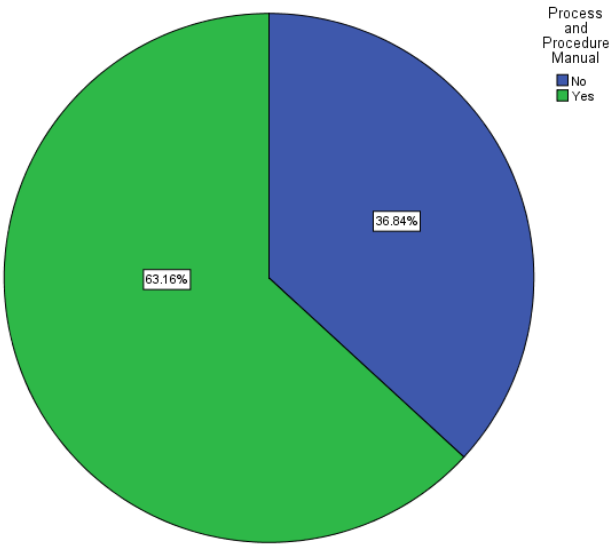

Figure 4-19: Processes and procedure manual used by printing firms
Source: Field Survey (2019)

Results from Figure 4-19 revealed that 63.16 per cent of the respondents have a process and procedure manual which serves as a reference in the execution of their daily operations. 36.84 per cent of the respondents also revealed their firm did not have a process and procedure manual. It was observed that though some printing firms had process and procedure manual, contents were only available with management especially Production Manager and also other firms had made copies of portions of the manual which is necessary for them to use on each machine.

4.5 Critical Success Factors for TQM

A five-point Likert scale ranging from (1= Strongly Disagree, 2= disagree, 3= neither agree or disagree, 4= agree, 5=strongly agree) was used to obtain responses from respondents in relation to how TQM critical success factors are being implemented in their firms. Six Success factors which relate to the printing industry derived from literature from (Faisal et al., 2011, Altayeb & Alhasanat, 2014, Graham, 2009; Graham et al., 2014b; Graham & Owusu, 2015) were used to measure implementation of the success factors in the printing industry. The six items comprised of Leadership, Employee development, empowerment and participation, customer focus, quality systems, process control and improvement, supplier management, evaluation with each having various subgroups under it. The overall Cronbach alpha was 0.962 after deletion of item number seven on Employee development, empowerment and development.

The table below presents the Cronbach alpha of the six success factors

Table 4-8: Reliability of TQM Success factors

Success Factor	**Cronbach Alpha**	**Number of Items**
Customer Focus	0.755	7
Supplier Management	0.811	7
Evaluation	0.926	8
Employee Development, Empowerment and Participation	0.816	9
Quality System, Process Control and Improvement	0.862	10
Leadership	0.909	12

Source: Field Survey (2019)

Reliability analysis on the six success factors was carried out comprising of 54 items. Cronbach alpha showed the questionnaire to reach acceptable reliability, a=0.963. All the subgroups had significant alpha more than 0.7 except employee development, empowerment and participation which had an alpha of 0.567. All the subgroups on EDEP were worthy of retention except staff are actively involved in developing quality plans and policies which would increase alpha to 0.816 after deletion. As such, the removal of such items was done.

Table 4-9: Summary of means, the standard deviation of success factors for TQM Implementation

Variable	**No of Items**	**Mean**	**Standard Deviation**	**Population**	Rank
Supplier Management	7	3.75	0.645	40	1st
Customer Focus	7	3.67	0.659	42	2nd
Leadership	12	3.55	0.797	42	3rd
Quality System, Process control and improvement	10	3.51	0.722	42	4th
Employee Development, empowerment and participation	9	3.43	0.704	42	5th
Evaluation	8	3.05	0.935	40	6th

Source: Field Survey (2019*)*

From the data displayed in table 4-9 above, respondents from the survey, perceived supplier management with the highest mean of 3.75 and SD of 0.645 most practiced TQM variable with the printing firms, followed by Customer focus (mean 3.67, SD=0.659), Leadership (mean=3.55, SD=0.797), Quality System, Process control and improvement (mean=3.51, SD=0.722), evaluation (mean=3.05, SD=0.935) with the least practised principle being evaluation (mean=3.05, SD=0.0.935).

The study, therefore, reveals that the survival of the printing firms is dependent on orders received from customers. It is evident that almost all the printing firms focus their production activities on delighting the customer.

4.5.1 Leadership role in TQM Implementation

Table 4-10: Variables in a Leadership role in TQM implementation

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
Management discusses quality related issues in management meeting	**2.5%**	**2.5%**	**25.0%**	**37.5%**	**32.5%**	**3.95**	**1st**
Management encourages employee involvement in quality management activities	4.8%	7.1%	14.3%	40.5%	33.3%	3.90	**2nd**
Management creates quality awareness among staff	5.0%	10.0%	17.5%	37.5%	30.0%	3.78	**3rd**
Management has a clear vision for embarking on quality	9.8 %	4.9%	22.0%	31.7%	31.7%	3.71	**4th**
Management empowers employees to solve quality problems	4.8%	7.1%	23.8%	40.5%	23.8%	3.71	**4th**
Management actively participates in quality	7.3 %	12.2 %	17.1 %	34.1 %	29.3%	3.66	**6th**

management activities							
Management focuses on quality rather than yields	0%	17.1%	22.0%	41.5%	19.5%	3.63	**7th**
Management Listens and acts on employee suggestions	2.4%	11.9%	40.5%	33.3%	11.9%	3.40	**8th**
Quality Policies are well communicated to staff	7.3%	9.8%	41.5%	26.8%	14.6%	3.32	**9th**
Management is supportive of Technology advancement to improve quality	11.9%	19.0%	16.7%	31.0%	21.4%	3.31	**10th**
Quality policies and practices are routinely reviewed and improved	7.1%	14.3%	40.5%	23.8%	14.3%	3.24	**11th**
Management arranges adequate resources for employee training and education	16.7%	21.4%	19.0%	26.2%	16.7%	3.05	**12th**

Source: Field Survey (2019)

Results from table 4-10 revealed that majority of the respondents were indifferent to 3 variables which were management listens and acts on employee suggestions, quality policies are well communicated, quality policies and practices are reviewed routinely, this confirms the earlier observation on process and procedure manuals and other documents which were kept by

management. The respondents also agree that management empowers employees to solve quality problems and actively participate in quality activities. The most actively practices variable in relation to leadership role towards TQM was managements tabling quality issues at part of topics of discussion during management meeting with mean of 3.95 followed by management encouraging employees to partake in quality management activities. The least practice variables to measure top management commitment or leadership as a success factor in the printing industry were review of quality policies and practices with a mean of 3.24 and arrangement of adequate resources for employee training and education with a mean of 3.05. Most TQM implementation fails due to lack of proper training of staff. Training programs should be planned and adequate resources should be allocated for such purpose.

4.5.2 Customer Focus

Table 4-11: Variables relating to Customer Satisfaction in TQM implementation

Variable	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly Agree**	**Mean**	**Rank**
Our firm delivers printed products according to customer specification	4.8%	2.4%	4.8%	35.7%	52.4%	4.29	1st
Quality-related customer complaints are treated with top priority	2.4%	9.5%	9.5%	38.1%	40.5%	4.05	2nd
Our firm has been customer focus for a long time		7.1%	11.9%	50%	31%	4.05	2nd
Customers repeat business with our firm	4.8%	2.4%	11.9%	50%	31%	4.0	4th

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
Customers recommend our firm to friends	4.8%		23.8%	38.1%	33.3%	3.95	5th
There is data to measure customer satisfaction	11.9%	21.4%	45.2%	7.1%	14.3%	2.9	6th
Our firm organizes customer satisfaction survey every year	3.8%	28.6%	31.0%	11.9%	4.8%	2.45	7th

Source: Field Survey (2019)

Data from table 4-11 above reveals that 52.4 per cent of the respondents strongly agreed their firm delivers printed products according to the customer specification. This confirms earlier assertion by Graham et all (2015) that quality management is tailored towards the needs of the customers as customers define the business direction of printing. 50 per cent agreed that customers repeat doing business with them, customer complaints were also handled with topmost priority with 40.5 per cent strongly agree to the statement. Topmost three variables practised towards customer satisfaction were printing and delivery of products according to customer specification with mean of 4.29, handling of customer complaints with mean of 4.05, and focusing on customers being their ultimate goals with mean of 4.05. The least practised variables to measure customer focus factor was the presence of data to measure customer satisfaction with a mean of 2.9 and organisation of survey with a mean of 2.45. There is a clear correlation between customer survey and data to measure customer satisfaction which printing firms need to improve.

4.5.3 Employee Development, Empowerment and Participation

Table 4-12: Variables relating to employee development, empowerment and participation

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
Employees are committed to the success of our firm	-	9.8%	17.1%	43.9%	29.3%	3.93	1st
Teamwork is encouraged rather than individual work	7.1%	4.8%	16.7%	42.9%	28.6%	3.81	2nd
Reporting work-related problems are encouraged	4.8%	9.5%	19.0%	42.9%	23.8%	3.71	3rd
Staff are encouraged to fix problems they find	2.4%	14.3%	23.8%	50.0%	9.5%	3.5	4th
The staff enjoys job description and working environment	7.1%	14.3%	23.8%	40.5%	14.3%	3.40	5th
Staff are actively involved in quality-related activities	-	23.8%	31%	35.7%	9.5%	3.31	6th
Staff suggestions are implemented after the evaluation	2.4%	14.3%	47.6	23.8%	11.9%	3.29	7th
Our firm trains employees on processes	9.8%%	22.0%	22.0%	36.6%	9.8%	3.15	8th

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
for improvement regularly							
Our firm have quality control circles	14.6%	22.0%	36.6%	24.4%	2.4%	2.78	9th

Source: Field Survey (2019).

As reflected from the table 4-12, the use of quality control circles is very low ranked ninth with a mean of 2.78, followed by training of employees on processes for improvement regularly with a mean of 3.15. The most widely practiced variable in employee development, empowerment and participation was commitment of employees towards the success of their organisations with mean of 3.93. 43.9 per cent of the respondents agreed that employees are committed to the success of the organisation. Teamwork encouragement within the printing industry was also high ranked as the second variable in EDEP with a mean of 3.81. 42.9 per cent also agreed teamwork being encouraged and also reporting of work-related problems are also encouraged in the printing industry. Majority of the respondents were indifferent to implementation of staff suggestion.

4.5.4 Quality System, Process Control and Improvement

Table 4-13: Variables relating to the Quality system, process control and improvement in the printing industry towards the implementation of total quality management

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
Our firm is kept clean and neat at all times	4.8%	4.8%	14.3%	31.0%	45.2%	4.07	1st

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean	Rank
There is clear clarity of processes and methods		7.3%	17.1%	41.5%	34.1%	4.02	2nd
Production Equipment is well maintained		4.9%	31.7%	39.0%	24.4%	3.83	3rd
Our firm has clear working instructions	7.3%	7.3%	12.2%	46.3%	26.8%	3.78	4th
Our processes are designed to minimize employee error	2.5%	12.5%	20.0%	45.0%	20.0%	3.68	5th
Our firm implements various inspections effectively	2.4%	17.1%	29.3%	36.6%	14.6%	3.44	6th
Our firm has a clear quality manual	9.8%	19.5%	31.7%	24.4%	14.6%	3.15	7th
Our firm uses Plan-Do-Check-Act extensively for process improvement	10.0%	20.0%	32.5%	30.0%	7.5%	3.05	8th
Our firm has clearly documented procedure and process manual	15.4%	20.5%	25.6%	20.5%	17.9%	3.05	8th
Our firm uses 7 basic quality control tools extensively for process improvement	12.8%	20.5%	35.9%	23.1%	7.7%	2.92	10th

Source: Field Survey (2019)

Results from table 4-13 confirm the low use of hard TQM elements such as the 7 basic tools of quality. Awareness level in relation to the tools of quality was very low. Training of both management and staff is the key ingredient to improve its usage since its role cannot be considered insignificant in the implementation of TQM. Most of the respondent confirmed that their firm was kept clean with a little over 45 per cent strongly concurring to the statement. During the administration of the questionnaire, only few printing firms had their factory in a disorganised manner. This is also confirmed by (Afeliga, 2017) in his studies.

4.5.5 Supplier Management

Table 4-14: Variables relating to Supplier Management towards TQM Implementation

Variable	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly Agree**	**Mean**	Rank
Our firm has established long-term cooperative relations with suppliers.	2.6%	5.1%	12.8%	48.7%	30.8%	4.0	1st
Our firm has high recognition for product quality in supplier selection		7.5%	17.5%	47.5%	27.5%	3.95	2nd
Our firm always gives feedback on the performance of suppliers' products.	2.6%	5.1%	20.5%	41.0%	30.8%	3.92	3rd
Firm maintains regular suppliers to maintain consistency	2.6%	7.9%	18.4%	39.5%	31.6%	3.89	4th

Variable	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly Agree**	**Mean**	Rank
Our firm has detailed information about supplier performance.		7.7%	28.2%	41.0%	23.1%	3.79	5th
Our firm always participates in supplier activities related to quality.	2.6%	2.6%	41%	38.5%	15.4%	3.62	6th
Our firm regularly conducts supplier quality audit.	10.3%	15.4%	38.5%	28.2%	7.7%	3.08	7th

Source: Field Survey (2019)

From table 4-14, 48.7 per cent of printing firms have a long-term relationship with their suppliers, 47.5 per cent of agreed that product policy was one of the key variables in supplier selection. The majority were indifferent to the last statement that their firm regularly conducts supplier quality audit. There is a sharp contrast between what was discovered by (Afeliga, 2017) where staff were not aware of their firm and supplier activities. In this study, most of the workers had knowledge about their organisations' relationship with suppliers. All the variables had a mean greater than 3.

4.5.6 Evaluation

Table 4-15: Variables for Evaluation principle towards TQM Implementation

Variable	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Mean
Our firm regularly conducts quality audits	12.5%	22.5%	22.5%	40.0%	2.5%	2.98
Benchmarking is used by our firm extensively	12.8%	7.7%	38.5%	30.8%	10.3%	3.18
Cost of quality is used by our firm	5.1%	7.7%	38.5%	38.5%	10.3%	3.41
Our firm has detailed quality-related data such as defect rate	15.0%	20.0%	32.5%	25.0%	7.5%	2.90
Quality-related data are used to assess management	12.5%	20.0%	40.0%	17.5%	10.0%	2.93
Quality-related data are used to evaluate the performance of all departments	15.0%	15.0%	32.5%	27.5%	10.0%	3.03
Quality-related information is displayed on the shop floor	12.5	32.5	25.0	25.0	5.0	2.78
Quality-related data are used to assess employee's performance	5.1	17.9	23.1	43.6	10.3	3.36

Source: Field Survey (2019)

From table 4-15, Half of the variables measured toward the evaluation of total quality had means less than 3. 32.5 per cent of the respondents disagreed that quality-related data are not

displayed on the shop floor. 40 per cent were indifferent as to quality-related data used to assess management. For successful implementation of total quality manager, workplace organization plays a crucial role most especially in the printing industry. This concurs with many schools of thoughts that quality improvement is done best when its attached as assessment for both management and employees. Though interaction with some production managers revealed poor documentation of quality related data, press houses should strive to improve quality by using quality data as a benchmark value year on year basis.

4.6 Barriers to Implementation of TQM

Despite the benefits achieved by some organisations after implementation of TQM, other organisations which tried to implement TQM encountered a lot of hindrances. Items on the questionnaire to gather responses on the barriers were based on literature by (Talib et al., 2011), (Bhat and Rajashekhar, 2009) and (Mohammad and Rad, 2005). Twelve barriers were identified which directly relates to the printing industry. Barriers were ranked by respondents. Friedman's test was used to analyse. The figure below presents the mean values for each item on the questionnaire in descending order by their mean. The higher the mean, the greater the level of importance of the barrier.

Table 4-16: Ranking of TQM barriers in the printing industry.

TQM Barriers	Mean Rank	Rank
Human Barriers such as low wages and salaries, fear, low skill	10.33	1st
Poor Planning	9.69	2nd
The attitude of employees towards quality	8.90	3rd
Lack of Management Commitment	8.79	4th
Poor employee development, empowerment and participation	8.74	5th
Lack of Communication	8.63	6th
Employees resistance to change	8.59	7th
Lack of Proper education and training	8.31	8th
No Benchmarking	7.89	9th
Lack of Coordination between departments	7.84	10th
Longer time for implementation	7.09	11th

TQM Barriers	Mean Rank	Rank
Inadequate Resources	6.96	12th
High Cost	6.63	13th
Lack of continuous improvement culture	6.50	14th
High Turnover at management level	5.13	15th

Source: Field Survey, (2019.)

Majority of the respondents perceived human barriers, poor planning, as the most significant barriers with means above 9, while the attitude of employees towards quality, lack of management commitment, poor employee development, empowerment and participation, lack of communication, lack of proper education and training were considered as other important barriers towards total quality management in the printing industry. The mean ranged from 5.13 – 10.33 with an overall mean of 8.00.

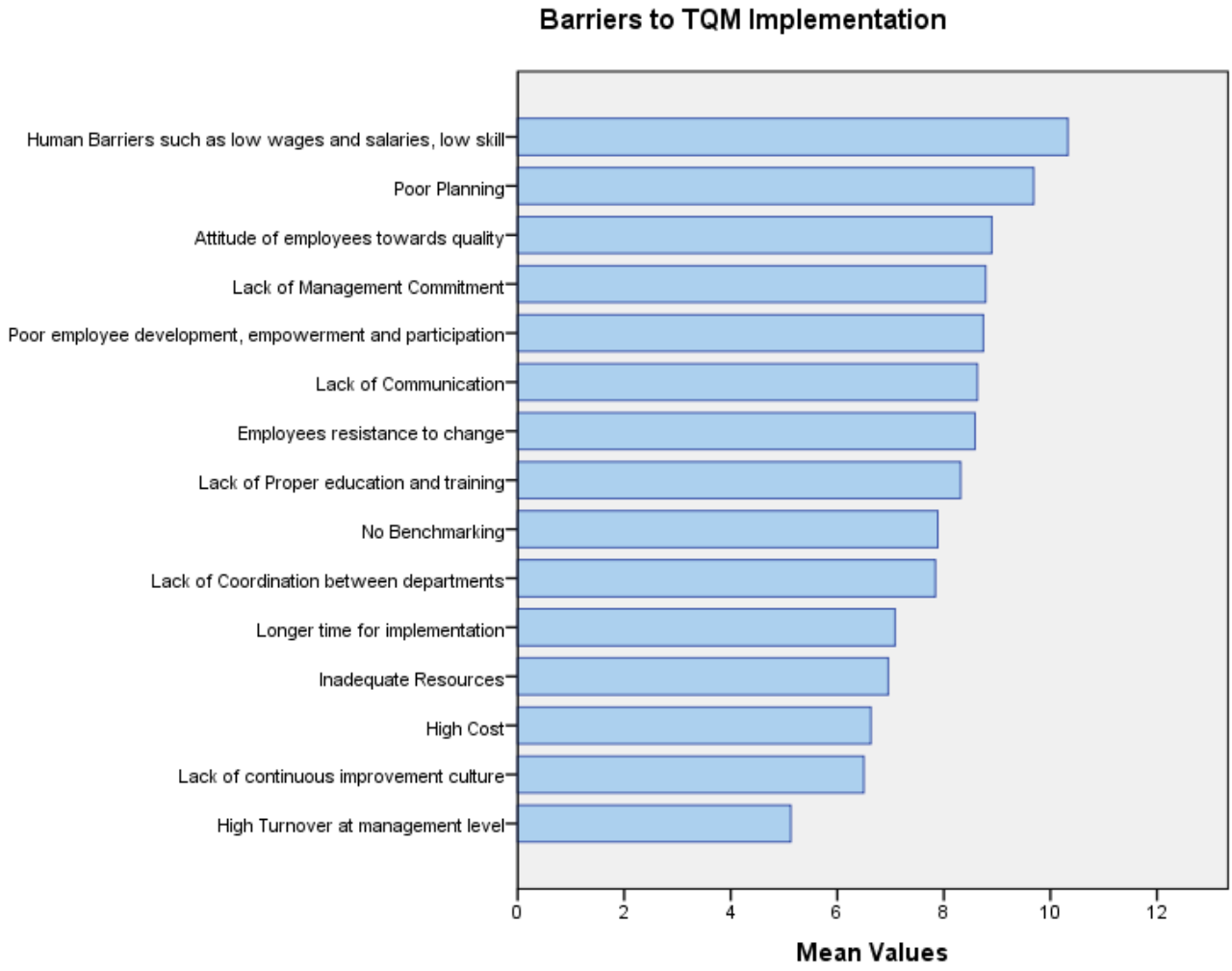

Figure 4-20: TQM Barriers in the printing industry
Source: Field Survey (2019)

In a study by (Faisal and Zillur, 2015) while lack of communication and lack of top management commitment received the top-ranked within the service sector, managers of the printing industry in Ghana should focus on the human barriers such as low wages and strong strategic planning for quality improvement prior to the implementation of quality.

Top rank of the barriers to the implementation of TQM in the Ghanaian printing industry was managerial and people related barriers. Managerial issues play a crucial role in the achievement of organisational goals and hence has a higher significance at the implementation stage. Change in thought, behaviour, attitude can help resolve these barriers (Faisal and Zillur, 2015).

Objective 3: To outline ways of implementing total quality management in the printing industry.

4.7 TQM Implementation Cycle in the Printing Industry

Several ways have been preferred by the following literature (Donevski et al., 2009), (Edu, 2006) implementation of total quality management. The implementation process on print projects is in six stages. The stages are linked towards the attainment of successful implementation of Total Quality Management

Proposed model for the implementation of Total Quality Management in the Printing Industry

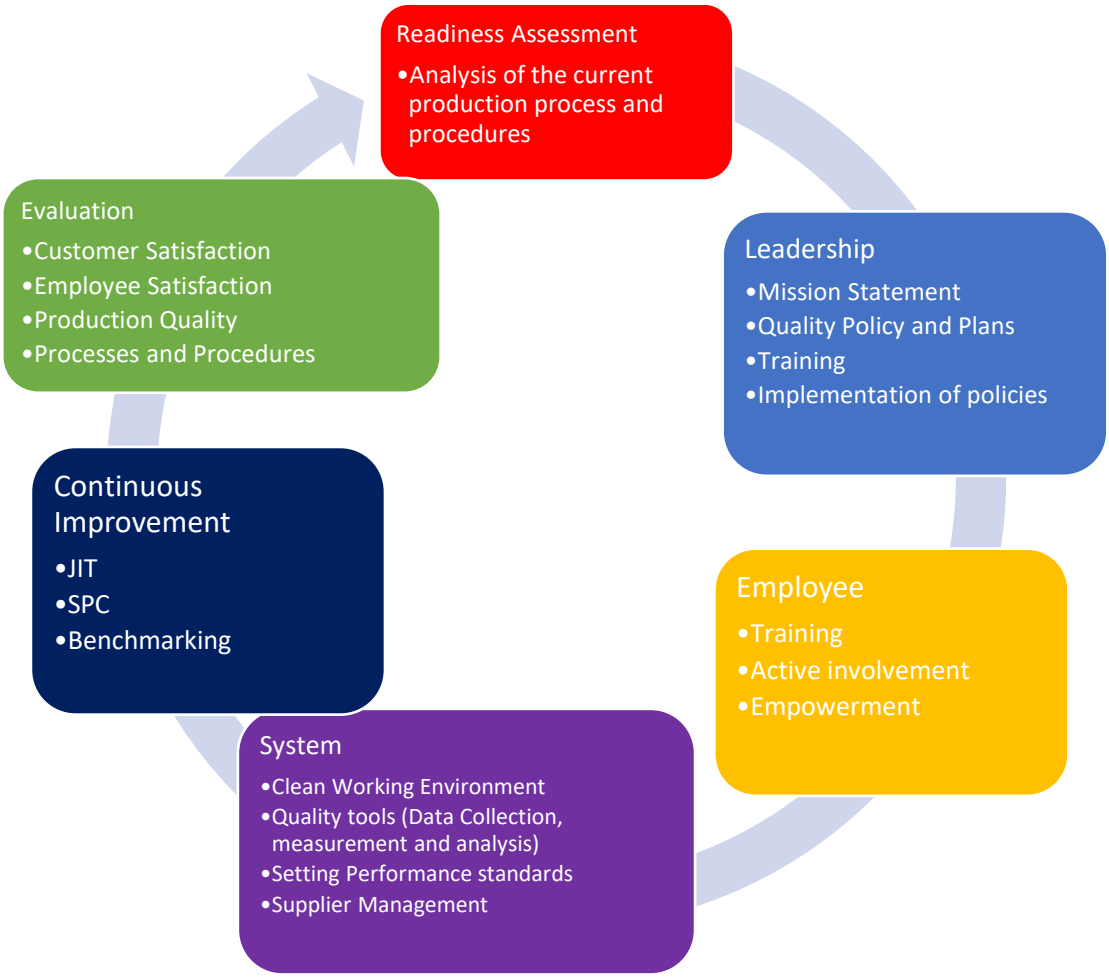

Figure 4-21: Model for implementation of Total Quality Management.
Source: Authors own concept (2019)

4.7.1 Stage 1: Readiness Assessment

This stage is concerned with clear knowledge of what can and should be expected from the introduction of TQM and its implementation. At this stage review of all the organisation's

processes and procedures, quality policy, mission and vision statement, employees' attitude towards quality, and quality culture, organisational goals. A weekly meeting involving management and employee should be done at this stage to review the entire goals. The organisation should be disaggregated into department and cause and effect diagram should be used to analyse each unit under each department role towards quality with the ultimate aim of delighting customers.

4.7.2 Stage 2: Leadership

Top management must define its philosophy. Long term and mid-term management plans should be prepared at this stage. Corporate goals definition and measures to achieve are stipulated clearly at this stage and this requires the commitment of top managers within the firm. Goals set should be deployed down to the organizational level. At this stage, active participation of the employee's leadership is required.

Quality policies should be developed or revised at this stage and the mission also revised to incorporate quality. Processes and procedures are also reviewed and copies made available to all staff within the organization.

Clear definition of roles and responsibilities are also developed at this stage. This involves the provision of detailed job description incorporating quality into it for all departmental staff. Customer satisfaction is the ultimate goal of every organization and hence procedures of dealing with customer claims should be set and creating of the system to analyse the system is very key.

4.7.3 Stage 3: Employee Development, empowerment and Participation

This is one of the most critical stages in the implementation of TQM. The first activity is to the meeting of all employees to inform of the new strategies and policies towards quality and the reason for their involvement and the end results anticipated.

Manuals containing a revised quality policy, processes and procedures, are shared among staff. Training of staff on the content of the manuals is required. Definition of jobs, responsibilities and authorities of employees are done at this stage. Strict adherence to record-keeping and feedback should be clearly be made known to all staff. Employees could be involved in making improvements by setting up a suggestion scheme or by quality control circle activities.

Training on the use of quality tools should also be done at this stage. Conferences and workshops should be organized and a speaker from other organizations where TQM has been implemented to speak on its success and failures

4.7.4 Stage 4: Systems

Workplace Cleanliness

Workspace organization has a great impact on efficiency. The first thing is towards workplace organization is disposing of items which are not needed any longer to save space, clears passageways and accident prevention and improved health. Storage systems are set up for each search and retrieval of items. The efficient inventory system is set for required quantities of raw materials, fished goods and spare parts.

Clear demarcation of work areas, non-working areas for both movement of goods and personnel. Cost-saving is important at this stage so materials such as plates for reuse should be preserved and stored well. The optimal stock level should be kept on the production floor during the execution of print projects. The use of 5s for keeping the factory clean should be adopted and staff should be encouraged to abide by the rules. Waste collection and disposal system should be set.

Safety

An accident-free environment should be encouraged. Provision of personal protective tools and clothes and checking its proper usage to reduce accidents. Provision of formal safety education and promoting safety awareness should also be done to help to avoid accidents. Facilities and equipment can be sources of danger, and safety inspections should be carried out when purchasing and renovating them. Preventive maintenance helps reduce risks. Accident records serve as a guide to prevent past accidents from reoccurring and hence should be kept strictly.

Performance Standards

Performance standards should be set and agreed between management and staff. The use of balanced scorecard and other performance appraisal systems should be communicated to all

staff and timelines for assessment should be agreed upon in relation to set standards on quality and goals. Non-performing staff should be encouraged and proper coaching should be done for such staff. Staff who also presents creative ideas towards quality improvement, cost reduction and overall improvement of organisational goals should be rewarded.

Quality Tools and Techniques

The 7 basic tools should be taught and its usage should be checked. It should be mandatory for all the units within the organisation. The use of quality circles and Deming's PDCA should also be done. Data collection and means of an analysis of collected data should be established. Adherence to working instructions should also be encouraged.

Supplier Management

Suppliers are an integral part of the successful implementation of total quality management. Failure on the part of suppliers to meet perform their duties affects organisations ability to meets customers' expectations. Recognition of product quality should play an integral role in supplier selection. Suppliers should be maintained regularly and detailed information about the supplier's performance to analyse trend should be kept. Printing firms should also take part in supplier activities towards quality improvement and regular audit should be done

4.7.5 Stage 5: Continuous Improvement

Statistical Process Control, Just-in-time manufacturing and benchmarking against other printing firms should be used extensively. Cost of quality should be used. Emphasis should be on process rather than people involved to take off blame from the individual.

The use of technology to help improve the system should be implemented. Continuous training and retraining of staff should also be implemented at this stage. Printing firms should be working towards standardization at this stage.

4.7.6 Stage 6: Evaluation

The last stage in the implementation process. This involves analyses of data received on product quality, customer satisfaction and employee satisfaction. Benefits accrued from the implementation of Total Quality Management should be shared with all stakeholders. Challenges and measures put in place to address the challenges should also be communicated. Performance of departments should also be communicated through monthly or quarterly review of the entire organisations' activities.

It is hoped that printing firms in Ghana shall be able to implement TQM in the execution of print projects in a systematic and efficient manner. In the long term, positive effects of using the model will lead the firm performance in respect of employee satisfaction, customer satisfaction, and improved product quality.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Three objectives were set for the study. They were to assess the current state of TQM on print projects in the Ghanaian printing industry. The second was to identify hindrances towards TQM implementation and finally outline ways to implement TQM in the Ghanaian Printing industry. This chapter provides a summary, conclusion and recommendations on the findings revealed in the study.

5.2 Summary of Findings

The study revealed that in the last five years all the printing firms had executed printing projects. These projects include, but not limited to, the production of government textbooks, exam questions, election materials, packaging materials within a limited period of time.

Project success has been defined within the printing industry in terms of quality, customer satisfaction, scope, timelines with less cost focus. Most printing firms had a staff strength of 100 and above, with males dominating the industry.

Total Quality Management was the quality improvement program used in print project execution, and most respondents were familiar with total quality management. Although TQM was adopted, it was done in part because most of the principles were based on soft TQM elements with little or no emphasis on hard TQM elements such as quality tools and techniques.

Supplier management was the most practiced factor of TQM success, with the least being employee development, empowerment and participation. A human barrier such as low skills, fear, low wages followed by poor planning was the number hindrance to the implementation of total quality. A framework was proposed based on the literature reviewed to serve as a guide for the printing industry to implement TQM

5.3 Conclusion

TQM is not a new system of quality management. It has been embraced and its advantages reaped in other production environments. Before execution, there are several success factors that need to be well understood.

From the research, it can be concluded that TQM has been partly adopted by the printing sector as a quality management system for managing print projects. Adequate level awareness and penetration of TQM on print projects exist. Although TQM has encountered a number of limiting factors, there are methods to implement Total Quality Management efficiently.

5.4 Recommendation

It is recommended based on the study that;

1. Printing firms should strive to implement total quality management wholly based on the model presented and measure their benefits over time.
2. Management should develop strategies to improve on how to assess their firms for improvement.
3. Management of Printing firms could place emphasis on training and retraining its employees on quality management practices, use of quality tools and techniques, data analyses and measurement and also allocate more resources towards that.
4. Management could consider imbibing technology in their operations to improve quality.
5. Printing firms could institute a reward system for quality improvement. This will boost an employee's participation in quality activities. Blaming an individual for failure should be eliminated while rewarding creative ideas after evaluation and acceptance.
6. Future research should look into the relationship between TQM and Performance of Print Firms in the printing industry.

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APPENDIX

QN:

QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT

MSc Project Management

This questionnaire is for academic purpose only. The questions asked in this questionnaire is to assist the researcher to come up with data of the state of "Total Quality Management Practices on Projects in The Ghanaian Printing Industry". All the information gathered here will be kept strictly confidential, and anonymously.

Your cooperation is much needed to facilitate the study.

Section A General Information

Please tick all that applies to your firm

Name of Organization: ……

1. **Area of Specialization**
   a. Commercial Printing [] c. Packaging Printing [] e. Other……
   b. Security Printing [] d. Digital Printing []

2. **Number of Employees**
   a. 1 – 9 [] b. 10 – 29 [] c. 30 – 99 [] d. 100+ []

3. **Which area of printing process does your firm offer services in?**
   a. Prepress [] b. Press [] c. Post Press []

4. **Your position in the firm**
   a. Chief Executive Officer []
   b. Managing Director []
   c. General Manager []
   d. Production / Operations Manager []
   e. Marketing Manager []
   f. Financial Accountant []
   g. Others…….

5. **Years in Current Position**
   a. 0 – 2 years [] b. 3 – 5 years []
   c. 6 – 9 years [] d. 10 years + []

6. **Gender**
   a. Male [] B. Female []

7. **Qualification**
   a. High School [] b. Tertiary [] c. None [] d. Other……

Section B Knowledge of Total Quality Management

8. **Has your firm handled a print project in the last 5 years?**
   a. Yes b. No
9. **If Yes, kindly indicate** …….
10. **In Executing projects which of the following quality improvement program did you adopt?**
    a. Total Quality Management []
    b. Quality Control []
    c. Quality Assurance []
    d. Inspection []
    e. Others……
11. **Which of the following do you consider for the successful execution of print projects?**
    a. Time []
    b. Scope of work (Completed) []
    c. Quality []
    d. Cost []
    e. Customer Satisfaction []
    f. Others …….
12. **Are you aware of Total Quality Management as a quality management system in the printing industry?**
    a. Yes b. No

    If no kindly skip to question 16

13. **If Yes Have you adopted it?**
    a. Yes b. No
14. **If yes, what benefits have your firm reaped?**
    ……
15. **In your view which of the following describe total quality?**
    a. Elimination of waste []
    b. High Quality Printed product []
    c. Customer Satisfaction []

d. Delivery of product on time []
e. Cost Reduction []
f. Others…….

16. Who is responsible for quality in the firm?

a. Quality Manager []
b. Production Manager []
c. Supervisors []
d. Everyone in the firm []
e. Others…….

17. How does your firm situate quality in its mission?

a. There is a standalone quality policy []
b. Quality is not captured as part of the mission statement. [ ]
c. Quality is part of the firm's mission statement []
d. None of the above []

18. Do you collect data on quality?

a. Yes [] b. No []

19. Do you measure data on quality?

a. Yes [] b. No []

20. If yes, how do you measure it?

……

21. Which of the following tools of quality does your firm use?

a. Pareto Charts [] d. Scatter Plots [] g. Histogram []
b. Check sheets [] e. Flow Chart [] h. None []
c. Cause and Effect Diagram [] f. Control Chart []

22. How does your firm solve quality problems?

a. Form a team from all departments []
b. A permanent team deals with the problem []
c. Assign an individual to solve it []
d. A senior manager solves it []
e. Other……

23. Does your firm train its staff?

a. Yes [] b. No []

If no please skip to question 28.

24. If Yes how often?

a. Once a year [] b. Twice a year []

c. Once every two years [] d. Other…… ……

25. What form of training is given to the staff?

a. On the job training []
b. Workshops []
c. Seminars []
d. Formal Training []
e. No idea []
f. Other……

26. What is the content of the training program provided to staff?

a. Job related training []
b. Quality achievement training []
c. Problem solving and prevention training []
d. Other……

27. Who attends training programs?

a. Chief Executive officer []
b. Production Manager []
c. Quality Assurance Manager []
d. Others…….

28. Does your firm have a quality policy?

a. Yes [] b. No []

29. Does your firm have a process and procedure manual? a) Yes [] b) No []

Section C Critical Success Factors for TQM Implementation

To what extent do you agree with the following statements? Please tick appropriately

1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

Leadership	1	2	3	4	5
1. Management actively participates in quality management activities					
2. Management has a clear vision for embarking on quality					
3. Management encourages employee involvement in quality management activities					
4. Management discusses quality related issues in management meeting					
5. Management empowers employees to solve quality problems					
6. Management focuses on quality rather than yields					
7. Management creates quality awareness among staff					
8. Management arranges adequate resources for employee training and education					
9. Management is supportive of Technology advancement to improve quality					
10. Management Listens and acts on employee suggestions					
11. Quality Policies are well communicated to staff					
12. Quality policies and practices are routinely reviewed and improved					

Customer Focus	1	2	3	4	5
1. Quality-related customer complaints are treated with top priority					
2. Our firm has been customer focus for a long time					
3. There is data to measure customer satisfaction					
4. Our firm organizes customer satisfaction survey every year					
5. Customers repeat business with our firm					

6. Customers recommend our firm to friends					
7. Our firm delivers printed products according to customer specification					

Employee Development, Empowerment, and Participation	1	2	3	4	5
1. Our firm trains employees on processes for improvement regularly					
2. Our firm has quality control circles					
3. Staff are encouraged to fix problems they find					
4. Staff suggestions are implemented after the evaluation					
5. Staff are actively involved in quality-related activities					
6. Teamwork is encouraged rather than individual work					
7. Staff are involved in developing quality plans and policies					
8. Employees are committed to the success of our firm					
9. The staff enjoys job description and working environment					
10. Reporting work-related problems are encouraged					

Quality System, Process control and Improvement	1	2	3	4	5
1. Our firm is kept clean and neat at all times					
2. There is clear clarity of processes and methods					
3. Production Equipment is well maintained					
4. Our firm implements various inspections effectively					
5. Our processes are designed to minimize employee error					
6. Our firm uses 7 basic quality control tools extensively for process improvement					
7. Our firm uses Plan-Do-Check-Act extensively for process improvement					

8. Our firm has clear working instructions					
9. Our firm has a clear quality manual					
10. Our firm has clearly documented procedure and process manual					

Supplier Management	1	2	3	4	5
1. Our firm has high recognition for product quality in supplier selection					
2. Firm maintains regular suppliers to maintain consistency					
3. Our firm has detailed information about supplier performance.					
4. Our firm always gives feedback on the performance of suppliers' products.					
5. Our firm has established long-term cooperative relations with suppliers.					
6. Our firm always participates in supplier activities related to quality.					
7. Our firm regularly conducts supplier quality audit.					

EVALUATION	1	2	3	4	5
1. Our firm regularly conducts quality audits					
2. Benchmarking is used by our firm extensively					
3. Cost of quality is used by our firm					
4. Our firm has detailed quality-related data such as defect rate					
5. Quality-related data are used to assess management					
6. Quality-related data are used to evaluate the performance of all departments					
7. Quality-related information is displayed on the shop floor					
8. Quality-related data are used to assess employee's performance					

Section D

The following are barriers to the implementation of Total Quality Management. **Kindly rank in order of priority 1 being Highest – 15 being lowest.**

	Hinderance to Total Quality Management	Rank
A	No Benchmarking	
B	Poor Planning	
C	Lack of Management Commitment	
D	Lack of Communication	
E	Lack of Coordination between departments	
F	Employee resistance to Change	
G	Human Barriers such as low wages and salaries, absenteeism, low skill and motivation, non-conformance to procedures, fear	
H	The attitude of Employees towards quality	
I	High Turnover at Management Level	
J	Lack of continuous improvement Culture	
K	Lack of proper Education and Training	
L	Poor employee development, empowerment and participation	
M	Inadequate resources allocated	
N	High Cost	
O	Longer time for implementation	