
# ST. MARY'S UNIVERSITY

# SCHOOL OF GRADUATE STUDIES

# MASTERS OF BUSINESS ADMINISTRATION IN PROJECT MANAGEMENT

Assessing the effectiveness of quality management practice in construction project

The case of (wubishet)Jekale cm consultancy

By

Eden balkew

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# ASSESSIG THE EFFECTIVNESS OF QUALITY MANAGEMENT PRACTICE IN CONSTRUCTION PROJECT THE CASE OF (WUBISHET) JEKALE CONSTRUCTION MANAGEMENT CONSULTANCY

BY

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**APPROVED BY BOARD OF EXAMINERS**

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List of abbreviations and acrimony’s

| | |
|---|---|
| ASCE | American society of civil engineers |
| EBCS | Ethiopian Building Code Standard |
| ISO | international organization for standardization |
| JCMC | jekale construction management consultancy |
| PMBOK | Project Management Body of Knowledge |
| PMI | Project Management Institute |
| QA | quality assurance |
| QC | quality control |
| QMS | Quality Management System |
| SPSS | Statistical Package for Social Sciences |
| TQM | Total quality management |
| PDCA | Plan-Do-Check-Act |

# Contents

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*Abstract*

*The paper focuses on assessing the effectiveness of quality management practices in construction projects, specifically in the case of (Wubishet) Jekale CM Consultancy. Quality management in construction consultancy include client satisfaction and risk reduction through early problem identification and corrective action. The study utilized a descriptive survey method with both qualitative and quantitative approaches to collect data from 43 respondents. Both primary and secondary data were used to interpret the results. The data gathered by Questionnaires and interviews. Census was used to select the respondents since the total populations were selected as the respondents of this study. The collected quantitative data were analysed in frequency to give the meaningful conclusion for the data that collected through questioners. The qualitative data that were collected through document review were discussed in text explanation. . The research finding indicated that most respondents were familiar with the concepts of quality and quality management and its impact on any project. And how effective are the current QA/QC method in identifying and preventing defects. Other authors also pointed out that most of the obstacles to the application of quality management practices are lack of information and guideline in the area. Further to this, different factors affecting quality management technique were explained for managing the success of quality management practice. The final chapter summarizes major findings, presents conclusions, and provides recommendations based on the study's results*

*Keywords: Quality, total Quality management, construction Quality management elements,*

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Project Management Institute (PMI) defines a project as 'a temporary endeavour undertaken to create a unique product, service, or result.' In addition, it defines project management as the consumption of knowledge, tools, skills and techniques for project activities so as to meet the requirements of the project (PMI, 2013).

According to (Rosli, 2017)the project is concerned with defining and selecting a task which will be of overall benefit to the company. This benefit may be financial, marketing or technical, but this will tend to be of a long-term nature, oriented towards the expected total life span of the completed project. In contrast, project management is orientated towards planning and control

Quality has been defined as: Fitness for the intended use. (juran), whichis a utility value concept, which varies from one customer to another. According to W.E Deming quality is all about reducing variation—precision and accuracy of production. Efforts to control Quality have developed over time. This originated in the manufacturing industry, because most manufacturers inspected their products. This later led to quality control, and then to the development of Quality absorbance and Quality management.

The construction project has increased rapidly in the recent years, reflecting the interest of private and public sector investing more funds into development in developing countries like Ethiopia. Moreover attention is given to basic social sector infrastructure in public sectors particularly Health, Education, Water and other projects. Now quality management has become an integral part of construction projects (Birhanu, 2011). Quality management in construction involves putting the policies, processes, and procedures to improve the approaches and methods to deliver the aimed quality and match the required standards for any company. This includes the main parts of quality management process which are quality planning, quality assurance and quality control.

Quality planning is a process that quality departments, quality managers, and quality professionals undertake in their organizations to identify the quality initiatives to manage quality today and into the future.

AASHTO and the FHWA subscribe to definitions that designate “quality assurance” as an all-bounded term, to include “quality control”, “independent assurance” and “acceptance” as its three key components (TRB, 1999): Quality assurance is all planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily and conform to project requirement.

Quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. 150 9000: 2000 defines Quality control (QC) as “part of Quality management focused on fulfilling Quality requirements” it involves both process monitoring and eliminating the causes of un satisfactory performance at all stages focused on fulfilling product requirements.

Thus, Quality control is a process of maintaining standards prevents undesirable deviations from the planned Quality of the product being supplied. The Deming PDCA (plan, Do check Act) cycle applies to all situations and areas where Quality control is wanted. It is universal model and covers all activities relating to Quality control as well as to Quality improvements

According to (wubishet)Jekale cm consultancy project quality management guideline one of the major tasks of JCMC is Quality Assurance and control Services based on good practices to ensure contract compliance and customer satisfaction for the project under consideration on the one hand and to contribute advancement in the quality management practices on the other hand.

JCMC as a company classifies the QA/QC process into two categories namely; off-site inspections and onsite inspections. The procedures that will be categorized as off-site compliance checks are Tender/Contract, Equivalence, Manufacturer/Supplier, and Sample/Mock-up; while the procedures that will be categorized as on-site compliance checks are Parts Compatibility Compliance, Delivery Compliance, Workmanship Compliance and Performance Compliance. This includes Inputs such as Materials, Crews and Workmanships including Methods on the one hand, and components or trades of works and the final product on the other hand.

The main concern of this research is to help in preventing defects and risks that arise due to poor quality of inputs and works that may be caused by inappropriate QA/QC practices. Accordingly, it is very essential to have a Total Quality Management (TQM) system that involves all major stakeholders of the project. TQM focuses on achieving the Employer’s

quality expectations, cost effectiveness and less/no defects in the project works. A well-established quality management system will embrace the two quality management aspects namely; quality assurance and quality control. To make sure all the project works are as per the quality standards, setting up a well-established quality management guideline and applying it is very helpful. Therefore these studies were focused on the Practice of CQM activities and try to set up a well-established quality management guideline and applying it to help in preventing problems and risks that arise with poor quality of works that might come up with the material, equipment and/or workmanship.

## 1.2 Statement of the problem

Repetitive quality management simply do not guarantee success in project management practice. (Yen, 2016). There are few studies made on project quality management in general in the Ethiopian context. Based on the Ethiopian Quality Award (EQA) self-assessment model, quality management practice in Ethiopian manufacturing and service industries was found to be challenging and full of competitiveness. (bishaw and Kitaw,( 2014). Despite widespread implementation of quality assurance (QA) and control practices in construction projects, inconsistencies, inefficiencies, and non-compliance persist, leading to unsatisfactory outcomes and significant consequences.

(Long, Jha, and Iyer (,2004) remarked that quality problems arise in large construction projects due to incompetent designers/contractors, poor estimation and change management, social and technological issues, site related issues and improper techniques and tools. Identified project performance categories such as people, cost, time, quality, safety and health, environment, client satisfaction, and communication (Cheung,(2004).

The study by (Long, Jha, and Iyer ,(2004) identified success and failure attributes impacting quality in construction projects. Success attributes like 'positive attitude of project manager and participants' were crucial for quality compliance, emphasizing the importance of the human element in achieving quality but also underscore the essential role of human factors in quality outcomes in construction projects.

Projects in developing countries are highly influenced by their external environment. [ (Kuruoglu & E.Ergen), (Jekale,( 2004)]. Generally, as (Ofori, 2006 and Jekale, (2004)] concluded, the construction industry in developing countries failed to meet expectations of governments, clients and society In addition, there are other indicators of quality construction

projects in Which can be ineffectively designed QA plans, insufficient resource allocation, and inconsistent adherence to established procedures contribute to non-conformances refers to quality assurance, and inadequate material testing, low quality Martials, improper storage and handling poor workmanship can lead to the output of bad quality control in project management in order to solve this problems having to set up a well-established quality assurance guideline to implement quality assurance and quality control (QA/QC) procedures, can be considered as a system to be applicable for all construction projects.

Furthermore, the concept of quality management is to ensure efforts to achieve the required level of quality for the product/service which are well planned and organized. From the perspective of construction projects, quality management should mean maintaining the quality of construction works at the required standard so as to obtain customers' satisfaction that would bring long term competitiveness and business survival for the companies (Abdul Rahman,( 2011)

It is noticed that there are several problems in the construction industry caused by bad quality control, and the situation seems to get worse. Projects are frequently late, over budget and suffer from poor workmanship and materials. Existing quality control methods primary based on inspections have proven inadequate in preventing these defects this research aims to investigate the effectiveness of implementing lean construction principles, such as west reduction and continuous improvement, to improve defect prevention and enhance overall quality management in the construction industry Thus, the aim of this paper is to assess the construction quality management process in (wubshet jekale) CM consultancy company on abay bank headquarter building.

## 1.3. Research Questions

The specific questions this study will address

I. What is the level of project quality management success in the case of (wubishet) Jekale CM consultancy
II. To what extent dose the current QA/QC techniques is effective identifying and preventing defects at different stages of construction level in (wubishet) Jekale CM consultancy.

III. What are the main objectives of using quality assurance and quality control to ensure quality in construction project (wubishet) Jekale CM consultancy?

## 1.4 Research objectives

a. General Objective

The general objective of this paper is to assess the effectiveness of project quality management practice in construction project in the case of(wubishet) Jekale CM consultancy on abay bank head quarter building project.

b. Specific Objectives

The specific objectives of this study are: -

- To evaluate the level of project quality control method
- T assess the level of project quality assurance method.
- To assess the level of project quality management success in construction

## 1.5 scope of the study

The scope covers the effectiveness of quality management in construction project at ( wubishet) jekale construction management consultancy focusing on abay bank head quarter building project. Only fixated on the consultant side which can address the quality management practice in the construction industry For the last five years (2019-2024) and give recommendation for further improvements. Generally this study had focused on quality management elements, factor affecting quality managements and quality management measurements. Thereby identifying the foundation of achieving construction project quality management in ( wubishet) jekale cm consultancy projects.

## 1.6 limitation of the study

. This study is limited to Project managers, resident engineer, senior officers and other relevant individual working for (wubishet) Jekale CM consultancy while in project implementation contractors and beneficiaries (the community) among others are included. due to the limited financial capacity and shortage of time.

## 1.6 Significance of the study

This study have great importance for construction project quality management it holds significant value for various stakeholders within the industry and have a good impact to the existing project quality management literatures. Also, this research indicates where future researches in project quality management could look towards in fully understanding this widely practiced discipline.

## 1.7 definition of terms

**Construction** _ is the clearing, dredging, excavating, and grading of land and all other activities associated with putting up of buildings, structures or other types of real property such as bridges and dams or roads

**Consultant** _ in this study the consultants are quantity surveyors, Architects, Engineers and technicians who are involved professionally in construction of projects.

**Construction project** _ this are projects involves building or constructing of infrastructures.

**Factors** are a condition that causes a result or the one of element.

**Measurements**_ this are play a vital role in ensuring a building is constructed correctly and safely

**Quality** is fitness for use or a degree of excellence.

**Quality management**_ overseeing activities and tasks to ensure a consistent level of excellence in an organization's products or services.

**Quality control**_ a system of management that ensures that deliverables meet the standards and guidelines set by the client at the beginning of the construction process

**Quality assurance**_ Quality assurance (QA) is any systematic process of determining whether a product or service meets specified requirements

**Total quality management**_ is a theory of management the purpose of which is to improve an organization ability to deliver quality to its customer on a continuously improving basis.

## 1.8 Organization of the study

The study was organized in to five chapters. Chapter one contains the background of the study, statement of the problem and purpose of the study. This was followed by the research objectives, research questions, and scope of study, limitation of study, significance of the study and definition of terms and concludes with the organization of the study. Chapter two covered the literature review from various sources to establish work done by other researchers, their findings, conclusions and identification of knowledge gaps which forms the basis of setting objectives and research questions of the study. The theoretical and conceptual frameworks were also explained. Chapter three covered the research design, target population of the study, sample size and sampling procedures. This was followed by data collection procedures, data collection instruments, validity of the instruments, reliability of instruments, data analysis techniques, and concluded by ethical considerations. Chapter four covered the findings form data analysis, presentation of findings and interpretation of findings. It concluded with the summery of the chapter. Chapter five covered the summary of findings, discussions, conclusions and recommendations of the study. It was concluded with suggested areas for further research and contribution to the body of knowledge

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

This chapter is composed of two sections, which are Theoretical and Empirical. Under theoretical definition of terms are and related literatures are given and the empirical literature the reviews of previous related literatures on construction project quality management and quality management elements on construction.

### 2.1 Theoretical literature review

**A project:** is a unique set of coordinated activities with definite starting and finishing point, which is undertaking by individuals or organizations to meet specific objectives within defined schedule, cost, and performance parameters (Heagney, (2012). It is also defined as a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specifications (Wysocki, (2014). It should have definite starting and ending points since it is a temporary activity, a budget, a clearly defined scope or magnitude of work to be done, and specific performance requirements that must be met. The PMI definition shows that a project is a temporary endeavour undertaken to produce a unique product, service, or result (PMI, (2013).

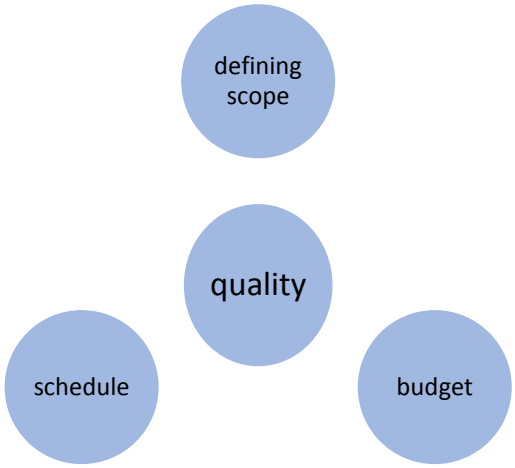
Also, according to the PMBOK (Project Management Body of Knowledge) 3rd edition, a project is an activity to meet the creation of a unique product or service and thus activities that are undertaken to accomplish routine activities cannot be considered projects. According to these definitions a project can be defined as it is a set of multiple activities having only one goal and it is done only once delivering unique outcome. It is distinguished from regular work in that it's a one-time effort to change things in some way.

### 2.2.1 Project quality management

The definition of project quality management can be seen in different ways through different literatures. According toPM4DVE project quality management book Quality management is the process for ensuring that all project activities necessary to design, plan and implement a project are effective and efficient with respect to the purpose of the objective and its performance. The book also stated that there is a different source for definition of quality one is quality comes from the donor and another source for quality definition comes from the beneficiaries. As stated in to an ASCE study, quality can be distinguished as follows.

- Meeting the requirement of the owner as to functional adequacy completion on time and within budget lifecycle costs; and operation and maintenance
- Meeting the requirements of the design professional as to provision of well-defined scope of work; budget to assemble and use a qualified, trained and experienced staff; budget to obtain adequate field informat0ion prior to design; provisions for timely decisions by owner and design professional; and contract to perform necessary work at a fair fee with adequate time allowance.
- Meeting the requirement of regulatory agencies (the public) as to public safeties and health environmental considerations, protection of public property including utilities, and conformance with applicable laws, regulations, codes and policies.
- Meeting the requirements of the constructor as to provision of contract plans, specifications, and other documents prepared in sufficient detail to permit the constructor to prepare priced proposal or competitive bid; timely decisions by the owner and design professional on authorization and processing of change orders; fair and timely interpretation of contract requirements from field design and inspection staff; and contract for performance of work on a reasonable schedule which permits a reasonable profit.

  A book by abdul razzak stated the quality of construction project can be defined as the following: construction project quality is the fulfilment of the owners needs per defined scope of works within a budget and specified schedule to satisfy the owners' requirement. The phenomena of the three components can be called the construction project theriology.




Construction project theriology

Quality management system in construction a book by Abdul Hakim bin Mohammed and Dan Mat Naim bin Abdullah stated the gap with quality management system in project level and stated that it rather focused on only quality management system at the organization level. This research also includes some obstacles implementing of the iso 9000 by quoting Low and Goh, (1994); Wan Yusoff et al, (1994 ;) Oakland and Aldridge, (1995); McCabe, 1996 Low and Hennie,

(199)7; Giles, 1997; Abdul-Aziz and Tewfik, (1999) studies. These obstacles are resistance to change; misconception of the ISO 9000 quality system; quality perceived as something secondary to the business and other obstacles where stated.
(Chandrasena (2010) stets the implementing concepts of quality management in construction project require the identification of quality standards (quality planning), the evaluation of overall project performance (quality assurance), and the monitoring of specific project results (quality control)

### *2.1.2 Project quality planning*

Quality planning is a process that quality departments, quality managers, and quality professionals undertake in their organizations to identify the quality initiatives to manage quality today and into the future. A quality plan is a document, or several documents, that together specify quality standards, practices, resources, specifications, and the sequence of

activities relevant to the delivery of a construction project. According to (juran) quality does not happen by accident, it must be planned

(Juran) also stated Quality planning is designing a process that achieves required goals – this requires determining goals, undertaking resource planning, planning implementation and creating a quality plan

Tim Howarth and David greenwood quote from jurans quality management theory's and found Quality planning functions at two levels. At the senior management level, this is their responsibility to ensure that the following take place.

• The planning of the quality management system;

• The achievement of continual improvement; and

• The setting of quality objectives.

At a lower level the organisation's quality documentation in relation to planning for the understanding of quality management processes is compulsory. The format of the quality plan is optional and quality plans only need to be as complex as the product or service demands.

### 2.1.3 Project quality assurance and control

Construction quality assurance and control play a vital role in ensuring the overall quality and longevity of buildings and construction projects (kuleshov,(2020).Without proper quality management operations, there can be significant losses in terms of time, money, materials, and resources(vesela & synek,(2019.)

Construction quality assurance and control are crucial aspects of the construction industry, as they contribute to the overall success of projects. These practices involve the implementation of a quality management system, which includes the managing structure, responsibilities, methodology, processes, and management resources needed to achieve the organization's quality objectives (Othman(,2018) Quality assurance in construction encompasses various aspects, such as the quality of materials, workmanship, and the fulfillment of end users' ultimate requirements (Huo,(2020)

Quality assurance is all planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily and conform to

project requirement. TRB Circular E-C037 (April (2002) defines Quality Assurance as "All those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service." More simply stated, Quality Assurance can be defined as "Making sure the Quality of a product is what it should be."

Research by (Salvi1 ,and. Kerka) explain about Quality Assurance and Quality Control for Project Effectiveness in Construction and Management. It also defines quality assurance and control as conformance to requirements or specifications, fitness to be used, and the degree to which inherent characteristics fulfil requirements. Quality control ensures that work is of the required quality and durability through inspections and verifications of materials and construction processes

The research States that the main quality assurance concepts include the importance of embracing quality assurance to reduce costs and improve project effectiveness in the construction industry. Quality assurance and quality control are crucial for maintaining uniformity in the construction process and ensuring more economical utilization of materials, leading to a significant reduction in costs for users.

### 2.1.4 Total quality management

TQM is a comprehensive approach to managing quality. It focuses on continuous improvement in all aspects of an organization, from planning and design to production and delivery. Total quality management is not individual concept it is a number of related concepts pulled together to create a comprehensive to doing businesses (geotsche & davic(2003) The success of a TQM program first of all depends on management practices. TQM is a culture and philosophy that must permeate an organization as the method of management. It can thrive only under a senior management that establishes TQM as a top priority. This commitment must be coupled with a thorough understanding of TQM.

(Arditi and H Gunaydin) also illustrated the Elements of total quality management (TQM) in the construction process work which helps to create a culture of continuous improvement, aiming to deliver projects that are on time, within budget, and meet or exceed customer expectations. Here are some key elements of TQM in construction:


Elements of total quality management in the construction process

Implementing Total Quality Management involves various aspects of quality assurance and quality control. This includes monitoring laboratory and field testing of construction materials, reviewing contractor compliance with specifications, and maintaining quality assurance manuals. Additionally, administrative functions such as initiating design changes and documenting project related tests and inspections are also important in maintaining quality control. The implementation of Total Quality Management in the construction industry has shown positive impacts on construction companies (Hernandez &aspinwall (2008) these impacts include improved customer satisfaction, increased market share, and repeat business. Various factors have been identified as critical for the success of Total Quality Management in construction projects. These factors include organization effectiveness, the performance of project managers, human factors, alignment of organizational strategy with project targets, and senior executive support

### 2.1.5 Barriers to Total Quality Management in Construction

Some of the barriers to implementing Total Quality Management in the construction industry include resistance to change, lack of leadership support, inadequate training and education on quality management practices, lack of communication and collaboration among project

stakeholders, and a traditional culture that prioritizes speed and cost over quality (hoonakker 2010)

TQM holds potential benefits for the construction industry during contraction periods. Its focus on efficiency, communication, and continuous improvement aligns with the critical needs of navigating challenging economic situations. However, successful implementation requires a nuanced approach that addresses specific challenges and limitations to achieve optimal outcomes. Further empirical research is needed to understand and quantify the long-term impacts of TQM in contraction contexts.

## 2.2 Empirical literature review

Project quality management must address both the management of the project and the product of the project. Failure to meet quality requirements in either dimension can have serious consequences for any or all the project stakeholders (PMI, 2000). Quality is a desirable characteristic by all stakeholders in construction. (khan, azhar, 2008) the paper also provides a comprehensive overview of implementation of a project quality management system within the context of a large scale construction project in Pakistan. the researcher uses on site QA/QC tasks which are audits of the quality assurance program of the organizations involved in the construction and operation of the facility, review of the procedure and specified standards, performance of onsite covering non-destructive testing and visual testing, monitoring and maintenance and the offsite QA/QC tasks are assisting in defining quality, program review of design, inspection, witnessing or verification of any actions undertaken during manufacturing to establish the quality of materials The quality assurance (QA) is a set of activities whose purpose is to demonstrate that an entity meets all quality requirements (ISO, 2007).Construction quality management is a key aspect of the construction process which aims to ensure the projects are carried out consistently and according to established standards. It involves implementing quality assurance and quality control systems throughout the entire project lifecycle to achieve high-quality outcomes. Quality assurance and control are essential components of any successful project or process (mcconkey, 2013). Quality assurance focuses on preventing defects and errors before they occur, while quality control involves monitoring and inspecting the process or product to identify any issues or deviations from the desired quality standards The methodology in quality assurance involves a series of steps and actions that are followed to ensure the desired level of quality is achieved (Sarkar,

(2017).These steps can including Defining quality objectives and requirements A book by (Arditi and Gunaydin ) about quality control and assurance in construction Discusses the importance of quality control and quality assurance in ensuring the successful completion of construction projects It also highlights the use of Quality Function Deployment (QFD) as a management tool to benefit project managers by ensuring that design fulfils user requirements and quality control/assurance procedures are correctly administered. ( Dr. J. Bhattacharjee) also stated the means to determine the quality of building construction materials, describe the quality program and organization, provide guidelines for inspection and documentation of construction activities, and ensure that unexpected changes or conditions affecting construction quality are detected and addressed. Implementing ISO 9000 standards can facilitate the implementation of quality management and quality assurance systems in construction projects. ISO 9000 provides a guideline for selecting the appropriate standard from ISO 9001 and 9002, depending on whether the organization focuses on design.

(salvi 2020) discusses the importance of quality assurance and quality control in the construction industry. The article emphasizes the need for building owners to understand and advocate for quality assurance to protect their investments and reduce construction costs. The document also covers the implementation of quality assurance and quality control in the construction sector, including the role of ISO-9000 standards. It highlights the significance of quality control in ensuring that the end result of construction conforms to prescribed specifications and meets the owner's requirements. The study aims to identify prerequisites for QA and QC, understand QA and QC specifications, and develop checklists for onsite inspection. a research on construction quality control measures of key construction works by (peng, li, , hong Ru cai) Evaluation of the quality of the construction work is part of the project quality control, the only objective way to evaluate the quality of the project in order to better control the quality of the project evaluation method is highly subjective and therefore cannot be the quality of project to make an objective and impartial evaluation, therefore construction key parts of quality control method and measures need to constantly sum up experience especially for the quality control of key part of the construction work.

an article about Exploration of Engineering Supervision Quality Control Under Uncertain Model by (Xu, 2020) express the construction quality control process as a systematic approach used to ensure that construction projects meet specified quality standards and requirements. It involves various steps such as Planning and setting quality objectives: This

involves identifying the quality requirements for the project and developing a plan to meet these objectives Executing the quality plan: This includes implementing and monitoring quality control measures during the construction process, such as conducting inspections, tests, and audits.The paper involves determining the quality of required building construction materials and testing them to meet specified requirements, as well as highlighting the importance of quality control and quality assurance in ensuring the successful completion of construction projects. The study aims to reduce risk, avoid construction problems, and satisfy the conditions of buildings, with a focus on quality program and organization, inspection and documentation of construction activities, and addressing unexpected changes affecting construction quality

**. Factor affecting construction quality management**

Construction quality can affect the whole project scope and objectives. Among the most common factors which affect the construction quality managements system are the use of damaged and low-quality materials, supplier, subcontracting, failure to document changes, scope creep, miscommunications between teams and complexity of design. Zidan (2013) briefs his research on factors affecting design quality in construction. And stated that Poor design is the main factor that reduces the overall performance of the construction project. Which includes insufficient overall design time, method of selecting the designer, lowest price offer, lack of documentation and changes in client requirements. A study conducted in Gaza by (Mahamid ) found that the most significant factors affecting design quality in construction projects are poor skills of consultant's staff, lack of time allowed for checking of design documents, lack of experience, unfamiliarity of designers with construction techniques used in the project and absence of good design manager. Research by Aswan**.** Al-Dalaeen explain the most important element of these factors are the lack of quality measurement methods**.** A research by (Jha, and Iyer (,2004). Discusses the critical factors affecting quality performance in construction projects. It highlights the importance of achieving quality in projects despite the focus on schedule and cost compliance. Factors like top management support and interaction among project participants are crucial for achieving good quality. The study emphasizes the role of management over the workforce in achieving quality and the significance of team effort in project quality. Factor analysis was used to identify common properties among success and failure attributes, leading to the extraction of success factors related to project manager's competence and team coordination for achieving desired quality levels. This paper main

variables include project manager's competence, top management support, interaction between project participants, owner's competence, and monitoring and feedback by project participants as factors contributing positively to achieving desired quality levels. On the other hand, factors like conflict among project participants, hostile socio-economic and climatic conditions, ignorance and lack of knowledge, specific project factors, and aggressive competition at the tender stage are identified as negatively affecting quality performance in construction projects

- **Quality measurement techniques**

Quality measurement techniques are approaches that enable the application of quality measurement tools to projects and the interpretation of results. In the construction industry ensuring quality is crucial for the successful completion of projects. Projects within specified constraints to measure the quality of construction projects various methods can be applied. Including the use of performance indictors and intervals which allows for continuous measurement and evaluation. There have been many attempts to adopt quality management as a tool for continuous improvement. Which include Six-Sigma which has already been proven to be very useful for fostering quality innovation in the manufacturing industry. But Song1, Lee2, Park suggested only using these kinds of efforts are not sufficient enough to achieve organizational goals in quality management. It is essential to also take into consideration the root causes of inefficiency in the quality management. The study suggests a data-based quality management as a solution to the foregoing problems and discusses the methods of measuring and analysing the performance related to quality in a construction company. It also establishes the quality indicators to measure quality performance objectively. The researcher also quote Cheung (2004) for establishing the quality indicators to measure quality performance which are stated below in the table

Table 1. Quality-related indicators (Cheung (2004)

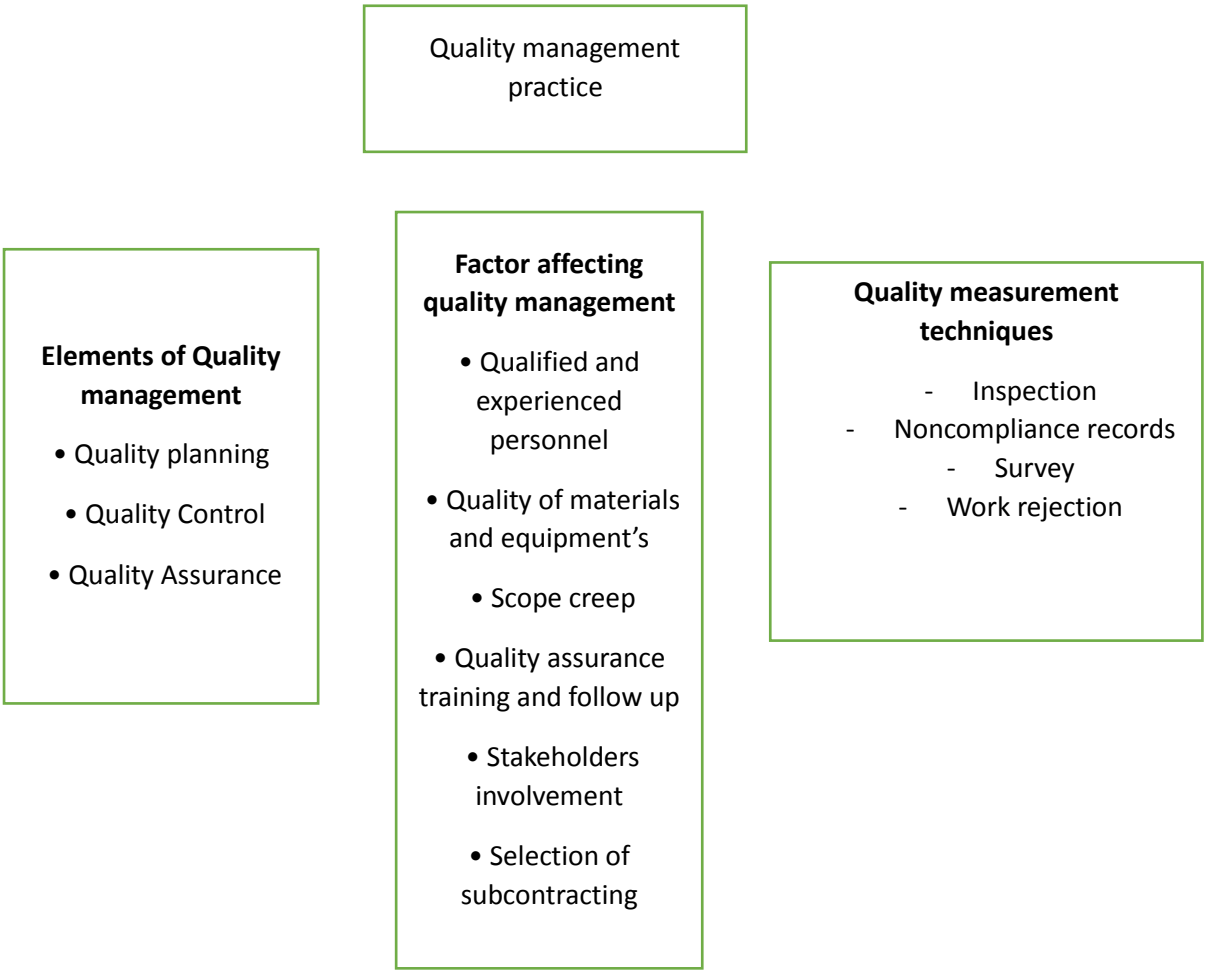
| Category | Performance indicators |
|---|---|
| Inspections | ● Number of site inspections conducted |
| Non-Compliance Records | Number of non-compliance records received<br>Number of non-compliance records closed<br>Total number of non-compliance records rectified<br>Average time to close out non-compliance records |

| | |
|---|---|
| Work Rejection | Due to workmanship<br>Due to lateness |
| Survey (Samples)Rejection | • Due to workmanship<br>• Due to lateness |

In near future, quality management will be more critical issue. Thus, it is very necessary to identify the quality standards and the effective factors'

## 2.3 conceptual frame work

The conceptual framework of a study acts as a foundation, outlining the key variables, their relationships, and the underlying theories that guide the research. The conceptual framework of the study is to assess the elements of Project quality management process and then followed by examination of major areas of project quality factors affecting quality management practice and quality measurement techniques. The following figure shows the details of the conceptual framework:



# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1 Introduction

The study aims to reflect on construction project quality management in wubishet jekale CM consultancy by looking in depth in to abaybank head quarter building. This part describes the research motivation, research design, Sampling design, Source of Data, Instrument of data collection, methods of data analysis. Validity, reliability and Ethical considerations are also described in this chapter.

The motives of this research is to assess construction project quality management and to what extent the company apply the project quality management elements in the projects in order to identify the successfully implemented quality management plans and give recommendations for the benefit of the company

### 3.1.1 Research Design

The study is time bound hence cross sectional. It is a descriptive approach this design allows the researcher to examine and describe construction project quality management. The design is selected in order to collect enough information from involved parties so as to assess and understand the quality management process in project management success.

### 3.1.2 Research approach

Mixed method is the preferred research approach, as it is claimed to balance the benefits of both qualitative and quantitative research (Creswell, 2014) and allows the researcher to utilize the benefits of a questionnaire's ability to extract specific data needed and an interview's openness in giving the respondent to have their say. With that being said this study use both quantitative and qualitative approach.

### 3.1.3Population and Sampling Procedure

#### *3.1.3.1Target population*

The target population for this study are project managers, resident engineers and project teams of abay bank head quarter building project; for the evident reason that they are the ones

at the front line, executing the project. Hence this project can help to gain a better opportunity and explore since it is a big project for the company and relevant with the research goals.

### *3.1.3.2 Sample size*

The target population for this study was 50 which includes senior project management officers, and project teams working for the abay bank project. Census sampling method were used since the population size is small and it is easy gathering data from every single member of a population. The researcher believed that taking the project managers and the team members as a sample would provide the necessary information regarding project quality management practice of the case under survey. In addition senior managements of the company and the infrastructure department are the responsible body for managing the 3 main quality management elements and they also have deeper information than the fellow quality assurance expert's members on the project management practice of the company

## 3.2.1Sampling technique

The sampling design for this project work is  Census sampling method the reason behind for using Census sampling method is the population size of the company at (wubishet)jekale CM consultancy is small and it is easy gathering data from every single member of a population.

## 3.3.1Sources of Data

To collect all necessary information for the research, both primary and secondary data sources were used. To collect relevant primary data for the study, questionnaire and interview were conducted as an instrument of data collection. The questionnaires were administered to a sample of office and project managers who are selected from the projects being undertaken currently by abay bank head quarter building project. And interview were design to help the researcher to get constructive feedback. In addition, review of relevant documents; personal observation of the projects' working environment will be carried out.

## 3.3.2 Data Collection

The survey method was chosen by the researcher because of its popularity as a means of gathering much data in cost-effective way (Sunders, 2009). Therefore, semi-structured interview and questionnaires were administrated as survey instruments to the project managers of consultants. The main tools used to gather the primary data from the primary

sources mainly include questionnaire, interview guides and experiences of the researcher. Regarding the questionnaire; primary data were collected using self-administered semi-structure questionnaire composed of close-ended and open-ended questions. Secondary data were collected through a detailed literature reviews including PQM books, some scientific and recent project management journals, thesis works and other related topics from library and internet to help access and analyse the existing data and provide a context or a different angle to support the primary data.

### *3.3.3 Validity and reliability*

## Validity

The researcher checked the validity of questioners developed for this study. Before distributing the final questionnaires to the respondents, it was be checked and commented by friends and project personnel and the advisor of the researcher and pilots done to check the valid. The final version of the questioners was distributed after incorporating all the comments and feedbacks obtained from different professionals.

## Reliability

Reliability analysis was carried out for all items for internal consistency with regard to respondent's data on project quality management rating using Cronbach's alpha and in principle Cronbach's alpha of 0.7 is acceptable for internal consistency of data obtained from respondents. It is expressed as a number between 0 and 1 where the higher the score of Cronbach alpha, the more reliable the generated scale when the closer the alpha coefficient is to 1.0, the grater the internal consistency and the reverse is true. Therefore, the reliability is checked based on the data process on SPSS

*Table 2 reliability analysis*

| Cronbach's Alpha | N of Items |
|---|---|
| .763 | 43 |

## 3.4 Data Analysis Method

The data obtained from the questionnaire respondents used to assess the construction project quality management of (wubishet)jekale CM consultancy are analysed by using descriptive analysis method. After collecting all required data using the above mentioned instruments from the identified sources, both qualitative and quantitative methods of data analyses were applied. The data obtained from the questionnaire respondents used to assess the quality management practices and challenges where analysed using SPSS After organizing, coding, and defining variables, responses of the cases were entered into the software.

## 3.5 Ethical consideration

Research ethics is broadly referred to as the appropriateness of researchers' behaviour in connection with the rights of those who are the subjects of the research project (Saunders 2009).

The purpose of the research was thoroughly explained to the company and been declared that all participants were voluntary participate in the data collection process by collaborating in filling of the questionnaire. By doing so, the respondents are free of any harm and more importantly their views were very confidential

# CHAPTER 4

# DATA PRESENTATION, ANALYSIS AND INTERPRETATION

## 4.1 Introduction

This chapter of the study asses the data gathered from questionaries' and interviews and discusses that the data collected to answer the research questions derived from objectives of the study set to achieve the research goals.

The descriptive analysis and statistical calculation was done in order to interpret raw data into useful information. Descriptive data was analysed using frequencies and percentages to find the views of the respondents on quality management practices of construction projects. The result of the analysis was presented in tables and charts.

Furthermore, this chapter detailed on the profile of the respondents and the surveyed project, the general background of the organization. The study further identified practices of construction quality management in the construction of Abay bank head quarter building project, the elements which that influences total quality of the project. The last section also assessed the challenges to quality management on projects.

## 4.2 Response rate

A total of 50 questionnaires were sent to the consultant project management office that were involved in Abay bank head quarter building project team. The respondents were professionals who were purposively selected for this study. the questioner directly focus on project staff involved at Bureau level and on the constriction sites as resident engineers who have full knowledge of the project to represent in filling questionnaires. After the data had been collected, 43 out of the targeted 50 questionnaires were responded to; therefore, 44 questionnaires were used in the analysis.

## 4.3 Analysis and Discussions on the Demographic and organizational information of respondents

### 4.3.1 Gender Composition

The demographic statistics shown in the figure below show the distribution of respondents by gender. Participants were asked to indicate their gender by selecting the appropriate option provided (male or female). Accordingly 60.5 % of the respondents were female while the

remaining 39.5 % were male. This clearly indicates that the gender computation at( wubishet) jekale cm consultancy was dominated by female respondents.

*Table 2 gender composition*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Female | 26 | 60.5 | 60.5 | 60.5 |
| | male | 17 | 39.5 | 39.5 | 100.0 |
| | Total | 43 | 100.0 | 100.0 | |

### 4.3.2 Educational Background

From the table below it can be seen that most of the respondents were with masters of degree or above. From the total sample 43 of the respondents (76.7%) were with masters of degree and above,(16.3%) were with bachelor's degree while the remaining (7%) of the respondent were college graduate. Most of the respondents were with master's degree which helps to identify and get accurate information to achieve the objectives of the study.

*Table 3 educational background*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | masters of degree or above | 33 | 76.7 | 76.7 | 76.7 |
| | bachelor's degree | 7 | 16.3 | 16.3 | 93.0 |
| | college diploma | 3 | 7.0 | 7.0 | 100.0 |
| | Total | 43 | 100.0 | 100.0 | |

### 4.3.3 Role of the respondents

. The role of the respondent of this study was 4.7% project manager 11.6% was office engineer, 11.6% was architectures, 9.3%was resident engineers, 11.6% was site engineers

and 51.1% was others which includes contract administrators , electrical engineers, hvac experts, sanitary engineers geotechnical investigators, structural engineers surveyors and quality assurance and material engineers. This means experienced consultants with the necessary expertise can help to identify and mitigate potential risks early on in the project, saving time, money, and headaches down the road.

*Table 4 role of the respondents*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | project manager | 2 | 4.7 | 4.7 | 4.7 |
| | office engineer | 5 | 11.6 | 11.6 | 16.3 |
| | Architect | 5 | 11.6 | 11.6 | 27.9 |
| | resident engineer | 4 | 9.3 | 9.3 | 37.2 |
| | site engineer | 5 | 11.6 | 11.6 | 48.8 |
| | Others | 22 | 51.2 | 51.2 | 100.0 |
| | Total | 43 | 100.0 | 100.0 | |

### 4.3.4 Client of the organization

As it was shown in the above table 67.4% of the company clients was private and 32.6% of the company's clients was corporative this shows the consultancy has more influence with the private company rather than corporate or governmental

*Table 5 client of the organization*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Private | 29 | 67.4 | 67.4 | 67.4 |
| | Corporative | 14 | 32.6 | 32.6 | 100.0 |
| | Total | 43 | 100.0 | 100.0 | |

## 4.4 project quality management practice

### 4.4.1 Quality management system

Quality management systems (QMS) have become essential components in modern organizations, providing a structured approach to ensuring consistent quality, improving processes, and meeting customer expectations. To address these expectation, the implementation of a robust Quality Management System (QMS) has emerged as a fundamental strategy for construction companies. According to the literature, one of the primary contributors to poor quality in construction projects is the prevalence of design-induced problems that often become apparent during the construction phase (Olanrewaju & Lee, 2022). The first question regarding to quality and quality management system were to define quality from their point of view and most of the respondents (67.4%) considered quality as compliance to requirements, which can ensure safety, quality, and a smooth project flow. Some areas of compliance are Building code regulation contract agreement Project Planning and Qualified Professionals. 14% of the respondents consider quality as accordance to specification, accordance to specification refers to completing the project following the exact instructions and requirements outlined in the construction specifications document. This document is a crucial part of the project and acts as the blueprint for how the construction should be carried out. The other 14% of respondents consider quality as meeting specified requirements As stated in to an ASCE study, quality can be distinguished as different kinds of quality requirements which are  Meeting the requirement of the owner as to functional adequacy completion on time and within budget lifecycle costs; and operation and maintenance or it can be Meeting the requirement of regulatory agencies (the public) as to public safeties and health environmental considerations, protection of public property including utilities, and conformance with applicable laws, regulations, codes and policies. According to the information's conducted during interviews JCMC staff considered meeting specified requirements as a mandatory during any construction work.  And only 4.7% of the respondents consider quality as customer satisfaction. To give further emphasis on the matter the researcher also conducted an interview about how quality expressed within the organization and the chosen managers implied quality  In construction, is adherence to plans and specifications, use of quality materials, and following strong workmanship practices and quality assurance . This ensures the finished product meets the owner's expectations for functionality, safety, durability, and aesthetics.

*Table 6 definition of quality*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | compliance to requirement | 29 | 67.4 | 67.4 | 67.4 |
| | accordance to specification | 6 | 14.0 | 14.0 | 81.4 |
| | meeting specified requirements | 6 | 14.0 | 14.0 | 95.3 |
| | customer satisfaction | 2 | 4.7 | 4.7 | 100.0 |
| | | | | | |
| | Total | 43 | 100.0 | 100.0 | |

On the other hand the implementation of quality management system and what kind of quality

Management system was implements within the organization were raised on the questioner. The definition of project quality management can be seen in different ways through different literatures. According toPM4DVE project quality management book Quality management is the process for ensuring that all project activities necessary to design, plan and implement a project are effective and efficient with respect to the purpose of the objective and its performance All of the respondents was aware of the organizations quality management system which implies 100% response on quality control/quality assurance to the importance of the quality management system in the (wubishet) jekale cm consultancy company

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*Table 7 implementation of quality management system*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | quality control/quality assurance | 43 | 100.0 | 100.0 | 100.0 |

### 4.4.2 Quality management system in construction

Quality management systems (QMS) have become essential components in modern organizations, providing a structured approach to ensuring consistent quality, improving processes, and meeting customer expectations.The study in this section sought information about quality management system in the construction industry. With regard to factors that affect performance of construction projects. The study interpretation of the data represented from 1-1.80 represents (strongly disagree), from 1.81-2.60 represents (disagree), from 2.61-3.40 represents (moderately agree), from 3.41- 4.20 represents (strongly agree) and from 4.21-5.00 represents (very strongly agree).

*Table 8 Quality management factor that affect performance of construction project*

| Item | N | Mean | Std. Deviation | Variance |
|---|---|---|---|---|
| Qualified and experienced personnel | 43 | 4.5 | .55 | .30 |
| Quality of materials and equipment used in the project construction | 43 | 4.3 | .67 | .45 |
| | | | | |

| | | | | |
|---|---|---|---|---|
| Conformance to specifications | 43 | 4.5 | .50 | .25 |
| Quality assurance training and follow up | 43 | 4.2 | .65 | .43 |
| Top management support | 43 | 4.0 | .88 | .78 |
| Contract documents | 43 | 4.6 | .63 | .40 |
| Selection of contractor | 43 | 4.6 | .52 | .27 |
| Co-operation of stakeholders | 43 | 4.1 | .93 | .86 |
| Valid N (listwise) | 43 | | | |

There are several quality factors within each organization which Indicate the extent to each of the following factors in quality management system at abay bank head quarter building. The first variable, qualified and experienced personnel has a mean score of 4.5 and a standard deviation of 0.55. This implies the respondent very strongly agree that, experiences personnel has a big impact on construction project quality management plan. , for the consultancy project along with utilizing these resources, you can assemble a strong team to ensure the success of your construction consultancy project. The proportionately low standard deviation indicates a consistent perception among the respondents regarding the effect of qualified and experience personnel.

The second variable is Quality of materials and equipment used in the project construction it has a mean score of 4.6 and a standard deviation of 0.67. This indicates the respondents are very strongly agree about the importance of quality of materials and equipment's. The main reason for construction material to be so influential in a construction project is because the cost for material handling may range from 30 – 80 % of total construction cost (Proverb, et al., (1999). and the relatively low standard deviation suggested that the perception of the respondents are close. Having a positive variance indicates the actual results are better than the expected results. Quality of materials and equipment has a variance of 0.3 which is positive. Thus, these finding can be useful for project industries to enhance the quality of building construction projects. The result was similar to (Aliverdi, Naeni and Salehipour, (2013) who claims that materials influence project costs and the quality of construction

The third variable is Quality assurance training and follow up with a mean score of 4.2, 0.62 standard deviation and 4.3 variance which implies the respondents are strongly agree that quality assurance training and follow-up is a major factor affecting on the effectiveness of a construction project within the organization. And Effective quality assurance (QA) hinges on

a well-trained workforce. It is a breakdown of follow-up strategies to ensure your team is equipped to deliver high-quality results. And the result of standard deviation and variance suggests the perception of quality assurance training and follow-up within the organization are close.

The fourth variable, top management support with a mean score of 4, standard deviation of 0.88 and with a0.78 of variance implies the respondents are agree that top management supports are very crucial to the project outcome. Top management support and cooperation of stakeholders are absolutely essential for the success of a construction project. It's the fuel that drives a high-performing team and ensures a project runs smoothly. And the result of standard deviation and variance suggests the perception about top management support within the organization are close

The fifth variable, contract document with a mean score of 4.6 standard deviation of 0.63 and with a0.40 of variance implies the respondents are strongly agree that contract documents are the foundation of any successful project for the company. Contract documents act as a rulebook that outlines the who, what, when, where, and why of the entire process. It can also define the scope of the project and roles and responsibility. The low standard deviation suggests a high level of agreement among the respondents on this aspect.

The sixth variable are selection of contractor with a mean score of 4.6 standard deviation of 0.52 and with a0.27 of variance implies the respondents are strongly agree that selection of qualified and experienced contractor can make the difference between a smooth, successful project and one riddled with delays, budget overruns, and quality issues. . And the result of standard deviation and variance suggests the perception about selection of qualified and experienced contractor within the organization are close.

The second item was designed to assess the quality management system plan within the organization in the surveyed abay bank head quarter building project by wubishet jekale cm consultancy. To do this, the respondents were presented with seven variables whether they consider it in their quality management plan of the project. These items are identified based on the literature from other similar projects and understanding quality management plan in construction projects, the following table summarizes the responses of the target respondents for the question If your organization implements quality management system, does your quality plan contain the following? Table below:

*Table 9 quality management plan*

| Variable | Response | Count | Percent |
|---|---|---|---|
| Responsibilities and authorities of project staff | Yes | 41 | 95.3 |
| | No | 2 | 4.7 |
| list(s) of materials and schedule of accommodation used for the project, showing the verification requirement | Yes | 34 | 79.1 |
| | No | 9 | 20.9 |
| Inspection and test plans, | Yes | 43 | 100 |
| | No | | |
| list of quality procedures and work instructions applicable to project—by making reference to the company's Quality Manual and Procedures; | Yes | 43 | 100 |
| | No | | |
| list of project-specific procedures, work instructions and inspection | Yes | 43 | 100 |
| | No | | |
| checklists, or target dates for their provision; | Yes | 43 | 100 |
| | No | | |
| Frequency of updating the quality plan. | Yes | 2 | 4.7 |
| | No | 41 | 95.3 |

The above table presents 95.3% of the respondents said that Responsibilities and authorities of project staff included in the organization quality management plan while the other 4.7% of the respondent disagree. The other point was design to understand weather the list(s) of materials and schedule of accommodation used for the project, showing the verification requirement are part of quality plan in the organization and 79.1% of the respondents said it is part of the quality management plan while 20.9% of the respondents didn't think so. 4.7% of respondents were considered Frequency of updating the quality plan is very important 95.3% thinks the other way. another points which are Inspection and test plans, list of quality procedures and work instructions applicable to project by making reference to the company's Quality Manual and Procedures; list of project-specific procedures, work instructions and inspection, and checklists, or target dates for their provision; included 100% in the organization quality plan.

A quality management plan (QMP) is a vital document in construction for Ensures project meets standards Reduces rework and costs and Improves client satisfaction. Within the construction consultancy company a quality management plan considered as a main documents to control quality. Based on the findings on the table below 4.7 % of the respondents were very low, 4.7% of the respondents were low and 32.6 % of the respondents were high and 58.1% that quality management plan is one of big factors for the susses of any construction company.

*Table 10 Importance of quality management plan*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | very low | 2 | 4.7 | 4.7 | 4.7 |
| | Low | 2 | 4.7 | 4.7 | 9.3 |
| | High | 14 | 32.6 | 32.6 | 41.9 |
| | very high | 25 | 58.1 | 58.1 | 100.0 |
| | Total | 43 | 100.0 | 100.0 | |

### 4.4.3 Quality management challenges

the research done by Beshah (2014) stated in his Fish-bone diagram, the root causes of quality problems which contributed to weak quality management practices in Ethiopia are leadership problems, lack of policy and strategy, inefficient resources management, inefficient process management, lack of customer focus and weak business performance. This variables was designed to assess the quality management challenges within the organization in the surveyed abay bank head quarter building project by (wubishet) jekale cm consultancy. To do this, the respondents were presented with eleven variables whether they consider it in their quality management challenges during the project time. These items are identified based on the literature from other similar projects and understanding quality management challenges in construction projects, the following table summarizes the responses of the target respondents for the question of challenges during the construction phase Table below:

*Table 11* quality management challenge

| | N | Mean | Std. Deviation | Variance |
|---|---|---|---|---|
| In adequate management support | 43 | 3.44 | .88 | .77 |
| Lack of quality management policy and strategy | 43 | 1.69 | 1.03 | 1.07 |

| | | | | |
|---|---|---|---|---|
| Inefficient resources management | 43 | 1.95 | 1.09 | 1.18 |
| Lack of regular supervision | 43 | 1.48 | 1.00 | 1.01 |
| Unwillingness of project staff to accept the quality management system | 43 | 1.34 | 1.11 | 1.23 |
| Lack of quality assurance team leading the process | 43 | 1.72 | 1.11 | 1.25 |
| Problems with Contractors | 43 | 4.48 | .76 | .58 |
| Lack of effective communication | 43 | 3.95 | .99 | .99 |
| Increase of cost | 43 | 3.93 | 1.38 | 1.92 |
| Unrealistic deadline | 43 | 4.06 | 1.24 | 1.54 |
| Inadequate technical skill | 43 | 4.16 | 1.15 | 1.33 |
| Valid N (listwise) | 43 | | | |

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent based on Based on the response of the respondents Mean computed on the above table. A mean (M) score of 0 to 1.5 means that In adequate management support , Inefficient resources management, Lack of regular supervision, Unwillingness of project staff to accept the quality management system, Lack of quality assurance team leading the process, Lack of quality assurance team leading the process, Lack of quality assurance team leading the process, Problems with Contractors. Lack of effective communication, Increase of cost, Unrealistic deadline and Inadequate technical skill affects quality of construction project at very low extent, between 1.50 to 2.50 means at low extent, between 2.50 to 3.50 means at moderate extent, between 3.50-4.50 means at great extent and a mean above 4.50 means in a very great extent.

Based on the findings on Table above in adequate management support with a mean score of 3.44 and standard deviation of 0.88 and with a0.77 of variance implies in adequate management support affects quality at moderate extent that can lead to a domino effect of problems throughout a project. Without proper planning, coordination, and resource allocation, projects can easily fall behind schedule. Delays can be caused by issues like

unclear project scopes, subcontractor issues, and material shortages. The standard deviation suggests a good level of agreement among the respondents on this aspect.

Lack of quality management policy and strategy with a mean score of 1.69 implies this factor affects quality at low extent since Lack of quality management policy can't be challenges and most of the policies are determine before the construction work begins. A standard deviation of 1.03 and with a 1.07 of variance implies the perception about Lack of quality management policy within the organization are same with each other

Lack of regular supervision with a mean score of 1.48 standard deviation of 1.0 and with a 1.08 of variance implies this factor affects quality at a very low extent assuming the supervision is done based on the work. And the result of standard deviation and variance the standard deviation suggests a good level of agreement among the respondents on this aspect.

Unwillingness of project staff to accept the quality management system with a mean score of 1.34 indicates this factor affects quality at a very low extent which refers to the fact that quality management system implemented at the beginning of project work and every employee should comply accordingly.

Problems with Contractors with a mean score of 4.48 implies at a great extent that relationship between the contractor and the consultant is a key factor for a good quality output. A standard deviation of 0.76 and with a 0.58 of variance implies the perception about Lack of quality management policy within the organization are same with each other

Unrealistic deadline with a mean score of 4.04 indicates at a great extent that unrealistic deadline has a big role on poor quality output according to the interview with senior officers and project managers one of the most significant consequences of unrealistic deadlines is compromised project quality. Rushed projects may lead to shortcuts in construction practices, resulting in subpar structures that could have long-term safety implications. A standard deviation of 1.2 and with a 1.5 of variance implies the expectation results are negative since a variance id higher than a standard deviation.

## 4.5 Discussion

This discussion was focused on triangulating the results that obtained through quantitative and qualitative data analysis method. The quantitative approach was used to collect data through questionnaire .Questionnaire was designed and data were collected quantitatively. The collected data were analysed and the findings of this study were identified.

As stated under the data analysis section in responding to the question concerning, A quality management system (QMS) in construction is essentially a set of tools and procedures that ensures a project meets specific standards and requirements throughout the entire process.

Quality management system in construction a book by Mohammed and Abdullah stated the gap with quality management system in project level and explain that it rather focused on only quality management system at the organization level According to (juran) quality does not happen by accident, it must be planned. The result also stated that there is separate quality policy at organizational level and the planning process is initially based on the Ethiopian Building standard specifications and quality requirements. This finding partially seems consistent with some of the literature and various among variables. In the literature some studies recommend that to have separate quality policy in the organization which help as guiding principle to undertake the whole process of quality management.

Construction quality assurance and control are crucial aspects of the construction industry, as they contribute to the overall success of projects. These practices involve the implementation of a quality management system, which includes the managing structure, responsibilities, methodology, processes, and management resources needed to achieve the organization's quality objectives (Othman et al(,2018). the company classifies the QA/QC process into two categories namely; off-site inspections and onsite inspections. The procedures that will be categorized as off-site compliance checks are Tender/Contract, Equivalence, Manufacturer/Supplier, and Sample/Mock-up; while the procedures that will be categorized as on-site compliance checks are Parts Compatibility Compliance, Delivery Compliance, Workmanship Compliance and Performance Compliance. This includes Inputs such as

Materials, Crews and Workmanships including Methods on the one hand, and components or trades of works and the final product on the other hand.

an article about Exploration of Engineering Supervision Quality Control Under Uncertain Model by ( Xu, (2020) express the construction quality control process as a systematic approach used to ensure that construction projects meet specified quality standards and requirements. With The quality of materials and equipment used in construction consultancy project a significant impact created on the entire project lifecycle. Durability and Longevity, Performance and Functionality and safety can be considered as factors for the effectiveness of the construction project. This includes implementing and monitoring quality control measures during the construction process, such as conducting inspections, tests, and audits. Projects within specified constraints to measure the quality of construction projects various methods can be applied

Regarding quality management factors Joy (2014) stated the major factors that affect quality; material, labour, financial issues, conformance to codes and standards, top management support, management factors, selection of contractor, selection of designer design, and co-operation of parties, contract documents and lack of communication. Likewise majority of the respondents identified qualified and experiences personnel with a mean of (4.5), quality of materials and equipment used in the project construction with a mean of (4.3) Similar to Everline (2014) identified four major factors that most important determinants in general construction projects; Experience and qualification of personnel, quality of materials and equipment, conformance to specification and quality assurance training and meetings.

Meanwhile, as shown on table above unrealistic deadline and inadequate technical skill have big impact on the quality of construction projects. And according to interview result showed that there are problems related with contractor's communication skill towards consultant is limited with respect to the working capital, machine and technical capacity.

# CHAPTER 5

## 5. Summery conclusion and recommendation

This chapter has three sections. The first section presents summary of major findings, the second section presents conclusion of the study derived from findings and the last section deals with recommendation that were made on basis of the findings.

### 5.1 Summary of the Finding

- This study was designed to Assessing the effectiveness of project quality management practice in construction project in the case of (wubishet) jekale cm consultancy. The study was organized in to five chapters. In the first part of the study the background of the study were designed focusing on the previous works of researchers and scholars through reviewing carefully based on the related points to the topic of this study and followed with the statement of the problem in which the gap of the study was identified and purpose of the study was determined
- In the second part of the study, the literature review from various sources to establish work done by other researchers, their findings, and identification of knowledge gaps which forms the basis of setting objectives and research questions of the study. The theoretical and conceptual frameworks were also explained.
- In the third part of the study points which were covered were the research design, target population of the study, sample size and sampling procedures. This was followed by data collection procedures, data collection instruments, validity of the instruments, reliability of instruments, data analysis techniques, ethical considerations and concludes with operational definition of variables.
- In the fourth part of the study the collected quantitative data, like demographic data, data collected through questionnaires and interviews were analysed and presented in tables and followed with text explanations. On the basis of the analysis made of this study the direction of getting the findings were identified.
- In the last part of the study the summary of the study, conclusions and recommendations were presented in this study.

## 5.2 Conclusion

The main objective of this study was Assessing the effectiveness of project quality management practice in construction project in the case of (wubishet) jekale cm consultancy To achieve the intended objective of this study descriptive survey method with qualitative and quantitative approach was the research design adopted. Quantitative approach was used in this study for collecting the quantitative data collected from 43 respondents from (wubishet) jekale cm Consultancy Company. Census was used to select the respondents since the total populations were selected as the respondents of this study. Data were collected from respondent's questionnaire and interviews. The collected quantitative data were analysed in frequency and percentage to give meaningful conclusion for the data that analysed in descriptive statistic. The qualitative data that were collected through document review were discussed in text explanations. On the basis of the analysis made of this study, the conclusions were made, and the findings of this study were identified and presented with the research questions side by side as follows.

The main research question was asked to Assessing the effectiveness of project quality management practice in construction project in the case of (wubishet) jekale cm consultancy.. The result of this study had indicated that effectiveness of project quality management in construction project at (wubishet) jekale cm consultancy is high. One of the major tasks of JCMC is Quality Assurance Services is to ensure contract compliance and customer satisfaction for the project under consideration and on the one hand to contribute advancement in the quality management practices. Throughout any project work the company always suggest a better opportunity and quality control method to the clients so us to satisfy their needs

To what extent dose the current QA/QC techniques is effective identifying and preventing defects at different stages of construction level in (wubishet) Jekale CM consultancy is the second research question and The result of this study had shown the level of project quality management success measured according to the company's quality assurance quality control guideline book according to the guideline It is a good practice to set up a well-established quality assurance guideline. in order to implement quality assurance and quality control (QA/QC) procedures, which can be considered as a system to be applicable for all construction projects. The QA/QC good practice guidance outlined reflects and measure practicality, acceptability, cost-effectiveness, existing experience and the potential for application on a national basis.

The last research question was asked to identify what are the main objectives of using quality assurance and quality control to ensure quality in construction project (wubishet) Jekale CM consultancy. The main objectives of using quality assurance and control is to make sure all the project works are as per the quality standards and setting up a well-established quality assurance guideline and applying it. The quality assurance/control procedures will be conducted for Inputs (materials and equipment), Productions (plants), Workmanships (crew, methods & processes) and Works. The quality assurance/control process as a whole can be classified into two categories namely; offsite inspections and on-site inspections. The procedures that will be categorized as off-site compliance checks are Tender/Contract, Equivalence, Manufacturer/Supplier, and Sample/Mock-up; while the procedures that will be categorized as on-site compliance checks are Parts Compatibility Compliance, Delivery Compliance, Workmanship Compliance and Performance Compliance. Therefore, to make sure all the project works are as per the quality standards, setting up a well-established quality assurance guideline and applying it is very helpful. The guideline will also help in preventing problems and risks that arise with poor quality of works that might come up with the material, equipment and/or workmanship

## 5.3 Recommendation

Based on the above findings the following recommendations are given:

- One essential aspect to look for in a construction consultancy firm is their breadth of services and multidisciplinary capabilities. A consultancy that can offer a wide range of services, such as architecture, civil and structural engineering, mechanical and electrical engineering, town planning, quantity surveying, land surveying, and landscape architecture is crucial for the success of a project. By saying this the top management of jcmc company should consider hiring more professionals to get a better result in finding new projects
- All managerial levels should be participated with sensitive and important decision-making. Continuous coordination and relationship between project participants are required through project life cycle in order to solve problems and develop project quality performance.
- Managing the contractor is very crucial to the project since the project budget, lifecycle and quality relays on managing the contractor properly. It would be better if jcmc changes the approach to managing a contractor since a lot of issues by a contractors difficulty to go with the compliances in the current project

These factors would suggest that successful project quality management requires a well written quality management careful appointment of a skilled project manager and other expertise spending time to define the project adequately; ensuring correct and adequate information flows; changing activities to accommodating employees' personal goals with performance and rewards; and making a fresh start when mistakes in implementation have been discovered.

Therefore, the company can make use of the results of this study to identify areas of improvements in order to manage its projects quality as per the standards which helps to manage the project in a more effective and efficient way.

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# St. Mary's University

## School of Graduate Studies

## Masters of Business Administration

### Project Management Department

Thesis on assessing the effectiveness of project quality management practice in construction project

The case of (wubishet)Jekale cm consultancy

Appendix A

Questionaries'

Dear respondent,

The purpose of this questionnaire is to collect data for the effectiveness of project quality management practice in construction project The case of (wubishet)Jekale cm consultancy For partial fulfilment of a degree in Masters of project management. Having confident in your frank and genuine responses will contribute immensely to the findings of this study, I would like to request you kindly to complete this questionnaire which will be kept

confidentially for the study purpose. I would like to express my heartfelt thanks in advance for taking part in this endeavor.

Name: eden balkew

Please put a"√" mark to all your responses in the box provided beside each statement.

1. Gender

Male ☐ female☐

2. Educational Background

Master's degree or above ☐ College Diploma☐

Bachelor's Degree ☐ High School Completed☐

3. Which of the following best describes your role in the building construction project?

Project manager ☐ resident engineer☐

Office engineer ☐ site engineer☐

Architecture ☐ others (please specify) ☐

4. Major Clients of the firms are?

Public ☐

Private☐

Cooperatives☐

others (please specify) ☐

**Part 2 Question regarding to quality and quality management system**

Please put a tick mark **"√"** the one that represents you most appropriately

5. From your point of view which of the following words define quality

- Compliance to requirement☐
- Accordance to specification☐
- Meeting specified requirement☐
- Customer satisfaction☐
- Others (please specify) ☐

6. What is your organization ‘s perception of quality?

- Focus on process☐
- A tool to increase profits☐
- A competitive advantage☐
- Others (please specify) ☐

7. Does your organization implement quality management system?

- No (Please go to next section of question) ☐
- Such a plan is under consideration☐
- A quality management system program has been implemented recently☐
- A quality management system has been a part of the organization policy for some time now☐

8. What type of quality management system do you have?

- Quality Control / Quality Assurance☐
- Total Quality Management☐
- ISO 9001☐
- Others (please specify) ☐

## Part 3 Main questions on the quality management system in the construction industry

1. Please express your opinion on the following quality management factors that affect performance of construction projects;

- The scale rating description: 5 = very strongly Agree, 4= strongly agree, 3= moderately agree, 2= slightly Disagree, 1= strongly Disagree

| S.no | Quality Factors | Rating | | | | |
|---|---|---|---|---|---|---|
| | | 5 | 4 | 3 | 2 | 1 |
| 1 | Qualified and experienced personnel | | | | | |
| 2 | Quality of materials and equipment used in the project construction | | | | | |
| 3 | Conformance to specifications | | | | | |
| 4 | Quality assurance training and follow up | | | | | |
| 5 | Top management support | | | | | |
| 6 | Contract documents | | | | | |
| 7 | Selection of contractor | | | | | |
| 8 | Co-operation of stakeholders | | | | | |
| 9 | Others please specify | | | | | |
| | | | | | | |

2. If your organization implements quality management system, does your quality plan contain the following?

| | yes | no |
|---|---|---|
| Responsibilities and authorities of project staff | | |
| list(s) of materials and schedule of accommodation used for the project, showing the verification requirement of each; | | |
| Inspection and test plans, or list thereof; | | |
| list of quality procedures and work instructions applicable to project—by making reference to the company's Quality Manual and Procedures; | | |
| list of project-specific procedures, work instructions and inspection | | |
| checklists, or target dates for their provision; | | |
| Frequency of updating the quality plan. | | |

3. How important do you think the quality management plan is to your constriction projects?

1. Very low ☐ 2. Low ☐ 3. Moderate ☐ 4. High ☐

5. Very high ☐

## Quality Management Challenges

4. What are the main challenges and obstacles of quality management in the construction projects in your opinion?

***Description: 5 = very strongly, 4= strongly, 3= Moderate, 2= Less, 1= very less***

| No. | **Quality management problem encountered?** | **Rating** | | | | |
|---|---|---|---|---|---|---|
| | | **5** | **4** | **3** | **2** | **1** |
| 1 | In adequate management support | | | | | |
| 2 | Lack of quality management policy and strategy | | | | | |
| 3 | Inefficient resources management | | | | | |
| 4 | Lack of regular supervision | | | | | |
| 5 | Unwillingness of project staff to accept the quality management system | | | | | |
| 6 | Lack of quality assurance team leading the process | | | | | |
| 7 | Problems with Contractors | | | | | |
| 8 | Lack of effective communication | | | | | |
| 9 | Increase of cost | | | | | |
| 10 | Unrealistic deadline | | | | | |
| 11 | Inadequate technical skill | | | | | |
| 12 | If any other please mention | | | | | |

5. Does the Bureau solve these challenges?

□ 1.Yes □ 2. No

6. If yes in what ways the organization solved these challenges? Please list mechanism

_____

_____

_____

_____

_____

9. How the organization's quality management practice look like?

1. It is improved ☐ 2. It is maintained ☐ 3.It is decreasing ☐

4. It is stopped ☐

2. Other, Please specify_____

**Additional Comments:**

1……

2……

3……

**Appendix B interview**

1. Would you tell me your current position in your organization, level and type of your education and experience on project management?

2. What is your general experience In your organization how is quality expressed in construction projects?

3. What do you think major objectives of quality management in the construction consultancy company?

4. Is there any quality management program your organization implements?

5. What are the problems that you think will affect the quality of construction projects during construction phase?
6. Do you have a quality assurance personnel separately? What are the major responsibilities? Or do other departments participate on the preparation of the quality plan?
7. How do you control the quality of material and work? Who is responsible?
8. Does quality assurance personnel's conduct regular supervision? How frequent?
9. How are projects quality maintained? What are the measures you take to control quality of projects?
10. How and in what ways are project quality related issues communicated?