



**ST. MARY'S UNIVERSITY**

**SCHOOL OF GRADUTE STUDIES**

**THE EFFECTIVENESS OF PROJECT QUALITY  
MANAGEMENT PRACTICES AND THEIR  
CHALLENGES IN BOLE AIRPORT EXPANSION  
PROJECT**

**BY**

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**July, 2023**

**ADDIS ABABA, ETHIOPIA**

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**BY  
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SCHOOL OF GRADUATE STUDIES FACULTY  
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PRACTICES AND THEIR CHALLENGES IN BOLE AIRPORT  
EXPANSION PROJECT**

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## DECLARATION

I, the undersigned, declare that this thesis is my original work; prepared under the guidance of Yilkal Wassie (Asst. Prof.). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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July, 2023

## ENDORSEMENT

This thesis papers are submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

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Advisor

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July, 2023

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## **List of Acronyms**

AABIA: Addis Ababa Bole International Airport

AI: Artificial Intelligence

Gantt: Graphical Representation of Activity Against Time

ICT: Information and Communication Technology

IOT: Internet of Technology

ISO: International Standard Requirement

IT: Information Technology

PERT: Program Evaluation and Review Technique

PMBOK: Project Management Book of Knowledge

PMI: Project Management Institute

PQM: Project Quality Management

QA: Quality Assurance

QC: Quality Control

QM: Quality Management

QMS: Quality Management System

TQM: Total quality management

VIF: Variance Inflation Factor

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## ABSTRACT

*This study aimed to assess the effectiveness of project quality management practices and their challenges in Bole Airport expansion project. to select participants for the study. The descriptive research design allowed the researchers to gather detailed information about the variables under investigation, while the quantitative data collection approach provided numerical data for statistical analysis. Additionally, the purposive sampling design helped ensure that participants with specific characteristics relevant to the research objectives were included in the study. The quantitative data were collected from 60 participants using a structured questionnaire The data were analyzed using descriptive statistics. Frequency and percentage were done to present the result. The result revealed that from the 7 variables, respondents agreed on their importance of the five variables, whilst the respondents neither agree nor disagree in their importance of the two variables. The two variables are involvement of top management and client's involvement. The findings revealed that the project quality management practices in Bole Airport expansion project were highly effective. The study also identified same challenges that affected the project quality management practices, such as lack of clear understanding of quality and low in implementation of quality assurance and control. In conclusion, the study revealed a high response rate and identified key variables of quality management, including the quality management processes. The project quality management practices in Bole Airport expansion project need to be improved by addressing the identified challenges. Based on these findings, it is recommended to ensure consistent implementation of quality management practice throughout the organization.*

**Key Words:** *Quality, quality management, quality planning, quality assurance, quality control*





# Chapter One

## Introduction

### 1.1 Background of the study

Maintaining satisfactory levels of quality in construction refers to maintaining long-term competitiveness and organizational survival for the business by satisfying client demands (Hailu, 2016). According to PMI (2014), the term "quality management" as applied to the construction industry encompasses concepts like quality control, quality confirmation, quality enhancement, quality measures, and so forth. Additionally, they discovered that the earliest type of formal quality management practice in construction dates back to ancient Greece and Rome.

A recent change in the business economy, driven by globalization, digitization, competition, customer customization, and networked labor, have been huge. The newest tech - the internet, Internet of Things (IoT), big data, artificial intelligence (AI), Web 3.0, 5G, Wi-Fi 6, and cloud computing have changed the way people work and do business. As a result, construction industries have moved from total quality management to Quality 4.0. Quality 4.0 looks at aligning quality management with Industry 4.0 tech like AI and digitalization to achieve efficiency and performance. With Quality 4.0, you can reduce costs and increase customer satisfaction through early defect detection and root cause elimination, and get products to market faster. Quality 4.0 also helps you get better info in real time, handle advanced tasks faster, and control quality with advanced systems for automatic quality monitoring and improvement. (Maganga and Taifa, 2023).

The ability to perform daily tasks in entirely new ways is provided by Quality 4.0. By increasing operational effectiveness and product design, lowering non-conformance and defect rates, and ensuring on-time deliveries. Quality 4.0 can significantly lower quality costs (Antony et al., 2023). Because early defect detection and root cause elimination speed up the time to market for products, it can also improve responsiveness and customer satisfaction. According to Antony et al., (2023) the main benefits of Quality 4.0 are related to the application of real-time and continuous monitoring systems, defect prediction systems, in-line intelligent quality control, and total inspection solutions (Antony et al., 2022, 2023). As a result, previously unavailable information is now accessible in real time, complex tasks can be handled more quickly, and control can be obtained through sophisticated systems for continuous quality monitoring and enhancement (Maganga and Taifa, 2023).

Harris and McCaffer (2001) assert that quality management practices include all actions taken by managers to ensure that their quality plans are carried out, including quality control, quality affirmation, and quality improvement (Werku & Jha, 2016). Additionally, PMI (2014) found that construction organizations have increasingly embraced quality management in their quest to address quality issues and satisfy client requirements. Quality has continued to stand out among the factors used to determine whether a project has succeeded or fail. All parties involved in construction projects now have a fundamental obligation to work consistently toward achieving an acceptable quality standard (Hailu, 2016).

According to Harris and McCaffer (2001), a project's quality execution is defined as the ability to deliver the building or structure within the specified timeframe, budget, and quality standards while also achieving a level of customer satisfaction that is deemed to be acceptable. Additionally, Hailu (2016) advises that quality execution upgrades are necessary to increase a contractor's effectiveness and profitability while also boosting customer satisfaction. Delivering high-quality tasks isn't an extravagance; rather, it's a crucial part of carrying out project designs with adequate supervision to ensure project success (Veitch, 2018). According to PMI, (2013), construction projects waste a respectable amount of time, money, and resources due to ineffective or nonexistent quality management methods. The construction industry has faced numerous detractors over the years for its subpar performance and lack of profitability in comparison to other industries (Ashokkumar, 2014).

Although project management practices are becoming more visible and significant to organizations, it is still a very challenging endeavor (Mir & Pinnington, 2014). According to The Chaos Manifesto (2015) by The Standish Group International, only 29% of all the projects surveyed in the information and technology (IT) sector of activity in 2015 were successful, 52 percent of projects were challenged (late, over budget, or with fewer features and functions than required), 19 percent failed (cancelled before completion, delivered but never used), and 89 percent were delivered on time, within budget, and with all necessary features and functions. Nevertheless, these findings demonstrate an improvement in project success rates since 2008, when the success rate was only 32% (The Standish Group, 2015).

Ethiopia has had issues with construction quality for a very long time. Infrastructure and other development projects receive a yearly budgetary allocation that is quite large. The quality outcomes of the projects' failure to fulfill the necessary standards lead to defective construction. Due to the requirement for maintenance and problem solving, additional investments are required (PMI, 2008).

## **1.2 Statement of the problem**

Practitioners refer to project management bodies of knowledge as "best practice" manuals for what the discipline entails. The collective knowledge in the field of project management is referred to as the project management body of knowledge (Peng, Junwen, & Huating, 2007). This knowledge includes both established conventional practices that are frequently used and innovative practices that are currently being adopted by the profession. The foundation of attempts to systematize project management knowledge through bodies of knowledge is the assumption that there are observable patterns and generalizations from which replicable rules, controls, and guidelines for "best practices" can be established, even if not in every situation. Due to its extensive usage in the context under study, the PMBOK Guide has been used as the study's primary source. The best project management techniques, according to Kerzner, (2015), result in increased business value, better benefit management activities, and greater benefit realization. The success of a project depends on effective project management techniques (Badewi, 2016).

Ethiopia's official construction industry is composed of a large number of native businesses as well as numerous significant foreign civil engineering and construction businesses. The majority of Ethiopia's micro entrepreneurs, who mostly work in the unofficial sector, are found in the country's construction industry, where they make up a sizable portion of the workforce. Significant public and private infrastructure expenditures have helped the sector and sped up Ethiopia's economic progress (Veitch, 2018).

It is crucial to recognize that one of the construction industry's main strengths is its ability to contribute to national output, which fosters the expansion of other sectors, while also keeping in mind that the industry plays a significant role in the socioeconomic development of the country and that this role has a significant impact on all economic activities both directly and indirectly. However, a number of problems and difficulties are limiting the performance of the construction

industry, including widespread corruption, significant cost and time overruns, a lack of consistently updated rules and regulations of the industry, the absence of a construction industry policy, and a lack of effective rules and regulatory mechanisms that help ensure compliance with various industry factors (EEA, 2008).

For a project to achieve its goals, there are precise steps that must be taken. Wideman (1999:2) defines a practice as "a strategy, approach, method, instrument, or technique that is particularly effective in enabling an organization to fulfill its objectives for managing a project." It is considered that there are a few widely accepted project management principles that make project management better and more distinctive, regardless of the type of business or project.

Construction projects usually encounter obstacles in developing nations generally, and Ethiopia in particular. In Ethiopia, 79.06 percent of projects had been unsuccessful in their endeavors. Implementation delays, inflated project returns, and poor workforce quality of projects were revealed to be statistically significantly responsible for projects failing to fulfill their targets (Lemma, 2014).

Project management performance is improved overall by the application of best practices for project quality management. It is essential for a project to follow project quality management best practices in order to meet the client's requirements and advance the industry.

The Federal Democratic Republic of Ethiopia has seen a tremendous development with the expansion of Addis Ababa Bole International Airport (AABIA Expansion Project). The nation's best interests as a landlocked country are served by this expansion project. The difficulties of this enormous project and other national megaprojects are vital for overseeing the nation's project management procedures, and they may also have a subdued effect on the advancement of the country. This research evaluates the effectiveness of project quality management practices and their challenges for the "Addis Ababa Bole International Airport Terminal Expansion Project," which was financed and constructed by Chinese government. The study also assesses the perceived project quality as well as the effectiveness of the integration of the independent variables into the quality management system.

Bole Airport expansion project is a strategic initiative to enhance the capacity and competitiveness of the airport as a regional hub for air transport. The project consists of building a new passenger terminal, expanding the existing runway, upgrading the air traffic control system, and improving the airport facilities and services. The project started in 2013 and is expected to be completed by 2022. The project is funded by the Ethiopian government and the Export-Import Bank of China, and is executed by China Communications Construction Company (CCCC).

The effectiveness of project quality management practices in Bole Airport expansion project can be evaluated based on the following criteria: customer satisfaction, stakeholder satisfaction, compliance with requirements and standards, prevention of defects and errors, continuous improvement, and cost-benefit analysis. Based on these criteria, we can identify some of the best practices that have been implemented in the project, such as:

- Establishing a clear and comprehensive quality management plan that defines the quality objectives, policies, procedures, roles and responsibilities, tools and techniques, and performance indicators for the project.
- Conducting regular quality audits and inspections to verify the conformity of the project deliverables and processes with the quality requirements and standards.
- Implementing quality assurance and quality control measures to ensure that the project deliverables meet the specifications and expectations of the customers and stakeholders.
- Applying quality improvement methods such as root cause analysis, corrective and preventive actions, lessons learned, and feedback mechanisms to identify and eliminate the causes of nonconformities and enhance the quality performance of the project.
- Integrating quality management with other project management processes such as scope management, time management, cost management, risk management, communication management, and procurement management to ensure alignment and coordination of the project activities.
- Engaging and involving the customers and stakeholders in the quality management process to ensure their participation, input, feedback, and satisfaction.

However, project quality management also faces some challenges that may hinder its effectiveness and efficiency in Bole Airport expansion project. Some of these challenges are

- Lack of adequate resources such as skilled personnel, equipment, materials, or funds to support the quality management activities.
- Complexity and uncertainty of the project environment, which may result in changes in scope, schedule, budget, or risks that may affect the quality performance of the project.
- Resistance or reluctance from some project team members or stakeholders to adopt or comply with the quality management practices or procedures.
- Lack of sufficient monitoring or evaluation of the quality performance or outcomes of the project.

These challenges require effective strategies to overcome them and ensure that project quality management is implemented successfully in Bole Airport expansion project. Some of these strategies are:

- Developing a common understanding and agreement on the quality expectations and standards among all parties involved in the project through clear communication, negotiation, documentation, and training.
- Allocating sufficient resources for quality management activities and ensuring their optimal utilization and allocation.
- Anticipating and managing changes in the project environment through proper change control procedures and contingency plans.
- Encouraging and motivating project team members and stakeholders to adopt or comply with the quality management practices or procedures through incentives, recognition, rewards, or sanctions.
- Establishing a regular feedback loop to monitor or evaluate the quality performance or outcomes of the project and take corrective or preventive actions as needed.

In conclusion, project quality management is an essential component of Bole Airport expansion project that ensures the project deliverables meet or exceed the expectations of the customers and stakeholders. However, it also faces some challenges that may affect its effectiveness and efficiency. Therefore, it is important to implement best practices for quality management as well as strategies to overcome these challenges in order to achieve a successful outcome for Bole Airport expansion project.

### **1.3 Research Questions**

Basic research questions that direct this investigation include the following:

- 1) What does currently existing project quality management practices apply in Bole International Airport Expansion Project?
- 2) To what extent does the project deliveries ensure the project quality management practices in Bole International Airport Expansion Project?
- 3) What are the challenges faced in implementing project quality management practices in Bole International Airport Expansion Project?

### **1.4 Objectives of the study**

#### **1.4.1 General objective**

The primary objective of the study is to analyse the practices for project quality management as well as the challenges faced throughout the terminal expansion project at Addis Ababa Bole International Airport.

#### **1.4.2 Specific objectives**

In the study, the following objectives were more specifically pursued:

- To identify the project quality management practices applied in Bole Airport Expansion Project.
- To evaluate the effectiveness of project quality management practices in ensuring the quality of the project deliverables.
- To identify the main challenges faced by the project team in implementing and preserving project quality management practices.

### **1.5 Significance of the study**

The study's goal is to identify best practices and obstacles in project quality management in order to help senior managers, technical managers, and project managers master it and manage the Addis Ababa Bole International Airport Expansion project and other projects like it more successfully. The study would encourage more research and potentially serve as a springboard for future studies that can utilize bigger data sets. Additionally, the recommendations and findings would be very helpful to lawmakers since they helped them focus on the areas that required improvement and corrective action on their end.

## **1.6 Scope of the study**

By utilizing quality processes, projects' overall performance can be improved. In reality, projects regularly fail to live up to client expectations while simultaneously going over price and time limits. This study aims to examine the effectiveness of project quality management practices and their challenges in Bole Airport Expansion Project. The scope of the study covers the following aspects:

- The project quality management processes and standards adopted by the project team and the stakeholders.
- The project quality management tools and techniques used for planning, executing, monitoring and controlling the project quality.
- The project quality management outcomes and benefits achieved by the project team and the stakeholders.
- The project quality management challenges and risks faced by the project team and the stakeholders. As a result, the study has solely assessed the quality management practices applied to the building of the Addis Ababa Bole International Airport.

## **1.7 Limitations of the Study**

In order to assess the degree to which independent variables were applied to dependent variables without changing the variables themselves, a convergent parallel mixed research design has been used in this study.

In addition, the study's sample frame was limited to active projects that were or would be under development at the time, which would have obscured data on earlier construction methods. The primary determinant of product or service quality is customer satisfaction; however, this study only assessed quality management practices from the implementer's perspective, which would obscure the quality component from the customer's perspective.



## **1.8 Organization of the study**

Five chapters make up the study, and they are organized as follows:

The introduction to the research, which is covered in Chapter 1, contains background information, a statement of the problem, research questions, objectives, significance, and limitations of the study, as well as information on ethics and how the study was organized.

Chapter 2 covers the literature review, which includes the study's theoretical foundation, empirical research, and conceptual framework. In addition, it discusses the fundamentals of quality management (QM), which are necessary for a fuller understanding of the concepts and a careful examination of the essential quality components of QM implementation.

The study's methodology, including its design, participants, method for collecting data, tools used for collecting data, study variables, and data analysis techniques, are covered in Chapter 3.

The findings of QM as it is now being applied are analyzed in Chapter 4, along with key components for QM's successful deployment.

The final chapter of the study contains the study's results, recommendations, and ideas for additional research.

# **Chapter Two**

## **Review of related Literature**

### **Introduction**

#### **2.1 Concepts and definition**

##### **2.1.1 Project and Project management overview**

Project management is a subfield of management and organization studies (Soöderlund, 2011). There are several definitions of project management, most of them come from project management professional organizations; however, they all specify the same concept. For example, the Association for Project Management (APM, 2012) defines project management as “the process by which projects are defined, planned, monitored, controlled and delivered such that the agreed benefits are realized”.

Project managers need to be knowledgeable in all the components that make up a project. A knowledge area refers to the entire range of ideas, expressions, and actions that make up the specialized profession of project management. For project types, project teams should use these knowledge areas and any extension knowledge areas as necessary. Project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management, project procurement management, and project stakeholder management are the ten general knowledge areas for project management. The study was restricted to quality management. (Loo, 2002)

##### **2.1.2 Project quality management**

Quality can be defined as creating a customer value, which stands to meet or exceed the customer expectations, in fact, quality can be achieved through integrating the organization unit working together (Knowles, 2011). ISO 9000 (2015) defines the quality of an organization’s products and services determined by the ability to satisfy customers and the intended and unintended on relevant interested parties. Project quality management possesses the processes and activities such as quality policies, objectives, and responsibilities of the implementer organization in a way to meet the needs and requirements of the customers and stakeholders (PMI, 2013).

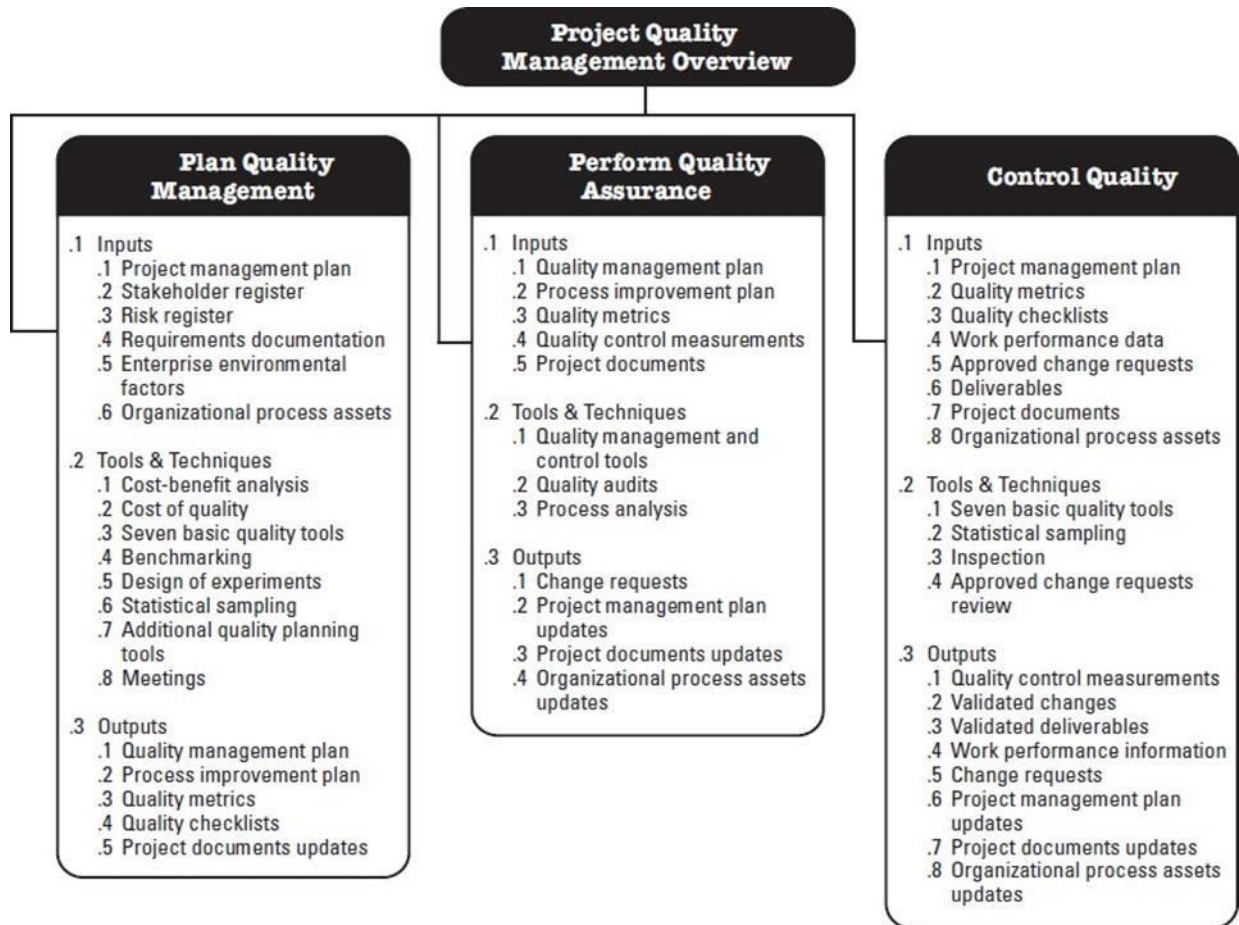
Project Quality Management is all about controlling the quality of services and goods, as the name suggests. The main accomplishment in project management is attaining the desired quality. Quality control should be ensured during project delivery. Yet, maintaining consistency in quality across projects, various products, and services is what is meant by quality rather than perfection and high quality goods and services.

Most often, corporate values and norms are used to set quality standards (Chandana, 2017). In fact, quality may be achieved by integrating the organization unit working together, with the goal of providing a customer value that meets or exceeds the customer expectations (Knowles, 2011). The ability of an organization to satisfy customers and the intended and unanticipated on relevant interested parties is how ISO 9000 (2015) defines the quality of an organization's products and services. The procedures and activities of project quality management include the implementer organization's quality policies, objectives, and responsibilities in a way that satisfies the needs and demands of the customers and stakeholders (PMI, 2013).

### **2.1.3 Project Quality management processes**

Three quality management processes, namely quality planning, quality control, and quality assurance, must be taken into account when structuring a project in order to ensure quality. These processes are focused on meeting the requirements and expectations of the stakeholders in order to deliver the defined outcomes. Project quality management processes apply different tools and techniques to enhance the output of the process using the specific inputs that are to be taken as a baseline to prepare and deliver the expected output, for example, planning quality can be implemented using the project scope baseline, stakeholder register, and other inputs to deliver the quality plan. Figure 2.1 shows the detail of the project management overview and the necessary inputs, tools and techniques and the final output of the processes (PMI, 2013).

**Figure 2.1: Project Quality Management Overview.**



**Source: Adopted from PMI (2013)**

### 2.1.3.1 Quality planning

The goal of quality planning, according to ISO 21500, is to "determine the quality requirements and standards applicable to the project and project deliverables and how the requirements and standards has been met, under the project objectives" (ISO 21500, 2021).

Establishing procedures, methods, techniques, tools, and resources to implement the planned quality actions to meet objectives and applicable standards should be part of quality planning. This includes deciding and agreeing on the goals to be attained and quality standards to be met, defining quality metrics and acceptance criteria for the project deliverables, assigning responsibilities, and creating monitoring plans (ISO 21502, 2020).

When planning for quality, the frequency, type, time, and location of monitoring and measurement activities are specified. The project organization also specify the applicable monitoring and measurement techniques, including statistical techniques, and the extent to which they have be used. Finally, evaluate the effectiveness of these techniques (Saraiva et al., 2009). To evaluate the effectiveness and success of a project, the data gathered is analyzed.

Project deliverables are anticipated to be better as a result of better planning, and the costs associated with poor quality are anticipated to decrease (Miguel, 2006). Harris and Macaffer (2001) defined quality planning as a set of activities whose purpose is to define quality system policies, objectives, and requirements, and to explain how to apply these policies, how to achieve these objectives, and how to meet these requirements. Quality plan should include quality policy statement (vision and mission), project quality structure and quality management system, quality objective and rectification of defects and prevention of future problems.

### **2.1.3.2 Quality Assurance**

According to Greene and Stellman (2013), the goal of quality assurance is to enhance procedures to ensure that the work is carried out effectively and efficiently, reducing waste and eliminating activities that do not add value, and is completed with the fewest number of flaws and in accordance with the required standards.

In order to ensure that the project's objectives and applicable standards have been followed, quality assurance check that the quality procedures, plans, methods, techniques, tools, and resources have been followed, and compare the results to the project's requirements and specifications (ISO 21502, 2020).

Activities for enhancing methods and processes that have an impact on the execution of project deliverables take information from quality planning and quality control into consideration. According to Miguel et al. (2012), quality audits are used to check compliance with applicable requirements, quality processes, and standards. Quality audits and are a tool to support and enhance the effectiveness and efficiency of project tasks. They are intended to determine whether the project complies with the processes, requirements, and quality policy of the company or client. Analysis and comprehension of the organization's processes favor information flows and work

efficiency, avoiding redundant planning, and adhering to the company's or client's quality standards.

According to PMBOK (2012), the "quality assurance process favors continuous improvement," project-level quality audits also aim to evaluate the relationship between what was planned and what is being carried out to ensure the quality of project deliverables. The quality of all processes can be raised through interactive continuous improvement. By eliminating activities that don't add value, waste is reduced through continuous process improvement. As a result, processes can operate more effectively and efficiently.

Tekelebrhan (2014) implies quality assurance is oriented towards prevention of quality deficiencies. Its goal is to minimize the risk of making mistakes in the first place, thus avoiding the necessity for rework, repair or reject. Evaluating overall project performance on a regular basis to provide confidence that the project satisfies the relevant quality standards (Lakshmi, 2015).

### **2.1.3.3 Quality Control**

Implementing procedures to monitor and evaluate the quality requirements and assumptions established for the project is one example of a quality control action (ISO 21502, 2020). To make sure it satisfies quality standards, every project deliverable must be inspected. Creating adjustment and project recovery plans to handle deviations, issues, and/or quality opportunities is covered in the PMBOK (2012). Updates and change requests are taken into account when creating documents and project management plans. (ISO 9000, 2015).

Project deliverable inspection and testing are included in the quality control activities. According to Greene and Stellman (2013), "Testing involves checking to ensure that the product does what it is supposed to do, which means we must have a very clear idea of what it is that is expected of the product so that we can assess its quality. This means that when we run a test, we must know exactly what is expected from the product. Because of this, compliance with requirements is one of the most crucial concepts in quality.

According to ISO 21500 (2020), quality control must be used throughout the course of the project. It entails monitoring whether the standards for deliverables and processes are being met and finding errors using recognized tools, procedures, and techniques.

Numerous quality tools are used in quality control, including statistical process control tools like control charts, capability analysis, parametric and non-parametric statistical tests, regressions, time series analysis, etc. Project monitoring and performance evaluation are both indispensable components of quality control.

To decide if the project performance is acceptable and to define actions and recovery plans, the outputs of the progress assessment must be compared with the planned actions and objectives. According to ISO 21500, changes must be recorded and managed throughout the project. Project managers are required to track change requests, evaluate them for benefit, scope, resources, time, cost, quality, and risk, and determine their impact before implementing them (ISO 21500, 2021). Depending on how its impact is judged, a change request may be modified or even rejected. Once the change has been approved, it is announced to all pertinent parties for implementation, which may include updating the project documentation as necessary.

Quality control is the method of monitoring specific project results to determine if they convey with relevant standards and identifies different methods to eliminate the causes for the unsatisfactory performance. It is the procedure of techniques and activities that compare actual quality performance with goals and define appropriate action in response to a shortfall.

Project team members set up the technical processes and procedures that ensure each step of the project provides a quality output from design to development through implementation and maintenance. In each step 's output must conform to the overall quality standards and quality plans, thus ensuring that quality is achieved (PMI, 2008). In the construction industry quality control has played an incomparable role. The importance of monitoring specific project results are to determine if they comply with relevant quality standards and identifying ways to eliminate cause of unsatisfied performance contract documents comprise a clear, complete, and accurate description of the facility to be constructed, correctly conveying the intent of the owner regarding the characteristics of the facility needed to serve his or her purposes (Miguel, 2006).

There are many factors affecting the quality in the construction projects, such as design, materials, machinery, topography, geology, hydrology and meteorology, construction technology, methods of operation, technical measures, and management systems and so on Construction companies must follow to the principle of quality first, and sustain on quality standards, to provide more high quality, safe, suitable, and economic composite products (Lakshmi, 2015).

Additionally, Juran and Godfrey, (1999) implied quality control relies on five basics: a clear definition of quality; a target, a clear goal; a sensor, a way to measure actual performance; a way to interpret the measurement and compare with the target; and a way to take action, to adjust the process if necessary.

#### **2.1.4 Effective project quality management practices**

Project quality management practices is a management approach that emphasizes customer satisfaction and continuous improvement in the organization (Sila, 2003). This is enabled by each employee within the firm who must consider the requirements of the person who uses their output. The synthesis of principles and philosophies of QM researchers in construction-related studies has yielded seven elements of QM practices. These elements are continuous improvement, commitment, customer focus, strategic planning, operation focus, employee involvement, measurement, and analysis and knowledge management (Jong et al. 2019).

##### **2.1.4.1 Top Management commitment**

The effectiveness of QM system mostly relies on top management commitment and their dedication to organization's goals and objectives (Hing and Antony, 2001; Rehmani and Naseem, 2020). Top management or executives act as key drivers of the quality management (QM) program because they establish goals, systems and values to achieve customer satisfaction (Ahire et al. 1996). Commitment is essential not only for discussing or achieving business goals, strategies and objectives but also for providing motivation and direction to the workforce of an organization (Gupta, 2020). The successful completion of any work targeted at changing the organizational operations philosophy is robustly connected with upper-level management commitment. Othman et al. (2019) argued that the consistent involvement of top management in quality-related activities would facilitate the changing attitudes of employees toward quality in an organization.

Press (2019), defines commitment as a willingness to give your time and energy to something that you believe in, or a promise or firm decision to do something: which means project implements must make a commitment to implement the project for the full project lifecycle in order to meet the project requirements. In order to win project participants commitment, it is vital to properly



plan the project goals, tasks, timelines, and target dates; using tools such as PERT or Gantt chart, by allowing participants to give their input and to make them understand what they are agreeing on the drawn goals and objectives and what is expected from them so that they would contribute in a committed manner (Salle, 2013). According to Wysock (2014), it is essential to have a motivated team members for the project success and by aligning individual's interest and meeting their professional improvement needs it is possible to gain commitment from the team members.

Taylor et al (2003) implies the involvement, comprehension, and customer-focus of senior managers are crucial preconditions for QM success. According to Samson and associates (1999), among the key predictors of performance QM practices are leadership and human resource management. In their research on the subject of construction, Low et al. (2004) stated top management commitment as one of the factors that would reflect QM performance measures in construction firms. Correspondingly Chin et al. (2003) study, top management commitment is the key to a successful ISO 9000 implementation. Haupt et al. (2004) argued that as QM is implemented on construction sites, high levels of management actions result in a decreased prevalence of the issues. According to Arditi et al (1997) emphasized that each stage of the building process needs strong management commitment to quality and continuous quality improvement. Management should actively participate in the QM process' implementation rather than delegating it, according to Biggar's (1990) advice. When talking about management commitment, one of the issues that comes up is how the term is conceptualized.

Goal setting, feedback, and participation are some of the common characteristics that different authors have used to define it. Leadership is the top priority. Common goal-setting, management review and continuous improvement, management involvement and leadership, management attitude toward change, budget allocation, change planning, provision of methods for tracking the progress of construction works, initiative for successful implementation, support, In addition to the aforementioned, ISO 9001:2000 mandates the following in relation to management commitment.

Communicating about the importance of meeting customer as well as statutory and regulatory requirements;

- a. Establishing the quality policy;
- b. Ensuring that quality objectives are established;
- c. Conducting management reviews;
- d. Ensuring the availability of resources.

According to WebFinance Inc (2019), top management is the highest-ranking executives such as chairman/chairwoman, chief executive officer, managing director, president, executive directors, executive vice-presidents, branch managers, managing directors are responsible for the entire project. In addition, top management interprets the policy formulated by the board-of-directors into goals, objectives, and strategies, and projects into a shared vision of the future works, they make decisions that affect everyone in the organization and are held entirely responsible for the success or failure of the project in general. Al-Mamary, Shamsuddin, and Aziati (2014) further elaborated that organizations have two dimensions which are end-user training and top management support whereas the top management support includes the level of support provided by managers for the organization.

#### **2.1.4.2 Employee Involvement**

Involvement of employees is about active participation of organizational members in various levels of the decision-making process. Employees at all levels are a vital asset in an organization without which it would not achieve its goals and objectives (Psomas et al, 2014). Amah and Ahiauzu (2013), studied employee involvement and organization's effectiveness. They found that employee involvement positively influenced the effectiveness of an organization. Bakotić and Rogosćić (2017) researched employee involvement as the key element of quality practices. Results showed that employee involvement positively affected the implementation of the system management method, process method, continual improvement, and decision-making method.

#### **2.1.4.3 Client or Customer Focus**

Quality management is targeted towards a customer-oriented approach. Knowing and understanding the customers and client's necessities, being responsive to the demands of the client, and additionally, ensuring satisfaction of the customer have led to growth in revenue, profitability, cash flow and market share (Williams & Naumann, 2011). Pambreni et al. (2019) argued that focus on customers was an essential principle for the success of an organization because it was a starting point in any quality initiative. They studied TQM implementation in food companies and found that customer focus had a significant positive effect on organizational performance in the service sector of Spain. This study also suggests that focusing on clients/customers leads to a better understanding of clients'/customers' requirements, client/customer satisfaction and improved organizational performance. Zou et al. (2014) found that management strategy for customer relationships led to better project performance.

#### **2.1.4.4 Continuous Improvement**

Burati and Oswald, (1994) said quality management is being termed "a journey, not a destination". It is about adopting an improvement-centered culture, understanding the customer requirements, and improving the processes to satisfy customers (Burati & Oswald, 1994). Continuous improvement's fundamental idea is to prevent mistakes and defects from recurring (Hing & Antony, 2001). Lizarelli et al. (2019) analyzed the association between innovation performance and continuous improvement in the manufacturing industry of Brazil. They found that continuous improvement (CI) had a positive connection with innovation performance. Since CI aims to prevent defects, reduce waste and enhance performance.

#### **2.1.4.5 Communication and Interaction**

Communication is defined as a process by which information is exchanged between individuals through a common system of symbols, signs, or, therefore, interaction is a mutual or reciprocal action or influence between the parties that the information will be exchanged (Webster, 2019) According to PMI (2013), communication should be planned properly otherwise insufficient communication plan may cause problems such as late message delivery, delivery of a message to

the wrong audience, and unsatisfactory communication to the stakeholders and misunderstanding or misinterpretation of the message communicated through the participants.

Since interaction is defined as a mutual or reciprocal action or influence between the people that the information will be transmitted between, communication is the process by which information is exchanged between individuals using a common system of symbols and signals (Merriam Webster, 2019). Insufficient communication plans can result in issues such message delivery delays, message delivery to the incorrect audience, inadequate communication to stakeholders, and miscommunication or misinterpretation of the message delivered through participants, according to PMI (2013).

#### **2.1.4.6 Employee Training**

Employees need to consistently increase their knowledge and pick up new abilities to perform their jobs more effectively in today's competitive economy. By making their work more convenient, this help both them and the company they work for. Training can be characterized as an educational process that includes the development of concepts, skills, a change in attitude, and increased knowledge to improve an individual's performance. According to MbaSkool. (2019), employee training is a programmed created to improve the technical skills, knowledge, efficiency, and value creation needed to perform any given work much more effectively.

#### **2.1.5 Challenges in Effective Quality Management Practices**

Regarding the application of quality management, some issues have been noticed. Haupt et al. (2004) noted a number of challenges to implementing quality management on construction sites, i.e. A lack of interest in quality management among suppliers and subcontractors, excessive paperwork, a transient workforce, field workers who view quality management as irrelevant, difficulty measuring results, low bid subcontracting, and too much paperwork. The most challenging task in implementing ISO 9001 in engineering consultancies in Hong Kong, according to Tang and Kam (1999), is getting engineers to understand and accept the system. This is followed by a lack of strong management support and poor communication. According to an interview conducted in Sweden, Landin (2000) asserted that many of the concepts in ISO 9001 are perceived as being too abstract and challenging to understand in the construction process. Considering the numerous stages of the construction process covered and the conflicting interests represented, he

also asserted that it would appear difficult for a company to increase its efficiency and competitiveness by using ISO 9001 alone. Moatazed-Keivani and associates (1999) observed issues with bureaucracy, expense, time consumption, and interpretation in relation to the application of ISO 9000 standards in the United Kingdom (UK) construction industry.

According to Kumaraswamy and Dissanayaka (2000), the three most significant drawbacks of ISO 9000 certification for Hong Kong contractors are an increase in bureaucracy, more paperwork, and management time commitments. Abdul-Rahman (1996) observed several shortcomings related to the quality management implementation in UK, i.e. The level of commitment between top management and workers on the job site varies, QA and QM are not fully implemented, and quality management was only used during the construction phase. According to Low (1994), the majority of Singaporean contractors think that the most important factors in implementing quality assurance (QA) are those that relate to people. Cultural and administrative barriers to the implementation of quality systems have been noted by Serpell (1999). Au and Yu (1999) identified issues with documentation, quality inspection control, and process procedures in their study of the quality management of a significant infrastructure construction project in Hong Kong. Lai, Weerakoon, and Cheng (2002) observed flaws in the implementation of quality management for the construction industry in Hong Kong with regard to the dissemination of improvement information and teamwork structures for quality improvement. In order to significantly improve quality, Kubal (1996) contended that the construction industry lacked open communications and reciprocal support derived from relationships of trust among project participants.

### **2.1.6 Best practices, guidelines, or international standards in project quality management**

Quality standards are defined as a document that provides guidelines, specifications requirements and characteristics that can be used regularly to guarantee that products, services, materials, and processes are fit for purpose. Quality Standards are incorporated in quality planning and it is used to identify which quality standards are required to meet the project or product objectives and which standards are relevant to meet the expectation of the product (Rose, 2005). Standards provide organizations with a shared goal so that the procedures and requirements to meet the expectations of their stakeholders can be common throughout the organization. Standards present specific

descriptions, terminology and they offer an objective to the convincing basis for organizations and consumers to communicate and perform business (ASQ, 2015).

A technique, method, or process is a best practice when it is applied to a specific condition or setting because it is thought to be more efficient and effective in reaching a goal than any other. Best practice is a term used to describe the process of creating and adhering to a standard way of doing things. It is based on experience. Best practices in project management are a broad concept that encompasses guidelines and international standards.

The goal of standards and guidelines is to enhance project management. Most project managers do not distinguish between the two notions in practice, which is why we chose to write this article about both international standards and guidelines in project management as well as techniques that can help project managers achieve their objectives. Standards are anticipated to be solid, unbiased, and objective, whereas professional bodies' recommendations are flexible (Ahlemann, Teuteberg & Vogelsang, 2009). Nonetheless, the best practices and guidelines provided by professional groups are frequently the foundation for the standards set by specialized organizations. Nonetheless, there are instances where recommendations become standards, such as when the PMI project management body of knowledge became an ANSI standard in 2004. (Ahlemann, Teuteberg & Vogelsang, 2009).

### **2.1.7 Advantages of using best practices in project management**

Project management was first acknowledged historically in the 1950s as a distinct management approach, distinct from other management approaches used in government or corporate enterprise (Nielsen, 2006). Today, project management is a global phenomenon, with approved and used project management techniques maturing into international standards and guidelines. According to the Global Working Group, the qualities of global standards are applicable, acceptable, meaningful, used, and cherished (Nielsen, 2006).

Transfer of knowledge: Project management is the most widely found cause for failure to meet project objectives and goals (Nielsen, 2006, pp. 61). A standardized approach of project management comes to support the project manager when dealing with multiple projects with different competency needs, reducing the management risk and maximizing the achievement of goals.

**Better communication:** Communication is a key element in project management, being a major factor that influences the success or the failure of a project. Standards are also expected to help harmonize divergent terminology and different understandings of processes and methods (Ahlemann, Teuteberg & Vogelsang, 2009, pp. 292);

**Time and cost savings:** Projects are time dependent, so time management is part of project management. It's only when you measure time when you see how precious resource is spent reinventing the wheel (Ford, 2008, pp. 31). Best practices in project management bring the benefit of saving time and money in dealing with projects, goals that all project-based organizations must strive toward, particularly in time of economic recession.

**Better process quality:** Standards and guidelines improve quality by reducing failure and maximizing the achievement of goals.

**Better teamwork:** Better organized team; the tasks has been clearly defined, and the teamwork be more efficient.

**Better position on the market:** Applying international standards and best practices in project management contributes to a better position of the business on the market, as it prove high project management competence to all stakeholders.

**An international approach of labor:** A standard approach of knowledge, competence and processes facilitates working in an international environment.

**Better monitoring and controlling of projects:** In a global economy, standards are needed to improve the efficiency of monitoring and controlling international projects.

**A more efficient and objective audit:** Standards are essential in auditing projects. Following international standards increases the efficiency of the auditing process.

## **2.2 Theories Related to the Study**

The theoretical framework of the study is based on the following theories related to project quality management:

- The Project Management Body of Knowledge (PMBOK) Guide, which defines project quality management as "the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken" (Project Management Institute, 2017, p. 285). The PMBOK Guide identifies three

main processes of project quality management: quality planning, quality assurance, and quality control.

- The Total Quality Management (TQM) approach, which emphasizes customer satisfaction, continuous improvement, employee involvement, and process management as the key principles of quality management (Deming, 1986; Juran, 1988; Crosby, 1979). TQM advocates for a holistic and strategic view of quality that encompasses all aspects of an organization's operations and culture.

- The ISO 9000 family of standards, which provides guidelines and requirements for establishing and maintaining a quality management system (QMS) that can enhance an organization's ability to meet customer and regulatory expectations (International Organization for Standardization, 2015). ISO 9000 defines quality as "the degree to which a set of inherent characteristics of an object fulfills requirements" (p. 3).

- The Lean Six Sigma methodology, which combines the concepts of lean production and six sigma to eliminate waste and reduce variation in processes and products (George et al., 2005). Lean six sigma aims to achieve operational excellence by applying a systematic and data-driven approach to problem solving and improvement.

- The Deming cycle, which is a continuous improvement model that consists of four steps: plan, do, check, and act (Deming, 1986).

- The quality function deployment (QFD), which is a customer-oriented approach that translates customer requirements into technical specifications and prioritizes them based on importance (Akao, 1990).

- The total quality management (TQM), which is a holistic philosophy that emphasizes customer satisfaction, employee involvement, continuous improvement, and process optimization (Oakland, 2003).

- The Quality Function Deployment (QFD) method, which is a tool for translating customer requirements into design specifications and quality characteristics, using a matrix called the House of Quality (HOQ) (Akao, 1990).



## 2.3 Empirical Study

The study by Solomon, Obodoh, and Onoh (2016) identified the variables that favorably affect the quality of building construction work as well as the negative effects of not adhering to the quality standard and good effects of doing so. The primary aspect that positively affects quality in building construction work, according to the research, is effective communication with the project team and client. It promotes a climate of openness and trust that is necessary for productive, efficient, and high-quality building work. Other factors include a dedication to quality, a positive attitude towards quality, effective/efficient quality planning, adequate/complete design and documentation, effective/efficient construction methods, hiring qualified individuals for construction work, effective/efficient teamwork, use of quality construction materials, supervision of construction workers, motivation, training and seminars on quality management, use of appropriate equipment for construction work, and adhere to.

Inadequate workmanship and structural failure are the main consequences of not adhering to the quality standard for building construction works, while litigation was ranked last. Improving the quality of the finished product or result of construction was ranked as the top benefit of adhering to quality, while an improvement in workers' morale (artists/laborers') was ranked last. Furthermore, the study went into detail about how to develop a construction quality management plan that is fully defined during the pre-construction phase of any project and that is understood by all parties.

Insufficient planning, poor scheduling, rising material costs, poor site management and supervision, excess quantity during construction, and additional work were just a few of the factors that Melaku (2017) found to be limiting construction cost management. The projects were also implicated as being constrained from a quality management practice perspective. Furthermore, Melaku (2017) found that low-quality handover to beneficiaries was one of the effects of the housing program's cost overrun.

Hassina (2016) found that the following planning issues existed: associated parties were not involved in the project planning stages; the overall project scope was not adequately defined;

resources were not scheduled clearly; the client did not provide a stock of materials; the planning did not differentiate based on the site conditions; and the cost of the project was prioritized over its completion, which had an impact on the project.

According to an empirical study by Jha and Iyer (2006), top management support and their competence, the interaction between project participants, the competence of the owners, as well as monitoring and feedback from project participants, are the factors positively affecting a construction project's ability to reach the desired quality level. Along with the previously mentioned influencing factors, quality can be improved over time by continuously reducing defects. Training staff members who engage in quality activities can also enhance quality if it is accompanied by clear communication of the plan and activities to be carried out during the expansion project. In their study, Jha and Iyer (2006) found that increasing top management support would increase the likelihood of improving performance by 15% from its current level and that increasing participant interaction would increase the likelihood of producing very good quality by 12% from its current level. These findings are in line with the philosophies of quality experts who believe that top management support and communication are crucial in producing high-quality products. Study top management participation, according to Tzempelikos (2015), facilitates the relationship between top management commitment and quality output, which lead to a favorable association with performance.

Additionally, Jha and Iyer (2006) found in their research that the management function in the construction business is more crucial to obtaining quality than the labor itself. Employee training is carried out with the intention of disseminating knowledge and guidelines to staff members so that they can enhance their performance via learning and be profitable, effective, and productive in the execution of their duties as a whole (Heathfield, 2018). As a result, the performance of the project quality would benefit from the presence of skilled resources. Figure 2.2 independent variables are taken into consideration to illustrate the level of implementation of each independent variable on the intermediate variable and dependent variable, which is project quality management, for the purposes of this study. The goal of the research is to learn more about the practises and challenges of project quality management in the chosen project.

Jha and Iyer (2006) tested and discovered that top management support and participant interaction or communication have a positive relationship with project quality performances; the other independent variables were not statistically significant in their study; however, in this study, the level of implementation of commitment of all participants; the level of regular budget updates; and the availability of trained resources was assessed with the dependent variable. Therefore, the implementation of the key project quality management processes quality planning, quality assurance, and quality control and improvement was taken into consideration in the research. In addition to the aforementioned components, the variables listed below were considered independent variables and were believed to be factors influencing the project quality management. The independent variables were top management support, the dedication of all project participants, communication, regular budget updates, and the availability of trained human resources.

The purpose of this study is to examine the effectiveness of project quality management practices and their challenges in Bole Airport expansion project. The study aims to identify the factors that affect the quality of the project, the methods and tools used to ensure quality, and the barriers and opportunities for improvement. The study also seeks to compare and contrast the findings with previous studies on similar projects, and to highlight what makes this study different from others.

One of the main differences of this study from previous studies is that it focuses on a specific project in a developing country context, where the quality standards and expectations may differ from those in developed countries. Furthermore, the study involves multiple stakeholders, such as project managers, engineers, contractors, consultants, and clients, to capture their perspectives and experiences on the project quality issues. The study also considers the environmental, social, and economic impacts of the project quality on the airport operations and the surrounding community.

## **2.4 Research Gap**

Project quality management (PQM) is a critical aspect of any construction project, especially in large-scale and complex ones such as airport expansion projects. PQM practices aim to ensure that the project meets the requirements and expectations of the stakeholders, as well as the standards and regulations of the industry. However, PQM practices also face various challenges in the

implementation and execution phases, such as lack of resources, communication gaps, cultural differences, and environmental factors.

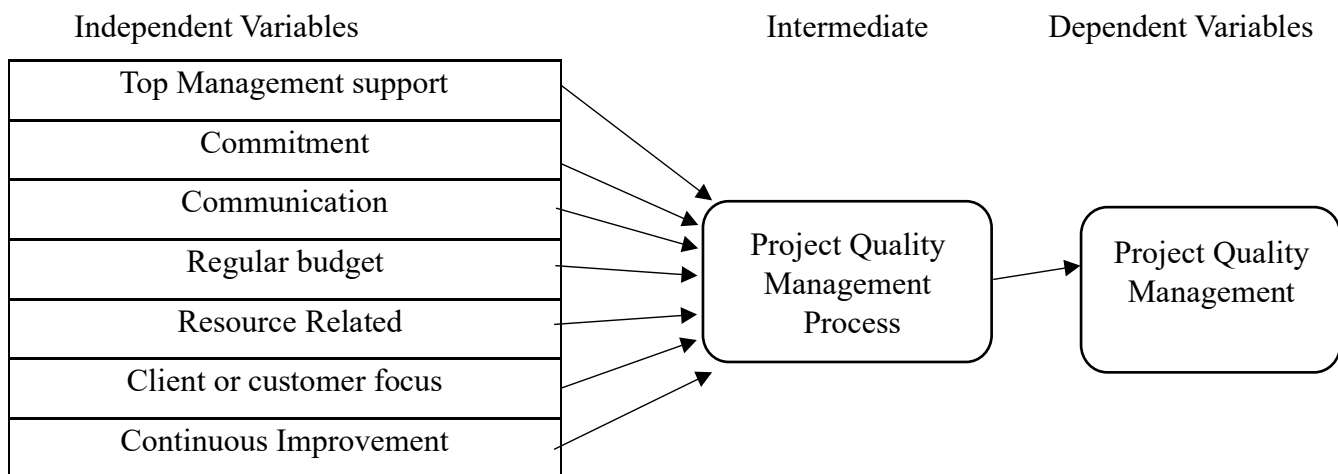
This study focuses on the effectiveness of PQM practices and their challenges in the Bole Airport Expansion Project (BAEP), which is a major infrastructure development project in Ethiopia. The BAEP aims to increase the capacity and efficiency of the Bole International Airport, which is the main gateway to the country and the region.

The main contribution of this study is that it provides a comprehensive and contextualized assessment of PQM practices and their challenges in the BAEP, which is one of the largest and most significant airport expansion projects in Africa. The study also fills a gap in the literature on PQM practices in developing countries, especially in Ethiopia, where there is a scarcity of empirical research on this topic. Furthermore, the study offers practical implications and recommendations for improving PQM practices and overcoming their challenges in the BAEP and similar projects.

## 2.5 Conceptual framework of the study

The conceptual framework demonstrates the basic methodology used to direct this investigation. As a result, the conceptual framework used in this study was adjusted to fit the needs of this study. The degree to which those independent variables are implemented on the project quality management is shown in Figure 2.2.

**Figure 2.2: Conceptual framework**



## **Chapter Three**

### **Research Design and Methods**

#### **3.1 Study Context**

Ethiopian Aviation Group, formerly known as Ethiopian airlines, is the national Airline of Ethiopia with its main hub at Bole International Airport. It was founded in 1945 and commenced operations on 8th April 1946. Ethiopian Airlines is the fastest growing Airline in Africa. In its seventy plus years of operation, Ethiopian has become the continent's leading carrier, unrivalled in efficiency and operational success commanding the lion's share of the Pan- African passenger and cargo network operating the youngest and most modern fleet to more than 125 international passenger and cargo destinations across five continents.

In order to provide passengers seamless end to end services, the former Ethiopian airports enterprise is restructured and merged with Ethiopian group starting from July 1, 2017. In order to increase the passenger capacity of the Addis Ababa bole international airport (AABIA) to 22 million per year, the Ethiopian aviation group is undergoing an expansion project on its terminal 2 with an estimated cost of 225 million USD.

As in any projects, the expansion project has the five basic functions which include project initiation, planning, execution, monitoring and evaluation and closure. This study is focused on identifying the factors affecting the successful implementation of quality.

#### **3.2 Research Design**

A research design is used as a master plan that outlines the methods and procedures for gathering and analyzing the necessary information, according to Zikmund, Babin, Carr, and Gryphon (2009). A research design is also used as a framework or plan of action for the research that has been conducted.

The research design is a template highlighting the research methods to guide data collection (Babin & Zikmund, 2016). There are three categories of research design; exploratory research, descriptive research, and causal research (Babin & Zikmund, 2016). Descriptive research design was used in this research.

Descriptive research is a type of research that involves gathering data to describe the characteristics of a population, situation, or phenomenon being studied. It is often used to answer questions related

to what, when, and how. Descriptive research does not manipulate variables or test hypotheses, but instead, it describes the data collection, organizes, tabulates, depicts, and describes the data collection. Descriptive research can be reported using surveys, observational studies, and case studies, and it can use both quantitative and qualitative methods to compile the data. Descriptive research is often used as a preliminary research method to explore the background, details, and existing patterns in a problem to fully understand it. Descriptive research aims to accurately and systematically describe a population, situation, or phenomenon and can answer what, where, when, and how questions, but not why questions.

### **3.3 Research approach**

Creswell (2013) divides the research methods into two categories: qualitative research methods and quantitative research methods. The author defines quantitative research as a technique that uses numerical data and is expressed in ways like statistics, percentages, etc. A quantitative research approach was applied in this study. The purpose of this research is to examine the effectiveness of project quality management practices and their challenges in Bole Airport Expansion Project. The quantitative data was collected through a survey questionnaire administered to the project stakeholders, such as the project manager, the project team members, the contractors, the consultants, and the clients. The qualitative data has been collected through semi-structured interviews with selected key informants from the same stakeholder groups.

### **3.4 Target Population and Sample design**

#### **3.4.1 Population of the study**

The study was used a census method to collect data from all the relevant stakeholders involved in the project, such as the project manager, the project team, the contractors, the consultants, and the clients. The census method has allowed the study to obtain a comprehensive and accurate picture of the current situation of project quality management in the project, as well as the factors that affect its performance and outcomes.

The study used only quantitative data analysis techniques to address the research questions and objectives. The expected contribution of this study is to provide useful insights and

recommendations for improving project quality management practices and overcoming their challenges in Bole Airport Expansion Project, as well as other similar projects in the future.

### **3.5 Data gathering tools**

This study used structured questionnaire as method of data collection to collect data from the key workers of the project. The questionnaire addresses the demographic characteristics of respondents and questions on assessing the project quality management practices and their challenges. The target groups were selected as respondents because they were deemed to be knowledgeable about the project implementation practices of the project. The research evidence was gathered by using both close-ended and open-ended questionnaires. Mixed questionnaires have many merits; the most important of this advantage is its considerable flexibility (McNabb, 2005).

### **3.6 Data gathering procedure**

Data is the information gathered from the respondents or through any other source that is useful and relevant to the research topic that has conducted by the researcher. The main sources of the data used are from both primary and secondary to determine the efficiency of project quality management systems and its difficulties are also examined in the Bole Airport expansion project.

### **3.7 Method of data analysis**

By creating summaries and using data analysis tools, data analysis entails condensing the gathered data to a manageable amount (Cooper & Schindler, 2008). The Statistical Package for Social Sciences (SPSS Version 23), which provides extensive data handling capabilities and numerous statistical analysis routines that can analyze small and large data, is used to clean, code, and organize the quantitative data collected in a way that facilitates analysis. Descriptive statistics was used to analyze the quantitative data.

#### **3.7.1 Descriptive Analysis**

The statistics known as descriptive analysis are those that provide details about a population or sample (Zikmund, 2003). Moreover, descriptive analysis can be defined as the transformation of raw data into an easily understandable format, followed by the reorganization, interpretation, ordering, and manipulation of data to organize descriptive information (Groenewald, 2010).

The average, percentage, and frequency distribution are only a few methods for condensing the data. To describe the descriptive statistics in this study, we would use frequencies and percentage; and their presented by tables and graphs.

### 3.8 Validity and Reliability of the Instruments

To ensure reliability of the research instrument, the questionnaires were prepared in advance and pre-tested using a small (15) number of respondents, randomly selected from target respondents. This is also assisted the removal of any ambiguities hence focused the questionnaire to collect data relevant to the study. The researcher also did Cronbach's alpha test to check reliability, of the questionnaire using SPSS v23. The reliability of the questionnaire is presented in the table 3.1 below indicates that the proposed constructs have a relatively high reliability, having a Cronbach's alpha value ranging from 0.715 – 0.822, which is considered as satisfactory. Nunally (1978) suggested that the minimum of 0.70 would be an acceptable level. Similarly, it has been stated on (Hair et al., 1998) that, a commonly used value for acceptable reliability is 0.70.

In addition, the researchers gave the questionnaire for advisor opinion to ensure validity of the data collection instrument. This involved going through the questionnaire in relation to the set objectives and making sure that they contain all the information that can enable answer these objectives.

**Table 3.1: Reliability Result of the Constructs**

No.	Variables	Cronbach's Alpha	No. of Items	Scale
1	Top Management support	0.702	11	1-5
2	Commitment	0.732	6	1-5
3	Communication	0.757	7	1-5
4	Regular budget	0.900	7	1-5
5	Resource related	0.721	6	1-5
6	Client or customer focus	0.782	7	1-5
7	Continuous Improvement	0.800	7	1-5

**Source: own survey (2023)**



### **3.9 Ethics Consideration**

During for a study of research, the researcher or data collector should not treat people unfairly or badly. He or she should not harm people, or use the information him/her discover in him/her research to harm them, or allow it to be used to do harm (Fisher, 2007). Thus, the researcher followed ethically and morally acceptable processes throughout the research process. The data were collected with the full permission of the participants and confidentially without disclosing the respondents' identity. According to Kumar and Kandasamy (2012) ethical consideration in research work are the following:

Right to choose: everyone has the right to determine whether or not to participate in a marketing research project.

Right to be informed: Research participants have the right to be informed of all aspects of a research task. Knowing what is involved, how long it takes, and what was done with the data, etc.

Right to Privacy: all consumers have right to Privacy.

The project quality management practices are essential to ensure that the project meets the expectations of the stakeholders and delivers the desired outcomes. However, there are also various challenges that affect the quality of the project, such as technical, financial, environmental, social, and political issues. The research paper has also apply the principles of project quality management, such as planning, assurance, control, and improvement, to evaluate the performance of the project and identify the gaps and areas for improvement. The research paper would contribute to the existing knowledge on project quality management and provide recommendations for enhancing the quality of the Bole Airport expansion project.

The expected outcome of this study is to provide insights and recommendations on how to improve PQM practices and overcome their challenges in the BAEP. The study would also contribute to the existing literature on PQM in construction projects, especially in developing countries. It would also have practical implications for the BAEP stakeholders and other similar projects in terms of enhancing their quality performance and customer satisfaction.

Project quality management (PQM) is a critical aspect of any project, especially in the construction industry. PQM aims to ensure that the project meets the requirements and expectations of the stakeholders, as well as the standards and regulations of the industry. However, PQM also faces many challenges, such as lack of resources, communication gaps, cultural differences, and changing customer needs.

One of the ongoing projects that requires effective PQM is the Bole Airport Expansion Project (BAEP) in Ethiopia. The BAEP is a mega project that aims to increase the capacity and efficiency of the Bole International Airport, which is the main hub for air transport in East Africa. The BAEP involves the construction of a new terminal, a new runway, a new cargo terminal, and other facilities. The BAEP is expected to be completed by 2024, and it has a budget of about \$345 million.

## Chapter Four

### Results and Discussion

#### 4.1 Analysis and discussion

In table 4.1. a total of 60 questionnaires papers of the 73 questionnaires papers were properly filled out and collected which gave response rate of 83%. Based on the study of effectiveness of project quality management practices and their challenges in Bole Airport Expansion Project.

**Table 4.1: Response Rate**

Questionnaires distributed	Questionnaires returned	Percent of Responses
73	60	83

Source: own survey questionnaire (2023)

#### 4.2 Descriptive Analysis of Sample Characteristics

The first section of the questionnaire demanded personal information from respondents. Table below shows the general characteristics of the respondents in terms of sex, age, education level, service year in the company, current position, and years of experience had in this field of respondents in the company;

**Table 4.2 : Demography of the study**

No.	Questions	Respondent		Total		
		Frequency	%	N	%	
1.	Sex	Female	25	41.7	60	100
		Male	35	58.3		
2.	Age	20 - 30	10	16.7	60	100
		31 - 40	26	43.3		
		41- 50	18	30.0		
		Over 50	6	10.0		
3.	Education Level	Degree	40	66.7	60	100
		Postgraduate	20	33.3		
4.	Service years in the project	Less than 5 yrs.	15	25.0	60	100
		6 -10 years	25	41.7		
		11 - 20 years	2	3.3		
		Over 20 years	16	26.7		
5.	Current Position	Contract Expert	11	18.3	60	100
		Coordinator	4	6.7		
		Project Manager	3	5.0		
		Quality Manager	1	1.7		
		Site Engineer	13	21.7		
		Site Inspector	20	33.3		
		Site Supervisor	8	13.3		

**Source: own survey questionnaire (2023)**

Demographic information of the respondents 'By gender', the majority (58.3%) of the participants in the survey were male, while only 41.7% were female. This indicates that there is an imbalance in the quality management of the Bole Airport Expansion Project. One possible suggestion to address this issue is to encourage more female involvement in project quality management practices.

Based on the information in the table above, the majority of the respondents are in the age group of 31-40 years old with 43.3% of the total respondents, followed by 30% in the age group of 41-50 years old. Only 16.7% of the respondents are in the age group of 20-30 years old, and 10% of the respondents are over 50 years old. Therefore, it can be concluded that the majority of the employees working on the project are in their thirties and forties.

Demographic information of the respondents 'By Qualifications', most of the respondents have a bachelor's degree or higher education. This indicates that they have sufficient knowledge and skills to perform their tasks and contribute to the project quality.

The demographic information of the respondents 'Years of service in Ethiopian Airlines'. The table indicates that 25% of the respondents had less than 5 years of experience, 41.7% had 6-10 years of experience, 3.3% had 11-20 years of experience, and 26.7% had over 20 years of experience. Therefore, it can be inferred that the majority of the participants had experience between 6-10 years.

The demographic information of respondents "By position in the Bole expansion project" shows the majority of respondents were project site inspectors 33.3%, followed by site engineers 21.7% and contract experts 18.3%. Only one respondent was a quality manager. This indicates that the project had a strong representation of senior and technical personnel who were directly involved in the project quality management practices and faced their challenges. Based on the result, one can infer that the respondents had sufficient knowledge and experience to provide reliable and valid feedback on the project quality management practices and their challenges in the Bole expansion project.

### 4.3 Questions regarding Quality Management Practices

**Table 4.3: Quality management practices**

No.	Questions	Respondent		Total		
		Frequency	%	N	%	
1.	Perception of quality	Competitive Advantage	15	25.0	60	100
		tool to increase profits	14	23.3		
		Elimination of defects	21	35.0		
		Other	10	16.7		
2.	Did the project provide the staff with inductions and trainings	Yes	40	66.7	60	100
		No	7	11.7		
		Not sure	13	21.6		
3.	If your answer for the above question is YES how often	Monthly	9	15.0	60	100
		Quarterly	4	6.7		
		Semi-annually	4	6.7		
		Yearly	17	28.3		
4.	Does the project have any International Quality Certifications	Yes	48	80.0	60	100
		No	2	3.3		
		Not sure	8	13.3		

**Source: own survey questionnaire (2023)**

According to Table 4.3. quality practice related questions, we can infer that the project team has a high level of awareness and understanding of the quality standards and requirements for the project deliverables. The majority of the respondents knew the importance of quality for the project and followed the quality plan and procedures.

## 4.4 Project quality management process

Assessments of each of the project quality process is obtained by using percentage of frequency distribution and responses of respondents under and results are discussed in the following sections.

### 4.4.1 Quality Planning questions

**Table 4.4:Quality planning**

No.	Questions	Type	Frequency	Percent
1.	The project scope is well-defined and aligns with the project objectives.	Strongly Agree	50	83.4
		Agree	6	10.0
		Neutral	2	3.3
		Disagree	0	0
		Strongly disagree	2	3.3
		Total	60	100
	The project scope is somewhat defines and aligns with the project objective	Strongly Agree	0	0
		Agree	30	50.0
		Neutral	28	46.7
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100
3.	The project scope needs further definition and alignment with the project objectives.	Strongly Agree	14	23.3
		Agree	34	56.7
		Neutral	8	13.3
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100
4.	The project scope is poorly defined and does not align with the project objectives.	Strongly Agree	0	0
		Agree	2	3.3
		Neutral	4	6.7
		Disagree	20	33.3
		Strongly disagree	34	56.7
		Total	60	100
5.	The project scope is completely undefined and does not align with the project objectives.	Strongly Agree	0	0
		Agree	4	6.7
		Neutral	6	10.0
		Disagree	21	35.0
		Strongly disagree	29	48.3
		Total	60	100

6.	The project plan is comprehensive aligned with the project objectives.	Strongly Agree	30	50.0
		Agree	28	46.7
		Neutral	2	3.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
7.	The project quality plan is regularly reviewed and updated to ensure it remains relevant.	Strongly Agree	26	43.3
		Agree	24	40.0
		Neutral	10	16.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
8.	The project plan includes all necessary tasks and resources and is aligned with the project objectives.	Strongly Agree	32	53.3
		Agree	24	40.0
		Neutral	4	6.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
9.	The project plan includes a detailed timeline and milestones for each task.	Strongly Agree	33	55.0
		Agree	25	41.7
		Neutral	2	3.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023)**

Table 4.4. illustrates that the respondents have agreed on applying the quality plan. Most of the response strongly agrees on well-defining and aligning the project scope, regularly reviewing and updating the quality plan, project plan includes all necessary tasks and detailed timeline. 83.4%, 43.3%, 53.3% and 55% respectfully. Overall, the table shows that quality planning is highly considered by the respondents in the expansion projects.

#### 4.4.2 Quality Assurance

**Table 4.5:Quality assurance**

No.	Questions	Type	Frequency	Percent
1.	Quality assurance processes and tools are in place to maintain the desired level of quality throughout the project.	Strongly Agree	34	56.7
		Agree	14	23.3
		Neutral	8	13.3
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100
2.	Quality assurance processes and tools are somewhat in place to maintain the desired level of quality throughout the project.	Strongly Agree	0	0
		Agree	24	40.0
		Neutral	26	43.3
		Disagree	6	10.0
		Strongly disagree	4	6.7
		Total	60	100
3.	Quality assurance processes and tools need further development to maintain the desired level of quality throughout the project.	Strongly Agree	0	0
		Agree	15	25.0
		Neutral	37	61.7
		Disagree	6	10.0
		Strongly disagree	2	3.3
		Total	60	100
4.	Quality assurance processes and tools are poorly developed and do not maintain the desired level of quality throughout the project.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	33	55.0
		Strongly disagree	19	31.7
		Total	60	100
5.	There are no quality assurance processes and tools in place to maintain the desired level of quality throughout the project.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	31	51.7
		Strongly disagree	21	35.0
		Total	60	100
6.	Consistently following quality assurance processes ensure the desired level of quality throughout the project.	Strongly Agree	24	40.0
		Agree	26	43.3
		Neutral	6	10.0
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100



7.	Integrating quality assurance processes into every stage of the project and having continuous improvement	Strongly Agree	29	48.3
		Agree	21	35.0
		Neutral	6	10.0
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100
8.	Quality assurance processes are regularly audited and improved based on feedback and data.	Strongly Agree	32	53.3
		Agree	28	46.7
		Neutral	0	0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

Source: own survey questionnaire (2023)

Table 4.5. shows that the majority of the respondents strongly agreed 79% they get desired level of quality when applying quality assurance into every stage of the project and all agree quality assurance are regularly improving based on feedbacks. While, 13.3% and 10% of the respondents were neutral. In addition, majority of the respondents strongly agreed on the integration of quality assurance in all stages of project.

#### 4.4.3 Quality Control

Table 4.6:Quality control

No.	Questions	Type	Frequency	Percent
1.	The project is closely monitored and controlled using data-driven metrics and tools to ensure it stays on track and within budget see.	Strongly Agree	35	58.3
		Agree	23	38.4
		Neutral	2	3.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	The project is somewhat monitored and controlled using data driven metrics and tools to ensure it stays on track and within budget.	Strongly Agree	0	0
		Agree	24	40.0
		Neutral	26	43.3
		Disagree	6	10.0
		Strongly disagree	4	6.7
		Total	60	100

3.	The project needs further monitoring and control using data driven metrics and tools to ensure it stays on track and within budget	Strongly Agree	0	0
		Agree	15	25.0
		Neutral	37	61.7
		Disagree	6	10.0
		Strongly disagree	2	3.3
		Total	60	100
4.	The project is poorly monitored and controlled, relying on subjective assessments and leading to delays and cost overruns.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	33	55.0
		Strongly disagree	19	31.7
		Total	60	100
5.	There is no monitoring and control in place, leading to complete chaos and failure of the project.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	31	51.7
		Strongly disagree	21	35.0
		Total	60	100
6.	Monitoring and controlling the project closely to ensure it stays on track and within budget.	Strongly Agree	18	31.7
		Agree	32	53.3
		Neutral	10	16.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
7.	Monitored and controlled the project closely using real-time data	Strongly Agree	19	31.7
		Agree	35	58.3
		Neutral	6	10
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023)**

Table 4.6. represents the agreement of effectively monitoring and controlling the project and using real time data in the AABIA expansion project ensures the project stays on schedule. The majority of respondents strongly agree to in quality controlling in project quality management. In doing so, it ensures success in the project performance.

## 4.5 Project quality management practices

### 4.5.1 Top Management Support

Table 4.7: Top Management Support

No.	Questions	Type	Frequency	Percent
1.	Top management provides clear direction and support for the project.	Strongly Agree	35	58.3
		Agree	17	28.4
		Neutral	6	10.0
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100
2.	Top management provides some direction and support for the project.	Strongly Agree	0	0
		Agree	27	45.0
		Neutral	33	55.0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
3.	Top management needs to provide more direction and support for the project	Strongly Agree	0	0
		Agree	25	41.7
		Neutral	35	58.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
4.	Top management provides little to no direction or support for the project	Strongly Agree	0	0
		Agree	0	0
		Neutral	4	6.7
		Disagree	33	55.0
		Strongly disagree	23	38.3
		Total	60	100
5.	Top management actively hinders the project's success.	Strongly Agree	19	31.7
		Agree	37	61.7
		Neutral	4	6.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
6.	Providing good connection between top management and employees	Strongly Agree	13	21.7
		Agree	34	56.7
		Neutral	9	15.0
		Disagree	2	3.3
		Strongly disagree	2	3.3
		Total	60	100

7.	Top management provides the necessary resources to complete the project successfully.	Strongly Agree	21	35.1
		Agree	29	48.3
		Neutral	2	3.3
		Disagree	6	10.0
		Strongly disagree	2	3.3
		Total	60	100
8.	Organization's top management evaluating quality performance	Strongly Agree	19	31.7
		Agree	29	48.3
		Neutral	10	16.7
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100
9.	Organization's top management accepting responsibility for quality performance	Strongly Agree	52	86.8
		Agree	2	3.3
		Neutral	2	3.3
		Disagree	2	3.3
		Strongly disagree	2	3.3
		Total	60	100
10.	Major department heads within the organization participating in the quality improvement process	Strongly Agree	19	31.7
		Agree	22	36.7
		Neutral	13	21.6
		Disagree	4	6.7
		Strongly disagree	2	3.3
		Total	60	100
11.	Quality issues reviewed in organization's management meetings.	Strongly Agree	15	25.0
		Agree	37	61.7
		Neutral	8	13.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023)**

Table 4.7. shows Top Management Support, in project quality management practices in Bole Airport Expansion Project were influenced by the connection and involvement of the top management. The table shows that the majority of the respondents strongly agreed on top management provides clear direction, accepting responsibility, and in evaluating quality performance. These findings show that the top management played a vital role in ensuring the success of the project quality management practices and overcoming the challenges faced by the project team.

## 4.5.2 Commitment

**Table 4.8: Commitment**

No.	Questions	Type	Frequency	Percent
1.	The project team is fully committed to the project's quality success.	Strongly Agree	36	60.0
		Agree	20	33.3
		Neutral	4	6.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	The project team is somewhat committed to the project's success.	Strongly Agree	3	5
		Agree	18	30.0
		Neutral	27	45.0
		Disagree	12	20.0
		Strongly disagree	0	0
		Total	60	100
3.	The project team needs to be more committed to the project's success	Strongly Agree	0	0
		Agree	9	15.0
		Neutral	43	71.7
		Disagree	8	13.3
		Strongly disagree	0	0
		Total	60	100
4.	The project team is not committed to the project's success.	Strongly Agree	0	0
		Agree	0	0
		Neutral	10	16.7
		Disagree	32	53.3
		Strongly disagree	18	30.0
		Total	60	100
5.	The project team actively works against the project's success.	Strongly Agree	0	0
		Agree	4	6.7
		Neutral	11	18.3
		Disagree	20	33.3
		Strongly disagree	25	41.7
		Total	60	100
6.	The organization's adapting to the new ideas that employees come up with.	Strongly Agree	28	46.7
		Agree	23	38.3
		Neutral	9	15
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

Source: own survey questionnaire (2023)

Table 4.8. shows the responses regarding the commitment of all participants in the project. The level of commitment of the project participants in Bole Airport Expansion Project positively affect the project quality. The table indicates that 60% of the respondents strongly agree on the commitment of the project team towards the success of the project quality, while 33.3% agreed.

In addition, majority of the respondents agree with the team’s commitment in the project. Therefore, it can be inferred that the majority of the respondents believe that the commitment of all participants in the project is crucial for the effectiveness of project quality management practices.

### 4.5.3 Communication

**Table 4.9:Communication**

No.	Questions	Type	Frequency	Percent
1.	Communication channels are open and effective, allowing for timely and accurate information sharing.	Strongly Agree	46	76.7
		Agree	14	23.3
		Neutral	0	0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	Communication channels are somewhat open and effective, but could be improved.	Strongly Agree	0	0
		Agree	32	53.3
		Neutral	28	46.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
3.	Communication channels need further development to be open and effective.	Strongly Agree	0	0
		Agree	0	0
		Neutral	34	56.7
		Disagree	26	43.3
		Strongly disagree	0	0
		Total	60	100
4.	Communication channels are poorly developed and hinder project progress.	Strongly Agree	0	0
		Agree	0	0
		Neutral	2	3.3
		Disagree	30	50.0
		Strongly disagree	28	46.7
		Total	60	100

5.	There are no communication channels in place, leading to complete chaos and failure of the project.	Strongly Agree	0	0
		Agree	0	0
		Neutral	10	16.7
		Disagree	22	36.4
		Strongly disagree	28	46.9
		Total	60	100
6.	Providing timely and accurate information sharing between project team.	Strongly Agree	34	56.7
		Agree	20	33.3
		Neutral	6	10
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
7.	Establishing communication links between employees and top management.	Strongly Agree	28	46.7
		Agree	23	38.3
		Neutral	9	15
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023)**

According to table 4.9. communication is one of the key factors that affect the effectiveness of project quality management. The table shows the importance of communication links established between employees and top management in the project. It indicates that most of the respondents with (76.7%) show communication channels are open and effective, (56.7%) show that they provide timely and accurate information and (46.7%) establishing communication links between employees and top management. agreed on having good communication during the project. This shows that effective communication between employees and top management is crucial for the success of the project. Additionally, the table shows that no respondents disagreed, indicating that communication is universally recognized as an important aspect of project quality management practices.

#### 4.5.4 Regular budget update

Table 4.10: Regular budget update

No.	Questions	Type	Frequency	Percent
1.	The project budget is regularly reviewed and updated to ensure it remains relevant and sufficient.	Strongly Agree	28	46.7
		Agree	26	43.3
		Neutral	4	6.7
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100
2.	The project budget is somewhat reviewed and updated to ensure it remains relevant and sufficient.	Strongly Agree	0	0
		Agree	25	41.7
		Neutral	33	55.0
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100
3.	The project budget needs further review and updating to ensure it remains relevant and sufficient.	Strongly Agree	0	0
		Agree	0	0
		Neutral	38	63.3
		Disagree	20	33.3
		Strongly disagree	2	3.3
		Total	60	100
4.	The project budget is poorly reviewed and rarely updated, leading to cost overruns and delays.	Strongly Agree	0	0
		Agree	0	0
		Neutral	10	16.7
		Disagree	22	36.3
		Strongly disagree	28	46.7
		Total	60	100
5.	There is no project budget in place, leading to complete chaos and failure of the project	Strongly Agree	0	0
		Agree	0	0
		Neutral	9	15
		Disagree	23	38.3
		Strongly disagree	28	46.7
		Total	60	100
6.	Non-delay of interim payments	Strongly Agree	27	45.0
		Agree	23	38.4
		Neutral	8	13.3
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100



7.	Having separate budget allocation for quality management	Strongly Agree	25	41.7
		Agree	20	33.3
		Neutral	11	18.3
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100

Source: own survey questionnaire (2023)

Table 4.10. shows regularly reviewing project budget ranked first with 46.7% strongly agree compared with the non-delay of interim payments. These problems indirectly affect the quality of the expansion project. Interim payments can be agreed in advance and paid, but they are more based on the value of work that has been completed. So, the delay of these payments may cause the construction to stop and cause lagging of the work. This can indirectly affect the quality of the expansion project because if work is delayed or stopped, it can cause other problems such as increased costs and reduced quality.

#### 4.5.5 Resource related

Table 4.11:Resource related

No.	Questions	Type	Frequency	Percent
1.	The project team has the necessary resources and skills to complete the project successfully.	Strongly Agree	38	63.3
		Agree	22	36.7
		Neutral	0	0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	The project team has some necessary resources and skills to complete the project successfully.	Strongly Agree	0	0
		Agree	18	30.0
		Neutral	38	63.3
		Disagree	4	6.7
		Strongly disagree	0	0
		Total	60	100
3.	The project team needs further resources and skills to complete the project successfully.	Strongly Agree	0	0
		Agree	0	0
		Neutral	34	56.7
		Disagree	24	40.0
		Strongly disagree	2	3.3
		Total	60	100

4.	The project team lacks necessary resources and skills, leading to delays and poor quality.	Strongly Agree	0	0
		Agree	0	0
		Neutral	0	0
		Disagree	28	46.7
		Strongly disagree	32	53.3
		Total	60	100
5.	The project team has no necessary resources or skills, leading to complete failure of the project.	Strongly Agree	0	0
		Agree	0	0
		Neutral	2	3.3
		Disagree	30	50.0
		Strongly disagree	28	46.7
		Total	60	100
6.	Providing necessary quality management training courses for labors	Strongly Agree	38	63.3
		Agree	20	33.4
		Neutral	2	3.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023)**

Table 4.11. shows the respondents' agreement on resource related issues in the AABIA quality management expansion project. The table indicates that 63.3% of respondents strongly agree with project team having the necessary resources and skills to complete the project successfully. Additionally, providing necessary quality management training courses for labors is rated 63.3%. Therefore, it can be inferred that the respondents consider providing quality management training courses for labors and providing the necessary skills as important factors in the AABIA quality management expansion project.

#### 4.5.6 Client or customer focus

Table 4.12: Client or customer focus

No.	Questions	Type	Frequency	Percent
1.	The project team is focused on meeting the needs and expectations of the client or customer.	Strongly Agree	21	35.0
		Agree	31	51.7
		Neutral	8	13.3
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	The project team is somewhat focused on meeting the needs and expectations of the client or customer.	Strongly Agree	0	0
		Agree	24	40.0
		Neutral	26	43.3
		Disagree	6	10.0
		Strongly disagree	4	6.7
		Total	60	100
3.	The project team needs to be more focused on meeting the needs and expectations of the client or customer.	Strongly Agree	0	0
		Agree	15	25.0
		Neutral	37	61.7
		Disagree	6	10.0
		Strongly disagree	2	3.3
		Total	60	100
4.	The project team is not focused on meeting the needs and expectations of the client or customer.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	33	55.0
		Strongly disagree	19	31.7
		Total	60	100
5.	The project team actively works against meeting the needs and expectations of the client or customer.	Strongly Agree	0	0
		Agree	0	0
		Neutral	8	13.3
		Disagree	31	51.7
		Strongly disagree	21	35.0
		Total	60	100
6.	The project team accepts customers feedback on quality and delivery performance	Strongly Agree	6	25.0
		Agree	37	61.7
		Neutral	15	10.0
		Disagree	2	3.3
		Strongly disagree	0	0
		Total	60	100

7.	Used customer complaints as input to improve the organizations quality.	Strongly Agree	0	35.0
		Agree	21	51.7
		Neutral	31	13.3
		Disagree	8	0
		Strongly disagree	0	0
		Total	60	100

**Source: own survey questionnaire (2023) Table**

In table 4.12. majority of the factors under the client or customer focus show a positive response. From the respondents 51.7% agreed with having the focus of the project team on meeting expectations of clients and on using customers complaints as input, 61.7% agreed on project team accepting customers feedback on quality. While some respondents were neutral with meeting needs of clients and feedback agreed its importance by 10%, whereas, using customers complaints as input by 13.3%. Therefore, it can be inferred that most agree on client or customer focus is an important aspect of the Bole Airport expansion project.

#### **4.5.7 Continuous improvement**

**Table 4.13: Continuous improvement**

No.	Questions	Type	Frequency	Percent
1.	The project team is committed to continuously improve the processes and outcomes of project quality.	Strongly Agree	29	48.3
		Agree	31	51.7
		Neutral	0	0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
2.	The project team is somewhat committed to continuously improving processes and outcomes.	Strongly Agree	0	0
		Agree	27	45.0
		Neutral	33	55.0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
3.	The project team needs to be more committed to continuously improving processes and outcomes	Strongly Agree	0	0
		Agree	23	38.3
		Neutral	33	55.0
		Disagree	2	3.3
		Strongly disagree	0	0

		Total	60	100
4.	The project team is not committed to continuously improving processes and outcomes.	Strongly Agree	0	0
		Agree	0	0
		Neutral	4	6.7
		Disagree	33	55.0
		Strongly disagree	23	38.3
		Total	60	100
5.	The project team actively resists changes and improvements, hindering project progress.	Strongly Agree	0	0
		Agree	4	6.7
		Neutral	6	10.0
		Disagree	26	43.3
		Strongly disagree	24	40.0
		Total	60	100
6.	Ensuring employees capability of adapting better ways of improving the project quality.	Strongly Agree	21	35.0
		Agree	39	65.0
		Neutral	0	0
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100
7.	Self-assessment processes taking place on a regular basis.	Strongly Agree	19	31.6
		Agree	37	61.7
		Neutral	4	6.7
		Disagree	0	0
		Strongly disagree	0	0
		Total	60	100

Source: own survey questionnaire (2023)

Table 4.13. shows the continuous improvement of project quality management in the AABIA expansion Project. It can be clearly seen that the majority of the respondents strongly agree having a continuous quality improvement is important. With (51.7%) agree the project team is committed to continuously improve the processes and outcomes of project quality and (65%) ensures employees capability of adapting better ways of improving the project quality. As well as (61.7%) agree with self-assessment processes taking place on a regular basis.

Therefore, it can be inferred that the majority of the respondents believe that having a continuous improvement in quality is crucial for the success of the project.

## **4.6 Effective quality project management practices' challenges**

Challenges to effective quality management practices in airport design include the insufficient client's involvement. Emphasizes the importance of program management for aviation projects, including quality management, to ensure successful project delivery. The report notes that challenges to effective program management include the complexity of aviation projects and the need for top management engagement. Another challenge to effective quality management practices in airport construction projects is the need for quality assurance management.

In summary, effective quality project management practices are essential for the success of airport construction projects, including the Bole Airport expansion project. However, these practices face several challenges, including clear understanding of quality management, top management involvement, complexity of aviation projects, and risk management.

## **Chapter Five**

### **Summary, Conclusion and Recommendation**

#### **5.1 Summary of the study**

With the construction of a new passenger terminal, a new VIP terminal, and other facilities to increase the airport's capacity and service quality, the Bole Airport expansion project in Addis Ababa, Ethiopia, is one of the country's largest and most complex infrastructure projects. The goal of this study was to evaluate the effectiveness of project quality management practices and their challenges. In order to develop a thorough and in-depth understanding of the project quality management procedures and problems, a quantitative approach was used in the study. Descriptive statistics were used in the study of the data. The study also identified the primary obstacles to and potential for enhancing project quality management methods, and it offered some suggestions for doing so as well as suggestions for additional research on the subject. According to the findings of the analysis for the project quality management practices of AABIA expansion project, the following summaries are made.

- Five of the seven factors believe that it is important to be involved in establishing project quality management, and responses on top management and client involvement were moderate.
- The three-core project quality management processes included quality planning, quality assurance, and quality control. The findings demonstrate that adopting quality plans and controls is viewed as a crucial component of project quality management, and that respondents generally held this opinion in high regard.
- The reply demonstrates that the client's requests are frequently involved in the project's success.
- The project's efficient interaction with the client, contractors, and other stakeholders. Understandings and punctuality were the outcomes of this.

## **5.2 Conclusion of the study**

The analysis came to the conclusion that the Bole Airport Expansion Project has succeeded in achieving its PQM goals and standards based on these findings. It demonstrated that PQM procedures have been somewhat adopted as part of the Bole Airport Expansion Project. The following were the main elements that the study determined affected how effective project quality management procedures were:

**Top management support:** The majority of respondents concur, according to the results, on the significance of senior management involvement in project quality management. However, the respondents provided mediocre responses when it came to taking accountability and helping to enhance the quality. The necessity of senior management participation in project quality management is often highly valued by respondents.

**Quality practice:** The findings showed that respondents concur that good practice is crucial to project quality management. Although there is generally a high level of agreement among the respondents, the respondents' responses on the particular issue of whether to apply quality assurance were inconsistent.

Overall, the results showed that, of the 7 variables, respondents agreed on the relevance of five of them, while they expressed no opinion on the two remaining variables. Top management participation and client participation are the two.

## **5.3 Recommendation**

Based on the study's results and conclusions, the following suggestions are made to enhance project quality management procedures and address the issues in the expansion of Bole Airport:

- To prevent ambiguity and uncertainty, project stakeholders should explicitly define and convey the idea of quality, its requirements, and expectations of the project deliverables.
- The project manager is responsible for ensuring that sufficient resources, including time, money, staff, tools, and materials, are allotted and used for quality planning, assurance, and control operations.
- In order to strengthen the staff's skills, the project team should administer a continuous training and development program to them quarterly.



- To find gaps and make improvements, management should regularly evaluate project quality management methods.
- The project team should foresee and address any potential risks or difficulties that could lower the quality of the project deliverables, such as resource shortages, timetable slippages, scope revisions, cultural inconsistencies, stakeholder conflicts, environmental problems, etc.
- The project team should leverage ICT to promote information sharing and collaboration, as well as improve teamwork and communication among all project participants and stakeholders.

#### **5.4 Future research**

- Conducting wider research including national and international projects to compare their project quality management practices
- Conducting further case studies on airport expansion projects to identify specific quality management practices that can be improved

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# **APPENDIX**

# **QUESTIONNAIRE**

**St. Mary University**

**School of Graduate Studies**

**Project Management Department**

**The Effectiveness of Quality Management Practices and their  
Challenges in Bole Airport Expansion project**

**Survey Questionnaire**

**Dear Respondents!**

For the sole purpose of doing research for a master's degree in project management, this questionnaire is intended to gather information about "**The Effectiveness of quality management practices and their challenges in Bole airport expansion project.**" Your truthful response will be critical in helping organizations understand precisely how construction practices relate to quality, which is the main goal of this survey. Additionally, it will offer potential solutions that might be used as management's input in further modifying the current project quality management procedures.

This questionnaire will have two main sections. The first section is on Demographic information of the respondents. The second section of the Questionnaire is on research questions. Finally, section three quality management practice. It will take approximately few minutes.

Thank you in advance for taking part in this endeavor.

Heran Mamo

## Section One: Demographic Characteristics and General Background of the Respondents

Please put a tick mark “✓” the one that represents you most appropriately.

### 1. Gender

- Male  Female

### 2. Age

- 20-30  31-40  
 41-50  Over 50

### 3. Qualification

- Certificate  Diploma  Degree  Postgraduate  PhD

### 4. How long have you been working in Ethiopian Airlines?

- Less than 5 years  6-10 years  11-20 years  Over 20 years

### 5. What is your role in the Bole expansion project?

\_\_\_\_\_

## Section Two. Quality Practices Related Questions

### 1. What is your perception of project quality management?

- Elimination of defects  A tool to increase profits  
 A competitive advantage  If Other, Please Specify \_\_\_\_\_

### 2. Does the project provide the staff with continuous trainings regarding project quality management?

- Yes  No  Not Sure

### 3. If your answer for question (2) is “YES”, how often?

- Monthly  Quarterly  Semi-annually  Yearly

### 4. Does the project have any International Quality Certifications?

- Yes  No  Not Sure

### Section Three: Quality Management Process

The following are practices of quality in the expansion project of Bole International Airport. Please indicate your level of agreement on the following statements regarding to your project

Please put a tick mark “✓” the one that represents you most appropriately. Using the keys (**Where: 1= Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree**)

#### 3.1 Quality Planning

	Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project scope is well-defined and aligns with the project objectives					
2.	The project scope is somewhat defined and aligns with the project objectives.					
3.	The project scope needs further definition and alignment with the project objectives.					
4.	The project scope is poorly defined and does not align with the project objectives.					
5.	The project scope is completely undefined and does not align with the project objectives.					
6.	The project plan is comprehensive aligned with the project objectives.					
7.	The project quality plan is regularly reviewed and updated to ensure it remains relevant.					
8.	The project plan includes all necessary tasks and resources and is aligned with the project objectives.					
9.	The project plan includes a detailed timeline and milestones for each task.					



### 3.2 Quality Assurance

	Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	Quality assurance processes and tools are in place to maintain the desired level of quality throughout the project.					
2.	Quality assurance processes and tools are somewhat in place to maintain the desired level of quality throughout the project.					
3.	Quality assurance processes and tools need further development to maintain the desired level of quality throughout the project.					
4.	Quality assurance processes and tools are poorly developed and do not maintain the desired level of quality throughout the project.					
5.	There are no quality assurance processes and tools in place to maintain the desired level of quality throughout the project.					
6.	Consistently following quality assurance processes ensure the desired level of quality throughout the project.					
7.	Integrating quality assurance processes into every stage of the project and having continuous improvement					
8.	Quality assurance processes are regularly audited and improved based on feedback and data.					

### 3.3 Quality Control

	Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project is closely monitored and controlled using data-driven metrics and tools to ensure it stays on track and within budget see.					
2.	The project is somewhat monitored and controlled using data-driven metrics and tools to ensure it stays on track and within budget.					
3.	The project needs further monitoring and control using data-driven metrics and tools to ensure it stays on track and within budget.					
4.	The project is poorly monitored and controlled, relying on subjective assessments and leading to delays and cost overruns.					
5.	There is no monitoring and control in place, leading to complete chaos and failure of the project.					
6.	Monitoring and controlling the project closely using data-driven metrics and tools to ensure it stays on track and within budget.					
7.	Monitored and controlled the project closely using real-time data.					

## Section Four: Quality Management Practice

### 4.1 Top Management Support

	Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	Top management provides clear direction and support for the project.					
2.	Top management provides some direction and support for the project.					
3.	Top management needs to provide more direction and support for the project.					
4.	Top management provides little to no direction or support for the project.					
5.	Top management actively hinders the project's success.					
6.	Providing good connection between top management and employees					
7.	Top management provides the necessary resources to complete the project successfully.					
8.	Organization's top management evaluating quality performance					
9.	Organization's top management accepting responsibility for quality performance					
10.	Major department heads within the organization participating in the quality improvement process					
11.	Quality issues reviewed in organization's management meetings.					

**4.2 Commitment of Project Participant**

Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1. The project team is fully committed to the project's quality success.					
2. The project team is somewhat committed to the project's success.					
3. The project team needs to be more committed to the project's success					
4. The project team is not committed to the project's success.					
5. The project team actively works against the project's success.					
6. The organization's management adapting to the new ideas that employees come up with.					

**4.3 Communication**

Questions	(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1. Communication channels are open and effective, allowing for timely and accurate information sharing.					
2. Communication channels are somewhat open and effective, but could be improved.					
3. Communication channels need further development to be open and effective.					
4. Communication channels are poorly developed and hinder project progress.					

5.	There are no communication channels in place, leading to complete chaos and failure of the project.					
6.	Providing timely and accurate information sharing between project team.					
7.	Establishing communication links between employees and top management.					

#### 4.4 Regular budget update

Questions		(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project budget is regularly reviewed and updated to ensure it remains relevant and sufficient.					
2.	The project budget is somewhat reviewed and updated to ensure it remains relevant and sufficient.					
3.	The project budget needs further review and updating to ensure it remains relevant and sufficient.					
4.	The project budget is poorly reviewed and rarely updated, leading to cost overruns and delays.					
5.	There is no project budget in place, leading to complete chaos and failure of the project					
6.	Non-delay of interim payments					
7.	Having separate budget allocation for quality management					

**4.5 Resource related**

Questions		(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project team has the necessary resources and skills to complete the project successfully.					
2.	The project team has some necessary resources and skills to complete the project successfully.					
3.	The project team needs further resources and skills to complete the project successfully.					
4.	The project team lacks necessary resources and skills, leading to delays and poor quality.					
5.	The project team has no necessary resources or skills, leading to complete failure of the project.					
6.	Providing necessary quality management training courses for labors					

**4.6 Client or customer focus**

Questions		(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project team is focused on meeting the needs and expectations of the client or customer.					
2.	The project team is somewhat focused on meeting the needs and expectations of the client or customer.					
3.	The project team needs to be more focused on meeting the needs and expectations of the client or customer.					

4.	The project team is not focused on meeting the needs and expectations of the client or customer.					
5.	The project team actively works against meeting the needs and expectations of the client or customer.					
6.	The project team accepts customers feedback on quality and delivery performance					
7.	used customer complaints as input to improve the organizations quality.					

#### 4.7 **Continuous improvement**

Questions		(1) Strongly Agree	(2) Agree	(3) Neutral	(4) Disagree	(5) Strongly disagree
1.	The project team is committed to continuously improve the processes and outcomes of project quality.					
2.	The project team is somewhat committed to continuously improving processes and outcomes.					
3.	The project team needs to be more committed to continuously improving processes and outcomes					
4.	The project team is not committed to continuously improving processes and outcomes.					
5.	The project team actively resists changes and improvements, hindering project progress.					
6.	Ensuring employees capability of adapting better ways of improving the project quality.					
7.	Self-assessment processes taking place on a regular basis.					

