ST. MARY'S UNIVERSITY

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MA IN PROJECT MANAGEMENT

Assessment of Project Quality management Practices: the Case of Oromia Engineering Corporation *(ECO)*

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DECLARATION

I, Geda Beyene, declare that this paper entitled "Assessment of Project Quality management Practices: The case of oromia Engineering corporation *(ECO) "* is my original work and that it has not been submitted partially or in full, by any other person in this or any other university and all materials used for this paper have been duly acknowledged.

Name of student (Researcher), Geda Beyene

Signature----------Date ----------

This Thesis has been submitted for examination with my approval as university Advisor

Name of Advisor: - ---------- (PHD) Signature Date. ----------

APPROVAL

As member of the board of examiners of the MA thesis open defense Examination, we certify that we have read, evaluated the thesis prepared by Geda Beyene and examined the candidate. We recommended that the thesis entitled "**Assessment of Project Quality management Practices: The case of Oromia Engineering corporation *(ECO)***" be accepted as partial fulfillment for the award of Master of Arts degree in project management.

Approved by Board of Examiners

Name of Advisor_____Signature_____Date_____

Name of Internal Examiner_____Signature_____Date_____

Name of External Examiner_____ signature _____Date_____

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ABBREVIATION AND ACRONYMS

ECO: Oromia Engineering Corporation

ISO: International Organization for Standardization

PMBOK: Project Management Body of Knowledge

PQM: Project Quality Management

TQM: Total Quality Management

WEDSWS: Water and Energy Design & Supervision Works Sector

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ABSTRACT

In today's extremely difficult and competitive engineering market, project quality management is crucial for a construction company to survive and achieve or exceed stakeholder needs. Many journals and Ethiopian media reveal that quality issue is the major constraints in many construction projects. No study investigated the project quality management of The case of oromia Engineering corporation (ECO). The purpose of this research is therefore to describe the project quality management practice in The case of oromia Engineering Corporation to identify potential gaps and offer suggestions to fill those gaps. The is a descriptive study involving 300 randomly selected employees of ECO using both primary and secondary sources of data, Questionnaires are used as a tool for primary data collection structured to address the three aspects of project quality management namely: quality planning, quality control and quality assurance. Secondary sources of data were obtained from relevant literature that covered thesis related to the case study. The finding shows that the management of The case of oromia Engineering corporation (ECO) is committed towards implementation of projects quality management. But it is revealed that the management is more committed to project quality planning processes than assurance and control. Furthermore, as per the analysis there is better communication of project quality information within the project team than between sections and with customers. Finally, it was found out that employees are trained but their involvement in project quality programs was not evident. Based on the findings the researcher recommends that organizations who are implementing project quality management to give equal emphasis to participation of top management to project quality planning, project quality assurance and quality control. Top management needs to ensure that employees at all levels of the organization are aware of project quality management and their contribution to it. The researcher also recommends that top management develop communication systems that allow free flow of quality information at all levels in the organization and between the organization and customers. Allow free flow of quality information at all levels in the organization and between the organization and customers.

Keywords: project quality management implementation factors

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The purpose of projects is to deliver results in order to accomplish goals. When project objectives are met, one of the following deliverables is produced: a distinctive product, a distinctive service or capability to offer a service, a distinctive outcome, or a distinctive combination of one or more of these. Regardless of the nature of the project's end result, project quality management is a specific branch of project management that applies to all projects (Gvozdenovic, Miljanovic, Jegdic, & Crnogorcic, 2008). Quality management, according to the Project Management Body of Knowledge Guide (PMBOK), is all about identifying and adhering to quality requirements, auditing the outcomes of quality control measurements, using quality measurements to control quality, and, if necessary, recommending project changes. (PMBOK, 2013)

As stated by Quality is not only a requirement in the contemporary environment of intense competition, but it also becomes a means of survival for all enterprises worldwide, claims ISO 8402, 1994. The administration of the project and the project's output are both covered under project quality management. In every situation, any or all project stakeholders may suffer severe consequences if product or project quality criteria are not met. It is more important to prevent and avoid low quality outputs than to measure and correct them. It is a component of each and every project management process, from the beginning of the project until its completion. Quality management is the continual monitoring and correction of faults, not only identifying them after they have occurred (ibid).

The processes and actions of the performing organization that establish quality policies, objectives, and responsibilities in order to ensure that the project will meet the needs for which it was undertaken are referred to as project quality management by PMBOK. Quality planning, quality assurance, and quality control are all included in the implementation of quality management in projects. The Project Management Institute defined quality management methods, and a number of tools and approaches were identified as being used in the implementation phase. These include: - flowcharting, benchmarking, design of experiments, cost

of quality, quality audits, inspection, control charts, praetor diagrams, statistical sampling, flowcharting, and trend analysis (ibid).

In today's extremely difficult and competitive construction market, quality management is crucial for an engineering company to survive. According to Harris and McCaffer (2001), quality management must create the conditions for the successful application of relevant tools, techniques, and procedures, which will result in a company's operational success. In an engineering company, quality management is a crucial function that is integrated into all managerial and operational procedures (Harris and McCaffer, 2001).

Any country's development depends on its engineering sector. The construction of physical infrastructure, such as buildings, roads, and bridges, can in many ways be used to gauge a country's economic growth. The development of construction and engineering projects requires a wide range of parties, varied procedures, stages, and levels of work, as well as a significant lot of input from both the public and private sectors, with the main goal being to bring the project to a successful end. Success in carrying out construction project development activities will largely depend on the caliber of the respective parties' managerial, financial, technical, and organizational performance, while also taking into account the associated risk management, the business environment, and economic and political factors (Takim, and Akintoye, 2002).

The case of oromia Engineering corporation (ECO) is a multi-disciplinary Engineering firm re-established in 2020, upgrading the former Oromia Water Works Design and Supervision Enterprise that were engaged in planning, Study, Design and Construction Supervision & Contract Administration of Water Supply, Irrigation, Dam, Hydropower, Building, and Road as well as Land Use Planning & Environmental Study and Laboratory Service since May 2006GC.

The corporation is now an Engineering Consulting, study and design, contract administration and construction supervision of infrastructure of projects Firm giving consultancy services in areas of Irrigation, Energy, Water Resources Study, Water Supply, Transport, Building, Urban Planning, Land Use & Environmental Study, Research, Training and Laboratory in organized manner under three divisions and two directorates. The five divisions are Irrigation & Energy Works Division; Water Resource & Supply Works Division; and Transport, Building & Urban Planning Works Division whereas, the two Directorates are Land Use & Environmental Study Directorate

and Research, Training & Laboratory Service Directorate. The Corporation found projects either through direct offer or through competition. In order to perform the projects to the level of exceeding the client expectation as well as to be strong competitor in the industries to the level of winning the bid and always getting its share of work, preparing & adopting professional productivity work norm has a paramount importance.

Work norm has a paramount importance for controlling quality, quantity of the works to be executed and actually executed, efficiency and effectiveness of employees and the corporation at large, and time and expenses for a given activities. In the other word, the work norm adds value on operational Excellency of the corporation. (PMI, 2017)

1.2 Statement of the Problem

According to the engineering and construction companies, quality management in construction projects should involve maintaining the required level of construction quality to satisfy customers and ensure the long-term competitiveness and viability of the companies' businesses (Tan & Abdul-Rahman, 2005). In today's extremely difficult and competitive engineering market, quality management is crucial for a construction company to survive (Harris and McCaffer, 2001). The achievement or exceeding of stakeholder needs and expectations is made possible by the application of project quality management.

According to numerous researchers, completing a building project on schedule, within budget, and with the desired quality can significantly please the customer, contractor, and consultant, and the project can be said to have been completed successfully. However, data shows that the majority of building projects in the nation don't reach their clients effectively. Therefore, quality must be valued equally with project scope, timeline, and cost from a significance standpoint. The project team must agree to scope changes, time extensions, and additional expenses if the stakeholders' demands and expectations are not met by the project's results or the project management quality. (Tan & Abdul-Rahman, 2005)

Many journals and Ethiopian media stated that quality issue is the major constraints in many construction projects. Based on the result from informal survey assessment and observation on the different sites, the majority of beneficiaries of the project raised many qualities complains and most of them are engaged in demolishing the interior design of the projects like road, bridge,

small irrigation dams etc. in Oromia Engineering Corporation to redesign based on their interest and also to provide their own solution for the quality problems they had face. This situation leads the researcher to assess quality performance of the development of project. and also, the researcher stands to study due to many rumors regarding to projects quality performances related to quality assurance and quality control are not fully exercised in low-cost construction projects in Oromia Engineering Corporation. The low-cost projects are implemented without the participation of the owners in the whole construction processes; consequently, low-cost projects in projects have quality problems. There for the research is conducted to assess the quality performance of the housing project in the case of The case of Oromia Engineering corporation.

1.3 Research Questions

The attempts to answer the following basic research questions.

- Does Oromia Engineering corporation (ECO) implement project quality management system?
- Does the top management of Engineering corporation (ECO) of Oromia take part in the execution of project quality management?
- Is Engineering corporation's (ECO) project quality management information properly communicated?
- Are the employees of Oroomia Engineering corporation (ECO) given quality management training?

1.4 Research Objective

1.4.1 General Objective

The general objective of the study is to assess how engineering Corporation of Oromia (ECO) has implemented Project Quality Management Works

1.4.2 Specific objective

- To describe the amount of involvement of The case of oromia Engineering corporation's (ECO) top management in the implementation of project quality management.
- To explain how The case of oromia Engineering corporation (ECO) communicates project quality management information.

- To discuss how The case of oromia Engineering corporation (ECO) staff were trained and involved in the implementation of project quality management.

1.5 Scope of the Study

The study assessed only the quality management practice of projects undertaken by The case of oromia Engineering corporation (ECO). The study covers the Projects undertaken by Oromia Engineering Corporation in the study. Focusing on the projects monitoring and evaluation practices, contests faced and is coping mechanism.

This research would be limited on assessing the monitoring and evaluation practice level of projects within an itemized questionnaire and identifying the sets of contests observed in monitoring and evaluation in the corporation. In addition, the study doesn't participate all the staff of the organization due to large number of employees. Only information on project quality management is collected from randomly selected staffs of the The case of oromia Engineering corporation (ECO).

1.6 Significance of the Study

Quality as one of the key factors of project success and taking in to consideration of previous studies indication of quality issues of projects undertaken in Ethiopia, this study was of much significance to all who are concerned with project success and the satisfaction of project stakeholders. The findings of the study will provide as lessons learned document for the company under study and a good base for further evaluation and improvement of any area of the quality management process.

1.7 Limitations of the study

It is difficult to say that one research study was hundred percent accurate and complete without any difficulties. No research study is complete in itself. It is also true of the present investigation. This study focuses on describe how The case of oromia Engineering corporation (ECO) has implemented Project Quality Management Works. Although the attempt has been made to address the objectives set forth using available resources and motivation in order to finalize this research, the effort of the researcher was not without bottlenecks. In this study, the first limitations were non-availability of participants specially to carry out interviews with leaders

was very difficult because they were engaged in different seasonal project work follow ups. Unwillingness of employee was another limitation, they are not comfortable to respond both the questionnaires and interviews freely, and the researcher had many questionnaire items returned unfilled or blank. As a solution the researcher had to look for the substitute so as to complete the sample from other respondents based on the plan and the pilot-test result then rearrange the investigation and administered questionnaires additionally.

1.8 Definition of key terms

Quality

Quality is the features of a product that makes it useful and satisfies the need and expectation of the user (Juran, 1999).

Project

Project is a temporary endeavor undertaken to create a Unique Product, Service or Result. A project is temporary in that it has a defined beginning and end in time with defined scope and resources. And it is unique in that in that it is not routine operation but a specific set of operations designed to accomplish a singular goal (PMBOK, 2013).

Project quality management

Project quality management is the process for ensuring that all project activities accomplished in every stage of the project are effective and making sure the project met the requirements of the customers and will satisfy their need (ibid).

Quality planning

Quality planning (QP) is a systematic process that translates quality policy into measurable objectives and requirements, and lays down a sequence of steps for realizing them within a specified timeframe (Juran, 1999).

Quality assurance

Quality assurance (QA) is defined as a procedure or set of procedures intended to ensure that a product or service under development (before work is complete, as opposed to afterwards) meets specified requirements (PMBOK, 2013).

Quality Control

Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client or customer (ibid).

1.9 ORGANIZATION OF THE STUDY

This study is organized into five chapters. The First Chapter deals with introduction that includes background of the study, statement of problem, research questions, general objective, specific objective, significance of the study, scope of the study, limitations of the study and definition of terms used in the study. The Second Chapter presents related literature reviews that provide the theoretical and empirical reviews. The Third Chapter deals with materials and methods of the study. The Fourth Chapter deals with data presentation, analysis and interpretation. Lastly, the Fifth Chapter presents the study summary, conclusion and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

*2.*1 THEORETICAL REVIEW

A project is defined as a brief activity started with the intention of producing a special good, service, or outcome in the project management body of knowledge guide (PMBOK Guide). A project has a clear start and finish. The project's termination occurs when its goals have been met, when it is terminated because it will not or cannot meet its goals, when there is no longer a need for it, or when the client decides to do so. Most projects are intended to produce a permanent effect, hence the term "temporary" often does not apply to the product, service, or outcome produced by the project. Every project produces a distinctive product, service, or outcome with a unique setting, design, conditions, and situations, as well as a variety of stakeholders (PMBOK, 2013).

According to Larson and Gray (2011), projects differ from other organizational endeavors in large part because they have the following characteristics: An established objective; A defined life span with a beginning and an end; Involve participation from multiple departments and professionals; Typically do something that has never been done before; Have specific time, cost, and performance requirements.

Projects are judged on their success, expense, and amount of time spent. In comparison to most employment, these triple constraints create a greater standard of accountability. These three also emphasize one of the core tasks of project management, which is to strike a balance between the trade-offs of time, money, and performance while ultimately meeting the needs of the client. (Larson and Gray, 2011)

2.1.1. Project Management

Application of knowledge, skills, tools, and procedures to project activities in order to achieve project requirements is known as project management. This knowledge application necessitates the efficient administration of the project management procedures, including initiating, planning, carrying out, overseeing, and closing. Project management entails determining and meeting requirements, corresponding with engaged stakeholders, and juggling project limitations, namely

scope, quality, time, and budget. These characteristics are correlated, meaning that if one changes, at least one other is likely to be impacted as well. There may be disagreements among project stakeholders as to which aspects are most crucial, making the situation more difficult. To produce a successful project, the project team must be able to evaluate the situation, balance the demands, and keep proactive communication with stakeholders (PMBOK 2013).

According to Oberlender, project management is the art and science of managing people, resources, money, and schedules in order to finish a given project on schedule and within budget. A project manager spends a lot of time organizing people and working with them to find problems and solutions. People are what can come up with ideas, spot problems, figure out solutions, communicate, and complete tasks. People are the project manager's most valuable resource as a result. Therefore, the project manager needs to establish positive working relationships with employees in order to take advantage of their finest skills (Oberlender, 2000).

Meredith & Mantel stated the emergency of project management for the development of new methods of management is due to forces of: the exponential expansion of human knowledge; the growing demand for a broad range of complex, sophisticated, customized goods and services; and the evolution of worldwide competitive markets for the production and consumption of goods and services. All these forces combine to mandate the use of teams to solve problems that used to be solvable by individuals (Meredith & Mantel, 2009).

2.1.2. Quality

Quality is defined in two ways by Juran (2009). First-class attributes are those of products that satisfy customers by meeting their needs. In this sense, quality is defined in terms of income, and higher quality is typically more expensive. The second quality is the absence of flaws, mistakes that call for rework, customer complaints, and claims. In this view, the definition of quality is cost-oriented, and higher quality is typically more affordable. Planning for quality, quality control, and quality improvement are three such managerial procedures that are heavily utilized in managing for quality, according to Juran. These procedures are referred to as the "Juran trilogy."

According to the ISO 9000 definition, quality is the sum of all the features and qualities that affect a product's or service's capacity to satisfy explicit or implicit needs. It indicates that the

pursuit of better standards of quality is customer-driven. Greater performance standards, quicker product development, greater technological levels, materials and processes pushed to their limits, lower contractor profit margins, and fewer defects/rejects are increasingly demands from customers.

Total quality management (TQM) is currently used to respond to customer requests. Total quality management is a constantly evolving method of incorporating different organizational components into the design, development, and production processes in order to provide products or services that are both affordable and completely acceptable to the final consumer. TQM is customer-focused from the outside and offers deeper levels of customer satisfaction. Internally, TQM lowers operational expenses and production line bottlenecks, improving organizational morale and enhancing product quality. (Kerzner, 2009)

2.1.3. Quality and the Triple Constraint

Time, money, and scope make up the "triple constraint" for the project. The success of the project and the project manager depend equally on each of the three components. When achieving project objectives, project managers often work to balance the three, but they may compromise on one or more of the three during project implementation to achieve project goals and please clients. Fourth among equals is quality. Given that quality is based on client requirements and that scope is as well, it might be most closely related to quality. This connection deals with the project's product's quality. The project's quality itself is an additional crucial quality factor. A quality product was produced if the processes are up to par with the scope requirements Quality procedures that respect budget and time restrictions (Kenneth, 2005).

2.1.4. Benefits of Quality

The advantages of high-quality project execution are numerous. First, a good project and product will satisfy customers. Beyond customer contentment, customer joy is the perception of greater value by a satisfied consumer than was initially thought. Cost savings are still another advantage. Quality procedures can save waste, boost productivity, and enhance supplies, all of which could result in a lower project cost than anticipated. Last but not least, improved products, better project results, and reduced costs directly translate into higher competitiveness in a market that is increasingly global (ibid).

2.1.5. Project Quality Management

As stated by the processes and actions of the performing organization that establish quality policies, objectives, and responsibilities in order to ensure that the project will meet the needs for which it was undertaken are included in project quality management, according to Lewis (2005). In order to apply the organization's quality management system within the context of the project, project quality management uses policies and procedures. When necessary, it also supports ongoing efforts to improve the performing organization's processes. The goal of project quality management is to make sure that all project and product requirements are satisfied. Project Quality Management addresses the management of the project and the deliverables of the project. It applies to all projects, regardless of the nature of their deliverables. Quality measures and techniques are specific to the type of deliverables being produced by the project. In the context of achieving ISO compatibility, modern quality management approaches seek to minimize variation and to deliver results that meet defined requirements. These approaches recognize the importance of:

Customer satisfaction: Analyzing, establishing, and managing requirements to ensure that they are satisfied in order to satisfy customer expectations. Compliance with specifications and suitability for usage are both necessary for this.

Prevention over inspection: The management of the project and its deliverables should be planned for, designed for, and built with quality in mind, rather than the other way around. Preventing errors typically costs significantly less than repairing them after they are discovered through inspection or use.

Continuous improvement: The PDCA (plan-do-check-act) cycle, first introduced by Shewhart and later modified by Deming, is the cornerstone of quality improvement. Additionally, quality improvement programs like Total Quality Management (TQM), Six Sigma, and Lean Six Sigma could raise both the management and output standards for a project.

Management responsibility: Success requires the participation of all members of the project team. Nevertheless, management retains, within its responsibility for quality, a related responsibility to provide suitable resources at adequate capacities.

Cost of quality (COQ). The term "cost of quality" refers to the entire cost of the conformance work as well as the nonconformance work that should be performed as a compensating effort since there is a chance that some of the needed work effort may not have been completed or may have been completed improperly on the initial try.

2.1.6. Quality Management Processes

2.1.6.1. Quality Planning

According to Juran (2001), quality planning is an organized procedure for creating products that guarantees the end product will satisfy the needs of the consumer. For the specific product being designed and supplied, the technological tools and procedures of quality planning are also incorporated. Four areas of poor quality were found by Juran. These include design, process, and operational gaps as well as knowledge gaps (i.e., a failure to comprehend the needs of the client). To ensure that the final quality gap is as small as possible, quality planning offers the procedures, methods, tools, and strategies necessary to close each of these component gaps.

According to Jurqan, quality planning has six steps i.e. Establish the project, Identify the customers, Discover the customer needs, Develop the product, Develop the process, Develop the controls and transfer to operations.

If the constituent quality gaps are to be closed, the first step—establishing the project—provides the explicit objectives, direction, and infrastructure needed. The following phase allows for the systematic identification of every consumer. If there is even the slightest amount of doubt, ambiguity, or ignorance among all the clients, it is impossible to bridge the understanding gap. The third step's discovery of consumer demands offers the thorough understanding necessary for a successful product design to address those needs. In order to prevent the final perception gap, it also evaluates consumer perceptions explicitly. The develop product step produces a design that is efficient in fulfilling the requirements by utilizing both high-quality planning tools and the technology of the specific sector. The operations gap is finally addressed by creating process controls that maintain the process's peak performance. A successful transfer of the plans to the operating troops is also necessary for the closure of the operational gap. When properly carried out, a solid transfer strategy will give operations all the procedures, methods, supplies, tools, expertise, etc. needed to consistently delight customers Lewis (2005)

2.1.6.2 Quality Control

According to Juran's definition from 2001, quality control is an all-encompassing managerial procedure for managing activities to promote stability—to avoid negative change and to "maintain the status quo." The quality control process assesses real performance, compares actual performance to goals, and takes action as needed to preserve stability. One of the three fundamental managerial procedures via which quality can be managed, according to Juran, is quality control (Juran, 1999).

2.1.6.3 Quality Control Vs Quality Assurance (Juran's view)

There are many similarities between quality assurance and control. Performance is assessed by each. Performance and goals are compared for each. They each act differently, yet they also are different from one another. The essential goal of quality control is to keep things under control. While an operation is in progress, performance is assessed and compared to the objectives. The operating forces receive and make use of the generated information. Verifying that control is being upheld is the basic goal of quality assurance. After an operation, performance is assessed, and the information that is obtained is given to the operating troops as well as anyone else who may need to know. Others could be senior, functional, or plant management, corporate workers, oversight organizations, clients, and the general public. The action that supplies the system—the control is planning for control (Gitlow, et al., 2005).

2.1.6.4 Quality Improvement

Improvement, according to Juran, 2017) is the deliberate instigation of favorable change and the achievement of previously unheard-of levels of performance.

The role of upper managers

As Juran, 2017) said it is difficult to attain quality leadership without the upper managers carrying out the following non-delegable roles. Participate in the Quality Council: Receive training in Quality Management, Approve the quality vision and policies, approve the major quality goals, establish the infrastructure, Provide resources:

Review progress: A major shortcoming in personal participation by upper managers has been the failure to maintain a regular review of progress in making quality improvements.

Give recognition: Recognition usually involves ceremonial events that offer highly visible opportunities for upper managers to show their support for quality improvement.

Revise the reward system, Serve on project teams, Face up to employee apprehensions

2.1.7 Project Quality Management Processes as described by Project Management

2.1.7.1 Plan Project Quality Management

Project Planning Defining the quality standards and/or requirements that apply to the project and its deliverables as well as outlining how the project will prove compliance with those standards and requirements is known as quality management. In terms of managing and validating quality throughout the project, it offers direction and advice. Alongside the other planning stages, effective planning should be carried out utilizing various inputs, tools, and methodologies results in various outputs when using the Plan Project quality management process (Kerzner, 2017).

2.1.7.2 Plan Project Quality Management Process Inputs

Project management plan, stakeholder registration, risk register, requirements documentation, enterprise environmental factors, and organizational process assets are among the project management papers used to carry out the project quality management process. Organizational quality policies, procedures, and guidelines, a quality policy, historical databases, and lessons learned from prior phases or projects are among the organizational process assets that have an impact on the plan quality management process (Kerzner, 2017).

2.1.7.3 Tools and Techniques used in Project Quality Management process

The tools and techniques used in the quality planning process are Cost-Benefit Analysis, Cost of Quality (COQ), Seven Basic Quality Tools (i.e., Cause-and-effect diagrams, flowcharts, check sheets, pare to diagrams, histograms, control charts and scatter diagrams), benchmarking, design of experiments, statistical sampling, meeting and other quality planning tools like brainstorming, force field analysis, nominal group technique, quality management and control tools. These tools are used to link and sequence the activities (Kerzner, 2017).

2.1.7.4 Plan Quality Management Process Outputs.

The following outputs are derived as a result of the project quality planning process. Quality Management Plan**,** Process Improvement Plan**,** Quality Metrics**,** Quality Checklists**,** and Project Documents Update: - project documents that may be updated include stakeholder register; responsibility assignment matrix; and WBS and WBS dictionary.

2.1.7.5 Perform Quality Assurance

Perform Quality Assurance is the process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used. The key benefit of this process is that it facilitates the improvement of quality processes. Perform quality assurance is an execution process that uses data created during plan quality management and control quality processes. Like the project quality planning process, the project quality assurance uses different tools and techniques to utilize different inputs and gives different outputs (PMI, 2017).

2.1.7.5.1 Inputs to project Quality Assurance

Most of the inputs used in the project quality assurance process are outputs of the project quality planning process. These include quality management plan, process improvement plan, quality metrics, and quality control measurements. In addition to the listed documents project documents may influence quality assurance work and should be monitored within the context of a system for configuration management (Gitlow, et al., 2005).

2.1.7.5.2 Tools and Techniques used in the project quality assurance process

The project quality assurance process uses the tools and techniques of the plan quality management and control quality processes, quality audit and process analysis. Other tools that are available be used include: - affinity diagrams, process decision program charts (PDPC), interrelationship digraphs, tree diagrams, prioritization matrices, activity network diagrams, matrix diagrams (Gitlow, et al., 2005).

2.1.7.5.3 Quality Audits

A quality audit is a structured, independent process to determine if project activities comply with organizational and project policies, processes, and procedures. Quality audit is used to: -

Identify all good and best practices being implemented;

Identify all nonconformity, gaps, and shortcomings;

Share good practices introduced or implemented in similar projects in the organization and/or industry;

Proactively aid in a positive manner to improve implementation of processes to help the team raise productivity; and

Highlight contributions of each audit in the lessons learned repository of the organization.

Quality audits may be scheduled or random, and may be conducted by internal or external auditors. Quality audits can confirm the implementation of approved change requests including updates, corrective actions, defect repairs, and preventive actions.

Process Analysis; Process analysis follows the steps outlined in the process improvement plan to identify needed improvements and examines problems experienced, constraints experienced, and non-value-added activities identified during process operation.

2.1.7.5.4 Outputs of Project Quality Assurance process

The outputs derived from the project quality assurance process are: - *Change Requests,* Project Management Plan Updates, Project Documents Updates, Organizational Process Assets Updates.

2.1.7.6 Project Quality Control

In order to evaluate performance and suggest necessary adjustments, project quality control involves tracking and documenting the outcomes of quality activity execution. Quality control determines the root reasons of subpar quality, takes action to eradicate them, and guarantees that the needs of important stakeholders are met. During the project's planning and execution phases, quality assurance should be used to give stakeholders confidence that their requirements are met, and quality control should be used during the project's execution and closing phases to formally demonstrate, with reliable data, that the sponsor's and/or customer's acceptance criteria have been met (PMI, 2017). The project management team should know the differences between the following pairs of terms i.e. Prevention and inspection, Attribute sampling and variables sampling, Tolerances a n d control limit.

2.1.7.6.1 Inputs used in Project Quality Control

Documents used as inputs for the project quality control are project management plan, quality metrics, quality checklists, work performance data, approved change requests, deliverables, project documents and organizational process assets. The organizational process assets that influence the control quality process include; the organization's quality standards and policies, work guidelines, and issue and defect reporting procedures and communication policies (Gitlow, et al., 2005).

2.1.7.6.2 Tools and Techniques used in Quality Control

The tools and techniques used in quality control processes include the seven basic quality tools, statistical sampling techniques, inspection and approved change requests review.

2.1.7.6.3 Outputs of project Quality Control Process

Using the inputs and tools and techniques stated above, the project quality control process gives quality Control Measurements, validated Changes, and verified deliverable, work performance information, change requests, updates to project management plan, project documents & organizational process assets. Project documents which may be updated as a result of the control process includes: - quality standards, agreements, quality audit reports and change logs, training plans and assessments of effectiveness; and process documentation, such as information obtained using quality management and control (Gitlow, et al., 2005).

2.2 EMPIRICAL REVIEW

2.2.1 Quality as a Tool

Quality has become a strategic weapon being used by companies. A company with good quality has the tendency to have market share above its competitors. Many manufacturing companies have realized the importance of quality. There are different ways of defining quality. 'Today there is no single universal definition of quality. Some people view quality as performance to standards; others view it as meeting the customer's needs or satisfying the customers' (Dan & Nada, 2010). In order to ensure total quality in manufacturing, the definition of quality needs to be defined from customers' perspectives. ISO defines quality as *the degree to which a set of inherent characteristics fulfills requirements.* To fulfill requirements is to meet customers' needs

and regulatory requirements. Today, the importance of quality is greater than it has ever been. The difference between one organization and another or between one product and another is generally perceived in relation to the product or service of the company. The questions many now ask is what is quality and how does it profit an organization (Goeff, 2001, p. 1).

2.2.2 Quality Performance

There are numerous studies that have examined the correlations between quality management practices and various performance measures. For example, a study (Talib et al., 2010) developed and proposed the conceptual framework and research model of TQM implementation in relation to company performance particularly in context with the Indian service companies. It examined the relationships between TQM and a company's performance by measuring the quality performance as a performance indicator. The theoretical model was proposed to help companies to gain a better understanding TQM practice by focusing on identified practices while implementing TQM in their companies.

Different indicators used for measuring organizational performance have been identified from literature. Most of the research (Prajogo and Sohal, 2004; Feng et al., 2006) agree that quality performance and innovation performance are indicators of organizational performance. Others (Lin et al., 2005; Zakuan et al., 2010) stated that employee satisfaction, business results and customer satisfaction are indicators for organizational performance. Research for quality management by Flynn et al. (1994) suggested that the inputs of the framework are quality management practices while quality performance represents outcomes. A study conducted by Jeng (1998) on ISO certified organizations in Taiwan examined the relationships between six quality practices and quality performance. It was found that customer focus was the least of the practices. An empirical study carried out by Arumugam et al. (2008) on the relationship of TQM practices and quality performance on manufacturing companies in Malaysia through multiple regression and correlation analyses showed that there was partial correlation of the quality practices with quality performance.

The results of a study (Galloway, 2007) indicate that a firm's ability to track the status and financial outcomes of all Six Sigma projects, the maturity of the implementation, the selection of strategically-aligned projects, the integration of Design for Six Sigma (DFSS) into projects, and

the breadth of the implementation have a statistically significant impact on subjective and/or objective performance measures. In another research study (Arumugam et al., 2009), it was revealed that the strengths of an organization's quality management implementation lie in customer focus and process management. It was also concluded that there existed a satisfactory level of practices in leadership, strategic planning, human resource development and management. On the other hand, supplier relationship and information and analysis both received only moderate scores. It was suggested that more focus be put on improving supplier quality and relationship management and the information distribution system.

Massoud and Seyd, 2013, on their study investigate Critical success factor for TQM implementation in Libyan Iron and steel company, to improve the performance and identify the main impediments of implementing TQM successfully. They used questionnaire Survey and semi-structured interviews. The finding of this research revealed that critical success factors for implementing total quality management in Libyan Iron and steel company are: Education and Training, Supplier quality management, Employee Empowerment, Vision and Plan statement, Recognition and Reward and Customer Focus. This research identified government influence Poor vision statement, Lack of a detailed plan towards implementation of TQM, lack of top management commitment prevents Libyan Iron and steel company from implementing TQM successfully (Massoud and Seyd,2013).

The study undertaken by Ofori to identify and assess the quality of project management practices as well as the critical success factors for projects in Ghana, indicated that the critical factors that contribute to the success of a project include top management support, effective communication, clarity of project purpose and goals, and stakeholder involvement. The study adopted an exploratory approach and utilized a survey method to collect data on project management practices of Ghanaian organizations. It is also mentioned that documentation and dissemination of critical success factors and best practices in project management will improve the quality of project management in Ghana (Ofori, 2013).

A study by Teena, 2005 was made with the intension of providing clients, project managers, designers, and contractors with necessary information needed to better manage the quality of a construction building projects by identifying the factors that affect process quality of construction projects and to rank them by degree of importance. A questionnaire-based survey

was used to find out the attitude of contractors and consultants towards factors affecting quality of construction project.

The results of the study show that the factors which affect quality are Design, Lack of communication, Conformance to codes and standards, selection of designer, co-operation of parties, management factors, selection of contractor, top management support, labor, execution, material, equipment, financial issues, quality and safety systems, contract documents. (Tenna, 2014)

Based on the findings of the preliminary study by Keng and Hamzah on the implementation of quality management in construction projects in the context of construction industry in Malaysia, several points are preliminarily concluded: Total quality management is not a common practice; ISO registration is mainly for marketing purpose; Implementation of quality management is greatly perceived as a mean to fulfill contractual obligations instead of satisfying the needs of clients; In terms of quality management tools and techniques, construction companies are commonly using the traditional methods such as experiments and inspections. Other methods might be used depend on the individual practices of a company or requirements from client/consultants; Leadership and participation of top management of construction companies in quality management need to be strengthened; Allocation of financial and human resources for the purpose of problems of the implementation of quality management should be further increased; Finally the study stated that most of the quality management implementation problems encountered elsewhere are relevant in the context. (Keng & Hamzah, 2011)

The Research made by Birhanu Beshah on Quality Management and Engineering Practice and Challenges in Ethiopia, quality management practices in Ethiopia was found to be low in all the views including leadership, policy and strategy, resources management, process management, customer satisfaction, business performance and impact on society. Among these factors, policy and strategy is the most critical problem area despite the least weight given by the major quality awards and EQA. Comparatively, the service industries quality management practice is weaker than that of the manufacturing industries as measured by all the quality parameters. As stated by the researcher, the reasons for poor quality practice are basically two: The first one is lack of awareness about the basic concepts of quality. The second reason is that the customers' knowledge about quality is not adequate. Customers do not impose quality as a requirement on

the part of the industries. As far as the finding of this research is concerned, so far, there is no planned intervention to develop the knowledge of customers that most probably would lead to quality improvement in the industries (Birhanu Beshah, 2011).

Reza, Allahvirdi, Mohammad had researched on the Relationship between Total Quality Management Critical Success Factors and Knowledge Sharing in a Service Industry. According to the statistical results of their study, the explicit and tacit knowledge sharing improvements led to promoting CSFs of TQM. Considering the results of the case study, the most related TQM CSFs with knowledge sharing were leadership and commitment, supplier management, competitive benchmarking, teamwork, training, customer focus, communication, get thing right first time and process improvement (Reza, Allahvirdi, Mohammad, 2014).

A study was made by Ephantus, Hellen & Joseph with the aim of determining the factors influencing implementation of TQM and their influence in implementation of TQM. The study was based on four objectives: The first objective was to establish how Top Management Commitment influences implementation of TQM in Construction Companies in Rwanda. The study concluded that top management commitment is a critical factor in implementation of TQM. It was further concluded that top management commitment has a positive influence on implementation of TQM. This means that with increased top management commitment, the implementation of TQM is likely to be more successful. The second objective of the study was to investigate the extent to which Employee's Training influence implementation of TQM in Construction Companies in Rwanda. The study concluded that an employee training is a critical factor in implementation of TQM. The study further concluded that employee training has positive influence on implementation of TQM. This means that employee training can be used to enhance implementation process of TQM (Ephantus, Hellen & Joseph, 2015)

Secondary data analysis was made by Heena & Darshana to identify the critical success factors for TQM in manufacturing sectors. A total of 46 research papers (published between years 1994 to 2013) were selected and used to identify CSFs using Pareto analysis. The paper reviewed both studies on CSFs of TQM as well as TQM performance studies. After Pareto analysis of 21 CSFs, Pareto chart shows that first 13 "vital few" CSFs accounted for 80 percent frequency of occurrence and remaining 8 "useful many" CSFs accounted for only 20 percent frequency of occurrences. Regarding consistencies, the present study showed that 6 out of this 13 "vital few"

factors stand out in several studies as being more central for manufacturing sector. As per the analysis, these six factors are: top management commitment, Customer focus, Employee Involvement, Education & Training, Supplier quality management, and Human resource management (Heena & Darshana, 2015)

2.3 Research gap

The im-depth review of theoretical and empirical literatures presented above provide the different quality management practices conducted in different countries. Few studied done in Ethiopia involved more of non-governmental companies involved construction companies in a limited circumstance. Therefore, to fill this gap this study aimed to assess project quality management practices of government owned Construction Corporation with respect to project quality management knowledge areas.

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CHAPTER THREE

RESEARCH METHODOLOGY

INTRODUCTION

This chapter deals with the research design and methodology of the study. Collection of both Primary data through a structured questionnaire survey. Then, processed, analyzed, and interpreted accordingly in order to obtain key inputs to help undertake the study on Assessment of Project Quality management Practices: The Case of The case of oromia Engineering corporation.

3.1. Research Design

As stated from the outset, the purpose of this study was Assessment of Project Quality management Practices: The Case of The case of oromia Engineering corporation. To this end, the research design is structured to conduct the main research study with utmost precautionary manner. The difficult problem that follows the task of defining the research problem was the preparation of the design of the research project, popularly known as the "research design". Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. "A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy and procedure." In fact, the research design is the conceptual structure within which research is conducted and constitutes the blueprint for the collection, measurement, and analysis of data. As such the design includes an outline of what the researcher was done from writing the hypothesis and its operational implications to the final analysis of data. (C.R. Kothari, 2004).

As this research is a descriptive study & explanatory research design was used in this study. The state of affairs illustrating the present could use a descriptive research design. Explanatory research designs could use to both explain why a particular phenomenon occurs and to make predictions about what will happen in the future. Based on the sample population, try to infer the

population. Therefore, based on the objectives of the study, this research would be employed descriptive research design.

3.2. Research Approach

Two basic research approaches, that are, quantitative and qualitative research, are used in this study. A mixed approach would be used, which combines a quantitative and qualitative study approach. While the methodology of quantitative research is based on the description of data, the methodology of qualitative research is based on key informant interviews. A quantitative approach is statistically based and it contains questionnaires that can best be answered in numbers to get quantitative data. They analyze the numbers with a statistical model to see what the data tells them. The application of quantitative approaches facilitated the acquisition of adequate, relevant and reliable data that would be used to the Assessment of Project Quality management Practices the Case of The case of oromia Engineering corporation.

A mixed approach is an approach, which combines both qualitative and quantitative one is used to help minimize the weakness of the use of a single method and ensure the validity of gathered data. The other, data from the primary and secondary sources are collected and combined with the mixed approach which includes both qualitative and quantitative data type of source for the main reason behind employing mixed approach is, for the purpose of triangulation & extensiveness.

For this intention, a both qualitative and quantitative data collection method was employed to obtain reliable data and information from respondents, and leaders.

3.3. Sample Design

Sample design contains determining population size, sampling unit, sampling frame, sample size, and technique of sampling for the study.

3.3.1. Target Population

According to Rahi (2017), a targeted population as consisting of the complete group of elements (people or objects) that are identified in the investigation based on the objectives of the study. In doing these, the target populations for this study are 1200 employees who work in the Oromia Engineering Corporation.

3.3.2. Sampling frame

According to Kothari (2014), a sample frame can be defined as a list of all units in the population from which research samples were selected. The sample frame of this study was a list of all the elements in the population from which the sample was drawn. Therefore, the sample frame of this study included list the organization employees and officials who work in the office.

3.3.3. Sample Size

The sample size refers to the number of items to be selected from the universe to constitute a sample (Kothari, 2004). The sample size of 300 from the 1200 staff members of the ECO was obtained using Taro Yamane (1967) formula.

$$n = \frac{N}{1 + N(e)^2}$$

Where: n=number of sample size

N=Number of total targeted population

e= Margin error at 5 % (0.05) and at 95% confidence level

$$n = \frac{N}{1+N(e^2)} \quad n = \frac{1200}{1+1200(0.5^2)}$$

$$n = \frac{1200}{1+1200(0.0025)}$$

$$n = \frac{1200}{1+3}$$

$$n = \frac{1200}{4}$$

n = 300

3.3.4. Sampling technique

The study used systematic random sampling probability sampling to select the 300 participants from the 1200 total employees . To have good representation of the management officials proportional sampling method was used with 10% of the sample was from the management officers.

3.4. Methods of Data Collection

The primary data was gathered by open and closed-ended questionnaires.

3.5. Method of Data Analysis and Presentation

Data collected were entered into SPSS version 23 for analysis. Descriptive statistics was used to present the data with frequency tables, percentage and mean values.

Descriptive analyses were one of the important methods to summarize the data collected from the field of clearly and concisely discussing the findings of the research. The quantitative Data are analyzed by percentage, Frequency of appearance, and tables were used to examine and understand the General Conditions of the results of sampled respondents. The quantitative data were consistently organized and presented in a descriptive and narrative form.

3.6. Reliability

Reliability test was conducted to check the stability and consistency of the data by using Cronbach alpha method. Questionnaires were prepared in a way that they are closely related to research question and appropriate and careful data collection method were used. Cronbach's Alpha test of reliability was calculated using SPSS version 23 software (Taber, 2018). According to McMillan and Schumacher (2010), a good rule of thumb is that Cronbach's Alpha needs to be 0.7 or higher. In the current study, a Cronbach alpha 0.8 was obtained showing very good reliability.

3.7. Validity

Validity is concerned with the extent to which a measurement is close to the true value of the parameter. It also means whether a given finding of the study is genuine or occurred by hidden

determinant. Validity of this study was ensured by pretesting the questionnaire, using standardized tools and by making sure the sampling techniques are free from bias by giving each subject an equal opportunity to score. The questionnaires are comprehensive to cover all the variables being measured.

3.8. Ethical Consideration

The researcher obtained authorization from the management of Oromia Engineering Corporation (ECO) before carrying out the research. A letter from St. Mary University was given to the company before data collection. All information obtained in this research were strictly used for academic purposes and respondents were assured of the confidentially of information given where necessary.

CHAPTER FOUR

DATA FINDINGS AND ANALYSIS

This chapter describes the analysis and interpretation of the collected data. all the 300 questionnaires distributed to employees of The case of oromia Engineering corporation (ECO) questionnaires were able to be returned. The data was analyzed using SPSS version 23.

4.1 Primary data analysis

In this study, information on project quality management practice of The case of oromia Engineering corporation (ECO) water sector was gathered through questionnaires. Descriptive statistical analysis method was used to see the practice of project quality management. The factors tried to be checked in this study are top management participation (on processes of quality planning, quality assurance and quality control), communication of project quality information and employees training and participation in project quality management. The questionnaire contained six questions on quality management, five questions on quality assurance and a total of sixteen questions on quality control.

Part One: Characteristics of the Respondents

Table: 4. 1, **Gender of respondent**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	11	3.7	3.7	3.7
	male	131	43.7	43.8	47.5
	female	157	52.3	52.5	100.0
	Total	299	99.7	100.0	
Missing	System	1	.3		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the given data, there were 300 respondents in total 131 (43.7%) respondents identified as "male," representing 43.7% of the total respondents. 157 respondents identified as "female," representing 52.3% of the total respondents.

Table: 4. 2. **Department of the respondents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Projects	169	56.3	56.7	56.7
	Marketing	70	23.3	23.5	80.2
	Quality assurance	59	19.7	19.8	100.0
	Total	298	99.3	100.0	
Missing	System	2	.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Out of the valid responses, 169 (56.3%) mentioned that they are working "Projects," 70 (23.3%) mentioned "Marketing," and 59 (19.7%) mentioned "Quality assurance." The cumulative percent represents the running total as percentages add up.

Table: 4.3. **Position of the respondents**

Position of the respondents		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Top management	22	7.3	7.3	7.3
	Technical staff	181	60.3	60.3	67.7
	Support staff	97	32.3	32.3	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

From the given data, we can analyze the position of the respondents as follows: - Top management: 22 respondents, accounting for 7.3% of the total sample. This indicates that a minority of respondents hold top management positions within their organizations. - Technical staff: 181 respondents, representing the majority with 60.3% of the total sample. This suggests that the majority of respondents are technical staff members within their organizations. - Support staff: 97 respondents, making up 32.3% of the total sample. This indicates that a significant portion of the respondents have support staff roles within their organizations. The cumulative percent column shows the progressive increase in the percentages. In this case, the cumulative percent for each category reaches 100%, indicating that the total number of respondents equals

300. Overall, most of the respondents (60.3%) are technical staff, followed by support staff (32.3%), while top management comprises a smaller fraction (7.3%) of the total sample.

Part two: Questioner's responses

Table: 4.4. The project team develops a comprehensive plan for managing quality throughout the project lifecycle.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	11	3.7	3.7	3.7
	Agree	56	18.7	18.7	22.3
	Not decided	19	6.3	6.3	28.7
	Disagree	79	26.3	26.3	55.0
	Strongly Disagree.	135	45.0	45.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

According to the data provided, 3.7% of respondents strongly agree that the project team develops a comprehensive plan for managing quality throughout the project lifecycle, while 18.7% agree with this statement. Furthermore, 6.3% of the respondents have not yet decided on their opinion, 26.3% disagree, and the majority, 45%, strongly disagrees. Overall, it appears that there is a significant portion of respondents who do not believe that the project team effectively manages quality throughout the project lifecycle. This may indicate a potential issue with quality management practices within the organization or project team. Additional analysis and investigation may be needed to understand the reasons behind these perceptions and identify potential areas for improvement.

Table: 4.5. **The quality objectives clearly defined and aligned with the overall project objectives in the quality management plan?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	2.7	2.7	2.7
	Agree	42	14.0	14.0	16.7
	Not decided	49	16.3	16.3	33.0
	Disagree	55	18.3	18.3	51.3
	Strongly Disagree.	146	48.7	48.7	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, most respondents (48.7%) strongly disagree that the quality objectives are clearly defined and aligned with the overall project objectives in the quality management plan. Additionally, 18.3% of respondents disagree with this statement, while 14.0% agree and only 2.7% strongly agree. Around 16.3% of respondents have not decided on the matter. Overall, these results indicate that there is a significant skepticism or lack of confidence among the respondents regarding the alignment of quality objectives with the overall project objectives in the quality management plan. It suggests that there may be a need to reassess or improve the clarity and alignment of the quality objectives to gain greater support and agreement from the project team.

Table: 4.6. The project team establishes appropriate quality metrics and measurement criteria to evaluate the project's performance against the quality objectives?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	2.0	2.0	2.0
	Agree	66	22.0	22.0	24.0
	Not decided	27	9.0	9.0	33.0
	Disagree	59	19.7	19.7	52.7
	Strongly Disagree	142	47.3	47.3	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be concluded that: 2% of respondents strongly agree that appropriate quality metrics and measurement criteria have been established to evaluate the project's performance against quality objectives. 22% of respondents agree that appropriate quality metrics and measurement criteria have been established to evaluate the project's performance against quality objectives. 9% of respondents have not decided on the establishment of appropriate quality metrics and measurement criteria. 19.7% of respondents disagree that appropriate quality metrics and measurement criteria have been established to evaluate the project's performance against quality objectives. 47.3% of respondents strongly disagree that appropriate quality metrics and measurement criteria have been established to evaluate the project's performance against quality objectives.

Overall, the majority of the respondents either disagrees or strongly disagree that appropriate quality metrics and measurement criteria have been established to evaluate the project's performance against the quality objectives. This indicates a potential concern or lack of confidence in the project's ability to evaluate and measure its performance in terms of quality.

Table: 4.7. Did the project team conduct regular reviews and assessments to evaluate the effectiveness of quality assurance activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	10	3.3	3.4	3.4
	Agree	59	19.7	19.9	23.2
	Not decided	44	14.7	14.8	38.0
	Disagree	77	25.7	25.9	64.0
	Strongly Disagree	107	35.7	36.0	100.0
Total		300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the provided data, it appears that the project team did not conduct regular reviews and assessments to evaluate the effectiveness of quality assurance activities. Only 3.4% of respondents strongly agreed that regular reviews and assessments were conducted, while 19.9% agreed to some extent. However, a significant portion of respondents (25.9%) disagreed that regular reviews and assessments were conducted, and the majority of respondents (36.0%) strongly disagreed. Additionally, 14.8% of respondents were not able to provide a clear answer,

indicating uncertainty or lack of awareness regarding the frequency of these reviews and assessments. Overall, the data suggests that there may have been a lack of emphasis on evaluating the effectiveness of quality assurance activities within the project team.

Table: 4.8. Was the quality management plan communicated effectively to all project stakeholders?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	1.0	1.0	1.0
	Agree	64	21.3	21.3	22.3
	Not decided	37	12.3	12.3	34.7
	Disagree	71	23.7	23.7	58.3
	Strongly Disagree	125	41.7	41.7	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be seen that the quality management plan was not effectively communicated to all project stakeholders. Only 1% of respondents strongly agreed that the plan was effectively communicated. 21.3% of respondents agreed that the plan was effectively communicated. 12.3% of respondents were not decided on the effectiveness of communication. 23.7% of respondents disagreed that the plan was effectively communicated. 41.7% of respondents strongly disagreed that the plan was effectively communicated. Overall, the majority of respondents (65.4%) either disagreed or strongly disagreed that the quality management plan was effectively communicated to all project stakeholders. This indicates that there is room for improvement in effectively communicating the plan to stakeholders.

Table: 4.9. There is free flow of quality management information between different sections of your organization.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	12	4.0	4.0	4.0
	Agree	71	23.7	23.7	27.7
	Not decided	33	11.0	11.0	38.7
	Disagree	77	25.7	25.7	64.3
	Strongly Disagree	107	35.7	35.7	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the given data, we can analyze the responses to the statement "There is free flow of quality management information between different sections of your organization." 4% of the respondents strongly agree that there is free flow of quality management information. 23.7% of the respondents agree that there is free flow of quality management information. 11% of the respondents are not decided about the free flow of quality management information. 25.7% of the respondents disagree that there is free flow of quality management information. 35.7% of the respondents strongly disagree that there is free flow of quality management information.

Based on these responses, it can be concluded that a significant number of respondents (61.4%) either disagree or strongly disagree that there is free flow of quality management information between different sections of the organization. This indicates that there may be communication and information sharing issues within the organization. It is important for the organization to address this concern in order to ensure smooth and effective quality management processes.

Table: 4.10. The project team effectively identifies and document all relevant quality requirements and standards?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	4	1.3	1.3	1.3
	Agree	56	18.7	18.7	20.0
	Not decided	39	13.0	13.0	33.0
	Disagree	100	33.3	33.3	66.3
	Strongly Disagree.	101	33.7	33.7	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the given data, we can analyze the effectiveness of the project team in identifying and documenting all relevant quality requirements and standards. 1.3% of respondents strongly agree that the project team effectively identifies and documents all relevant quality requirements and standards. This indicates a small number of individuals who are confident in the team's ability to meet these requirements. 18.7% of respondents agree with the statement. This suggests that a larger portion of the participants believe that the project team is somewhat effective in identifying and documenting the necessary quality requirements and standards. 13.0% of respondents have not decided on the effectiveness of the project team in this area. This could imply uncertainty or lack of knowledge about the team's processes and capabilities. 33.3% of respondents disagree that the project team effectively identifies and documents all relevant quality requirements and standards. This indicates a significant number of individuals who have doubts or concerns about the team's ability to meet these requirements. Similarly, 33.7% of respondents strongly disagree with the statement. This suggests that there is a substantial number of participants who strongly believe that the project team does not effectively identify and document the necessary quality requirements and standards.

Overall, the data shows that a majority of respondents (66.3%) either disagree or strongly disagree with the statement, indicating a lack of confidence in the project team's ability to meet the relevant quality requirements and standards. This suggests that improvement is needed in this aspect and further efforts should be made to address this issue.

Table: 4.11. All employees in your organization are involved in quality management programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	2.0	2.0	2.0
	Agree	64	21.3	21.3	23.3
	Not decided	22	7.3	7.3	30.7
	Disagree	88	29.3	29.3	60.0
	Strongly Disagree.	120	40.0	40.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the provided data, the distribution of responses on employees' involvement in quality management programs can be analyzed as follows: 2.0% of employees strongly agree that all employees in the organization are involved in quality management programs. 21.3% of employees agree that all employees in the organization are involved in quality management programs. 7.3% of employees have not decided whether all employees in the organization are involved in quality management programs. 29.3% of employees disagree that all employees in the organization are involved in quality management programs. 40.0% of employees strongly disagree that all employees in the organization are involved in quality management programs.

In summary, a significant portion (69.3%) of employees either disagrees or strongly disagree that all employees in the organization are involved in quality management programs. This indicates that there may be a need for improvement in the implementation or communication of quality management programs to ensure greater employee participation.

Table: 4.12. Did the project team conduct regular inspections and audits to verify that quality requirements were being met?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	19	6.3	6.3	6.3
	Agree	31	10.3	10.3	16.7
	Not decided	26	8.7	8.7	25.3
	Disagree	104	34.7	34.7	60.0
	Strongly Disagree	120	40.0	40.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the given data, it can be concluded that the project team did not conduct regular inspections and audits to verify that quality requirements were being met. 34.7% of the respondents dis agreed that regular inspections and audits were conducted. 40.0% of the respondents strongly dis agreed that regular inspections and audits were conducted. Therefore, a majority of the respondents (74.7%) disagreed or strongly disagreed with the statement, indicating that regular inspections and audits were not conducted.

Table: 4.13. Training received by employees equips them with understanding on quality management and their role in it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	2.7	2.7	2.7
	Agree	79	26.3	26.3	29.0
	Not decided	6	2.0	2.0	31.0
	Disagree	102	34.0	34.0	65.0
	Strongly Disagree.	105	35.0	35.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be concluded that: Only 2.7% of the employees strongly agree that the training received by them equips them with understanding on quality management and their role in it. 26.3% of the employees agree with this statement. 2% of the employees are undecided about whether the training received by them equips them with understanding on

quality management and their role in it. 34% of the employees disagree with this statement. 35% of the employees strongly disagree that the training received by them equips them with understanding on quality management and their role in it. Overall, the majority of the employees (69%) either disagrees or strongly disagree that the training they received adequately prepares them for quality management. This indicates a potential gap in the effectiveness of the training program.

Table: 4.14. All employees are aware of the relevance and importance of their activities and contribution to the quality objectives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	2.7	2.7	2.7
	Agree	70	23.3	23.3	26.0
	Not decided	18	6.0	6.0	32.0
	Disagree	81	27.0	27.0	59.0
	Strongly Disagree.	123	41.0	41.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, we can analyze the responses of employees regarding their awareness of the relevance and importance of their activities and contribution to the quality objectives. 8 employees (2.7%) strongly agree that they are aware of the relevance and importance of their activities and contribution to the quality objectives. 70 employees (23.3%) agree that they are aware of the relevance and importance of their activities and contribution to the quality objectives. Not decided: 6.0% have not yet decided on whether they are aware of the relevance and importance of their activities and contribution to the quality objectives. 81 employees (27.0%) disagree with the statement that they are aware of the relevance and importance of their activities and contribution to the quality objectives. 123 employees (41.0%) strongly disagree with the statement that they are aware of the relevance and importance of their activities and contribution to the quality objectives. Based on these responses, it is evident that a majority of employees (68.0%) either disagree or strongly disagree with the statement. Only a

minority of employees (25.7%) agrees or strongly agrees, while a small portion (6.0%) has not decided yet.

This data suggests that there may be a lack of awareness or understanding among employees regarding the relevance and importance of their activities and contribution to the quality objectives. Organizations should focus on improving communication and providing training or resources to enhance employee awareness and engagement in quality objectives.

Table: 4.15. The organization management ensures quality standards are being utilized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	12	4.0	4.1	4.1
	Agree	57	19.0	19.3	23.4
	Not decided	25	8.3	8.5	31.9
	Disagree	73	24.3	24.7	56.6
	Strongly Disagree.	128	42.7	43.4	100.0
	Total	295	98.3	100.0	
Missing	System	5	1.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the given data, the majority of respondents (42.7%) strongly disagree that the organization management ensures quality standards are being utilized. This is followed by 24.3% who disagree, 19.0% who agree, 8.3% who are undecided, and only 4.0% who strongly agree.

Overall, it appears that there is a significant portion of the respondents who do not believe that the organization management is effectively implementing quality standards. This indicates a potential issue with the organization's quality management system and suggests a need for improvement in this area.

Table: 4.16. The project's current level of quality is assessed regularly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	9	3.0	3.0	3.0
	Agree	57	19.0	19.1	22.1
	Not decided	37	12.3	12.4	34.6
	Disagree	77	25.7	25.8	60.4
	Strongly Disagree.	118	39.3	39.6	100.0
Total		300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be analyzed that the project's current level of quality is assessed regularly. Out of the 300 respondents, the majority of them (39.6%) strongly disagree with the statement that the project's current level of quality is assessed regularly. This suggests that there might be a lack of regular assessment of quality in the project. Additionally, 25.8% of respondents disagree with the statement, further indicating a dissatisfaction with the current level of quality assessment. On the other hand, 22.1% of respondents agree that the project's current level of quality is assessed regularly, while only 3.0% strongly agree. These figures suggest that there is a minority of individuals who feel satisfied with the regular assessment of quality in the project. There is a small portion of respondents (12.4%) who have not yet made up their mind about the statement, indicating a level of uncertainty or lack of awareness about the regularity of quality assessments. Overall, the data suggests that there is room for improvement in terms of regularly assessing the project's level of quality.

Table: 4.17. Were all quality assurance activities conducted in accordance with the established quality management plan?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	34	11.3	11.3	11.3
	Agree	61	20.3	20.3	31.7
	Not decided	13	4.3	4.3	36.0
	Disagree	69	23.0	23.0	59.0
	Strongly Disagree.	123	41.0	41.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be seen that the majority of individuals do not agree that all quality assurance activities were conducted in accordance with the established quality management plan. 41% strongly disagree, while an additional 23% disagree. This indicates that a significant portion of respondents do not believe that the established quality management plan was followed. On the other hand, 11.3% strongly agree and 20.3% agree that all quality assurance activities were conducted according to the plan. This indicates that there is still a minority who believe that the plan was followed. It is worth noting that 4.3% of respondents chose "not decided," indicating uncertainty or lack of information on the matter. Overall, the data suggests that there is a level of skepticism or disagreement regarding the conformance of quality assurance activities to the established quality management plan. This may necessitate further investigation or improvements to ensure adherence to the plan in the future.

Table: 4.18. The project team effectively track and report quality metrics to monitor the project's progress against quality objectives?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	3	1.0	1.0	1.0
	Agree	80	26.7	27.0	28.0
	Not decided	25	8.3	8.4	36.5
	Disagree	81	27.0	27.4	63.9
	Strongly Disagree.	107	35.7	36.1	100.0
	Total	296	98.7	100.0	
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, 27.0% of respondents strongly agree that the project team effectively tracks and reports quality metrics to monitor the project's progress against quality objectives. Additionally, 26.7% of respondents agree with this statement. However, 35.7% of respondents strongly disagree with the effectiveness of the project team in tracking and reporting quality metrics. Furthermore, 27.0% of respondents disagree with this statement. Overall, the majority of respondents (63.9%) either disagrees or strongly disagrees with the project team's effectiveness in tracking and reporting quality metrics. Only 27.0% agree or strongly agree, and 8.3% have not decided on this matter.

It is clear that the project team's ability to track and report quality metrics is a concerning issue for a significant portion of the respondents.

Table: 4.19. The Quality Management Plan align with regulatory quality standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	11	3.7	3.7	3.7
	Agree	35	11.7	11.8	15.5
	Not decided	14	4.7	4.7	20.3
	Disagree	76	25.3	25.7	45.9
	Strongly Disagree.	160	53.3	54.1	100.0
	Total	296	98.7	100.0	
Missing	System	4	1.3		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the given data, the majority of respondents (53.3%) strongly disagree that the Quality Management Plan aligns with regulatory quality standards. This is followed by 25.3% who disagree, 11.7% who agree, 4.7% who have not decided, and only 3.7% who strongly agree. Overall, it is evident that there is a significant level of dissatisfaction with the alignment of the Quality Management Plan with regulatory quality standards among respondents.

Table: 4.20. Did the project team effectively monitor and control the quality of project deliverables throughout the project lifecycle?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	2.0	2.1	2.1
	Agree	45	15.0	15.7	17.8
	Not decided	8	2.7	2.8	20.6
	Disagree	74	24.7	25.9	46.5
	Strongly Disagree.	153	51.0	53.5	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, the analysis shows that the majority of respondents (51%) strongly disagree that the project team effectively monitored and controlled the quality of project

deliverables throughout the project lifecycle. Additionally, 24.7% of respondents disagreed with the statement. On the other hand, only 17.8% of respondents agreed or strongly agreed that the project team effectively monitored and controlled the quality of project deliverables. It is worth noting that a small percentage (2.7%) of respondents was undecided on this matter. Overall, based on the data, it can be concluded that the project team did not effectively monitor and control the quality of project deliverables throughout the project lifecycle.

Table: 4.21. Were all required quality control inspections and tests conducted to ensure the project's compliance with quality standards?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	9.0	9.0	9.0
	Agree	41	13.7	13.7	22.7
	Not decided	8	2.7	2.7	25.3
	Disagree	103	34.3	34.3	59.7
	Strongly Disagree.	121	40.3	40.3	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the given data, it can be observed that: - 9% of the respondents strongly agree that all required quality control inspections and tests were conducted to ensure compliance with quality standards. - 13.7% of the respondents agree with the statement. - 2.7% of the respondents are not decided or unsure about whether the inspections and tests were conducted. - 34.3% of the respondents disagree with the statement. - 40.3% of the respondents strongly disagree with the statement. In total, 22.7% of the respondents agree or strongly agree that the required inspections and tests were conducted, while 59.7% of the respondents disagree or strongly disagree.

This data suggests that there is a significant portion of respondents who do not believe that all the necessary quality control inspections and tests were conducted to ensure compliance with quality standards in the project. Further investigation may be needed to address any concerns or issues raised by these respondents.

Table: 4.22. The organization management ensure that purchased product confirm to specified requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	9.0	9.1	9.1
	Agree	39	13.0	13.1	22.2
	Not decided	12	4.0	4.0	26.3
	Disagree	122	40.7	41.1	67.3
	Strongly Disagree.	97	32.3	32.7	100.0
	Total	297	99.0	100.0	
Missing	System	3	1.0		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, we can analyze the responses to the statement "The organization management ensures that the purchased product conforms to specified requirements" as follows:

9.1% of the respondents strongly agree that the organization management ensures the purchased product meets the specified requirements. This indicates a high level of confidence in the organization's management. 13.1% of the respondents agree that the organization management ensures the purchased product conforms to the specified requirements. This adds to the overall positive perception of the organization's management, although to a slightly lesser extent than those who strongly agree. 4.0% of the respondents have not yet formed an opinion on whether the organization management ensures product compliance with specified requirements. This indicates a potential lack of information or uncertainty among these respondents. 41.1% of the respondents disagree with the statement, suggesting that they believe the organization's management does not ensure the purchased product meets the specified requirements. This is a significant portion of the respondents and may indicate a lack of trust or perceived shortcomings in the organization's management processes. 32.7% of the respondents strongly disagree with the statement, indicating a higher level of disbelief in the organization's management's ability to ensure product compliance with specified requirements.

Overall, around 22.2% of the respondents agree or strongly agree that the organization management ensures the purchased product conforms to specified requirements, while a majority of 67.3% disagree or strongly disagree. This suggests that there may be room for improvement in

the organization's management processes regarding product quality control and meeting specified requirements.

Table: 4.23. Did the project team document and communicate any identified quality issues or non-conformities to relevant stakeholders?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	18	6.0	6.0	6.0
	Agree	45	15.0	15.1	21.1
	Not decided	16	5.3	5.4	26.5
	Disagree	109	36.3	36.6	63.1
	Strongly Disagree.	110	36.7	36.9	100.0
	Total	298	99.3	100.0	
Missing	System	2	.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, it appears that the majority of respondents (36.7%) strongly disagree that the project team documented and communicated any identified quality issues or non-conformities to relevant stakeholders. Similarly, 36.3% of respondents disagree with this statement. On the other hand, 15% of respondents agreed that the project team did document and communicate any identified quality issues or non-conformities, while only 6% strongly agreed. A small portion of respondents (5.3%) did not have a decided opinion on this matter. Overall, it seems that a significant number of respondents believe that the project team did not effectively document and communicate quality issues or non-conformities to relevant stakeholders.

Table: 4.24. **Quality data is measured on a regular basis.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	7	2.3	2.3	2.3
	Agree	27	9.0	9.1	11.4
	Not decided	22	7.3	7.4	18.8
	Disagree	116	38.7	38.9	57.7
	Strongly Disagree.	126	42.0	42.3	100.0
	Total	298	99.3	100.0	
Missing	System	2	.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the given data, we can analyze the quality data measurement in the following way:

1. Frequency and Percent: The table shows the frequency and percentage of responses for each category. For example, 7 respondents (2.3%) strongly agree, 27 (9.0%) agree, 22 (7.3%) have not decided, 116 (38.7%) disagree, and 126 (42.0%) strongly disagree.

2. Valid and Cumulative Percent: The valid percent represents the percentage of valid responses for each category, excluding missing data. The cumulative percent represents the cumulative total of valid percentages. For example, 2.3% strongly agree, 9.1% agree, 7.4% not decided, 38.9% disagree, and 42.3% strongly disagree. The cumulative percent for strongly disagree represents 100% of the valid responses.

3. Missing Data: There are 2 missing data points, which account for 0.7% of the total responses.

Overall, the data shows a majority of respondents (38.7%) disagree with the statement that quality data is measured on a regular basis, followed by 42.0% strongly disagreeing. Only a small percentage (11.4%) agrees that quality data is measured regularly, while 2.3% strongly agree. A significant number (7.4%) of respondents have not decided on their opinion. The missing data points need further investigation, as they account for a small proportion (0.7%) of the total responses.

Table: 4.25. Customer quality standards are defined and documented.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	.7	.7	.7
	Agree	49	16.3	16.6	17.2
	Not decided	16	5.3	5.4	22.6
	Disagree	112	37.3	37.8	60.5
	Strongly Disagree.	117	39.0	39.5	100.0
	Total	296	98.7	100.0	
Missing	System	4	1.3		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, the majority of the customers surveyed (39.5%) strongly disagree that customer quality standards are defined and documented. Additionally, 37.8% disagree with this statement. On the other hand, a smaller percentage of customers agree (16.6%) or strongly agree (0.7%) that customer quality standards are defined and documented. It is worth noting that a significant portion of the customers (22.6%) have not yet decided or provided their opinion on this matter. Overall, the data suggests that there may be a lack of clarity and documentation regarding customer quality standards, as a large portion of the surveyed customers do not agree with the defined standards. Further analysis and investigation would be required to understand the reasons behind these perceptions and address any potential gaps in the quality standards.

Table: 4.26. Did the project team effectively close out any identified quality issues or non-conformities before project completion?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	4	1.3	1.3	1.3
	Agree	26	8.7	8.7	10.0
	Not decided	21	7.0	7.0	17.0
	Disagree	129	43.0	43.0	60.0
	Strongly Disagree.	120	40.0	40.0	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

Based on the given data, it appears that the majority of respondents (40%) strongly disagree that the project team effectively closed out any identified quality issues or non-conformities before project completion. Additionally, 43% of respondents disagree with this statement. a small percentage (1.3%) strongly agree that the project team effectively closed out any identified quality issues or non-conformities before project completion, and 8.7% agree with this statement. There are 7% of respondents who have not decided whether the project team effectively closed out any identified quality issues or non-conformities before project completion.

Table: 4.27. Were the project's final deliverables reviewed and approved by relevant stakeholders to ensure their quality and fitness for purpose?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	2.7	2.7	2.7
	Agree	57	19.0	19.0	21.7
	Not decided	9	3.0	3.0	24.7
	Disagree	105	35.0	35.0	59.7
	Strongly Disagree.	121	40.3	40.3	100.0
	Total	300	100.0	100.0	

Source: own calculation of sample survey result (2023)

As shown on the table a significant portion of the respondents (75.3%) either disagree or strongly disagree that the project's final deliverables were reviewed and approved by relevant

stakeholders to ensure their quality and fitness for purpose. This suggests that there may be concerns regarding the effectiveness of stakeholder involvement and quality assurance processes in the project.

Table: 4.28. Did the project team conduct a final assessment to evaluate the overall success of the project's quality management efforts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	8	2.7	2.7	2.7
	Agree	51	17.0	17.3	20.0
	Not decided	18	6.0	6.1	26.1
	Disagree	107	35.7	36.3	62.4
	Strongly Disagree.	111	37.0	37.6	100.0
	Total	295	98.3	100.0	
Missing	System	5	1.7		
Total		300	100.0		

Source: own calculation of sample survey result (2023)

Based on the data provided, it can be seen that the majority of respondents (62.4%) disagreed with the statement that the project team conducted a final assessment to evaluate the overall success of the project's quality management efforts. A significant percentage (37.6%) strongly disagreed with this statement. On the other hand, a smaller percentage of respondents (20.0%) agreed that a final assessment was conducted. A very small percentage (2.7%) strongly agreed with this statement. There were also 18 respondents (6.1%) who were not decided on whether a final assessment was conducted or not. Overall, the results suggest that there may have been a lack of proper evaluation of the project's quality management efforts in terms of a final assessment.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Summary of major findings

The findings of the study show Oromia Engineering corporation (ECO) has a system to implement project quality management. The results show that the management of the Oromia Engineering corporation (ECO) is committed towards implementation of projects quality management. But it is revealed that the management is more committed to project quality planning processes than the assurance and control. When I tried to see different literatures according to Mahlet Mulugetas paper that done on project quality management in, April,2022 The quality of project is defined by three parameters: quality of materials used, quality of work and the quality of workmanship. The parameter includes the use of material according to specification, quality working mechanics and quality manpower. But in study project quality management was assessed by three major themes, these are, plan quality, quality assurance and quality control. Quality management enables companies to continuously improve its products, processes, and systems. Quality management is one of the important means of improving the quality of survey project. It emphasizes continuous improvement in the quality of the project and organizational objectives. To ensure the continually improvement of Quality Management System, it is essential that the top management to give their full support and commitment especially to the development and implementation of survey Project. As it can be seen from the analysis there is a better communication of project quality information within project team than between sections and with customers. Finally, it was found out that employees are trained but their involvement in project quality programs was not evident.

5.2 Conclusion

From the findings obtained from data analysis it can be concluded that the top management of the case of Oromia Engineering corporation (ECO) is committed towards implementation of project quality management. It can be seen from the findings that the top management is committed in the project quality planning process to higher degree than the project quality assurance and project quality control.

The findings also indicate that there is free flow of project quality information within project teams. However, there is minimal flow of information between sections of the organization and between the organization and customers.

Finally, it can be inferred from the findings that training is provided to employees to equip them with the necessary competencies. But employee's participation in project quality programs and awareness on their contribution to project quality is low. This can also be inferred from the higher percentage of respondents rating of neutral to questions raised to address issues of project quality management implementation in the organization.

5.3 Recommendation

It is evident that top management commitment is critical in implementation of project quality management. This study therefore recommends that organizations which are implementing project quality management give equal emphasis to participation of top management to project quality planning, project quality assurance and quality control. The effectiveness of project quality implementation depends on the effectiveness of the three processes. Majorly top management needs to assure that projects being released are as per standards, ensure regular quality audit is taking place, manage non-conformities on time and avail resources needed for checking quality of projects at each stage.

Top management needs to ensure that employees at all levels of the organization are aware of project quality management and their contribution to it. Unless they know the value of their activity, they cannot feel sense of ownership and act per company procedure. In addition, employees are much motivated by using reward and recognition of employees who participated in a project which is completed with the desired quality and accepted well by customers.

The researcher also recommends that top management develop communication systems that allow free flow of quality information at all levels in the organization and between the organization and customers. The flow information between sections can be better improved by preparing experience sharing events and announcing major accomplishments. The flow of information with customers can be improved by assigning of specific employee responsible for communicating with customers and creating awareness to customers on quality and the value of on time communication.

Further studies may be done to explore the relationship between project quality management implementation and organizational performance.

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APPENDIX A

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTEMENT OF PROJECT MANAGEMENT

Title of the Thesis "Assessment of Project Quality management Practices: The Case of The case of oromia Engineering corporation."

Dear respondent,

The purpose of this questionnaire was to collect data for requirement for partial fulfillment of M.A degree in **project management** in St, Merry University to undertake research on entitled **"Assessment of Project Quality management Practices: The Case of The case of oromia Engineering corporation."** and collect the required data. Your genuine response for the following question is extremely important for the successful completion of this paper. The information provides used for purpose indicated and will be kept highly confident. I would like to thank you in advance for your cooperation and scarification of your time.

Key:

- Put a tick mark (√) on the space provided
- Do not write your name.

Part I: Background data

1. Gender

Female ☐

Male ☐

2. Position Held

Top management ☐

Technical staff ☐

Support staff ☐

3. Department

a) Finance and administration ☐

b) Projects ☐

c) Marketing ☐

d) Quality assurance ☐

Part 2: Statements related with the implementation of Project Quality Management

Rating

The following statements are issues related to implementation of project quality management. Using the key (Where: **1=strongly agree, 2 = agree, 3 = Neutral, 4 = disagree, 5 = strongly disagree**)

Please tick appropriately according to the extent which you agree or disagree with the statements.

S.no	Item	1	2	3	4	5
	Quality Planning					
1	The project team develops a comprehensive plan for managing quality throughout the project lifecycle?					
2	The quality objectives clearly defined and aligned with the overall project objectives in the quality management plan?					
3	The project team establishes appropriate quality metrics and measurement criteria to evaluate the project's performance against the quality objectives?					
4	The Quality Management Plan align with regulatory quality standards.					
5	Customer quality standards are defined and documented.					
6	Quality polices and standards are agreed upon by decision makers.					
7	Quality Management Plan is created and communicated to the project team.					

	Quality Assurance					
8	The project team conducts regular reviews and assessments to evaluate the effectiveness of quality assurance activities					
9	The quality management plan communicated effectively to all project stakeholders.					
10	There is free flow of quality management information between different sections of your organization					
11	The project team effectively identifies and document all relevant quality requirements and standards.					
12	All employees in your organization are involved in quality management programs.					
13	Training received by employees equips them with understanding on quality management and their role in it.					
14	All employees are aware of the relevance and importance of their activities and contribution to the quality objectives.					
	Quality Control					
15	All quality assurance activities conducted in accordance with the established quality management plan.					
16	The project team conducts regular inspections and audits to verify that quality requirements were being met.					
17	The organization management ensures quality standards are being utilized.					
18	The project's current level of quality is assessed regularly.					
19	The project team effectively track and report quality metrics to monitor the project's progress against quality					

	objectives?					
20	The project team effectively monitors and controls the quality of project deliverables throughout the project lifecycle?					
21	All required quality control inspections and tests conducted to ensure the project's compliance with quality standards?					
22	The organization management ensure that purchased product confirm to specified requirements.					
23	The project team document and communicate any identified quality issues or non-conformities to relevant stakeholders?					
24	Quality data is measured on a regular basis.					
25	The project team effectively closes out any identified quality issues or non-conformities before project completion.					
26	The project's final deliverables reviewed and approved by relevant stakeholders to ensure their quality and fitness for purpose.					
27	The project team conducts a final assessment to evaluate the overall success of the project's quality management efforts.					
28	The project team's quality management efforts adequately documented and lessons learned captured for future projects					

Key Informant Interview questions

1. Would you tell me your current position in your organization, level and type of your

Education and experience on project quality management?

2. What is your general experience in your organization in project implementation and management with reference to time, budget and quality of a project?

3. Do you have project quality management system in your organization?

4. What are the policy and procedure concerning quality?

5. How do you ensure that project quality is planned and defined at the beginning of the project?

6. How do you assess and address potential risks and issues related to project quality?

7. How do you determine the appropriate quality standards and metrics to be used in a project?

8. Do you have training on project management? especially on project quality management?

9. How do you see management commitment and priority for project quality implementation and management?

10. How are projects quality maintained? What are the measures you take to control quality

of projects?