



**AN ASSESSMENT ON PROJECT QUALITY MANAGEMENT
PRACTICE: THE CASE OF ETHIOPIAN
ROAD AUTHORITY**

BY

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OF ETHIOPIAN ROAD AUTHORITY***

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DECLARATION

I hereby declare that the study which is being presented in this thesis entitled “*An Assessment On Project Quality Management Practice: The Case Of Ethiopian Road Authority*” is original work of my own. It had not been presented for a partial fulfillment for any educational qualification at this university or any other and in any projects by any means, and the resources materials used for this thesis had been accordingly acknowledged

Hrit Zemichael

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ENDORSEMENT

This is to certify that this Thesis paper work, entitled “*An Assessment On Project Quality Management Practice: The Case Of Ethiopian Road Authority.*”, which is undertaken by Hrit Zemichael for the partial fulfillment for the requirements of the degree of Masters of Art in Project Management at Addis Ababa University school of commerce, to best of my knowledge is an original work and not submitted earlier for any degree either at this University or any other University in any means.

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ABSTRACT

Quality is one of the most prioritized parameter to consider while undertaking any construction projects in parallel quality in infrastructures is a significant factor to consider, accordingly this study will assess the quality management practice in ERA road project in order to assess this parameter top management involvement, communication and challenges faced while practicing quality management in the projects were considered. To achieve these objectives data were collected using quantitative methods from sample size of 51 with response rate 80% of personnel's and experts who are concerned with quality management in the projects and analyzed using descriptive statistics focusing on the mean, standard deviation and percentages, which is calculated using statistical package for the social sciences (SPSS) version 20. The validity and internal consistency of the instrument were checked and measured using Cronbach Alpha were the result was greater than 70%, which can signifies that reliability of data was good. The finding revile that top management involvement and communication of quality information to be good in the projects, even though there are quality management policy and strategy, adequate training in quality management for employees and willingness of project staff to accept quality management system in the projects these projects face inefficient resource management, inadequate technical skill and regular supervision in the projects, Therefore it is recommended to have sufficient and adequate technical skill, resource management and supervision in the projects.

Key words: Project, Practice, Quality, Quality management

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LIST OF ACRONYMS

ERA	Ethiopian road authority
EVS	Estimate validation system
ISO	International Organization for Standardization
RSDP	Road sector development program
TOR	Term of reference
QMS	Quality management system
QC	Quality control
PMI	Project Management Institute
TQM	Total quality management
WMS	Works monitoring system

CHAPTER ONE: INTRODUCTION

The concept of quality management is to ensure efforts to achieve the required level of quality for the product which are well planned and organized. From the perspective of a construction company, quality management in construction projects should mean maintaining the quality of construction works at the required standard so as to obtain customers' satisfaction that would bring long term competitiveness and business survival for the companies (Tan & Abdul-Rahman, 2005).

Harris and McCaffer (2001) explained that quality management has to provide the environment within which related tools, techniques and procedures can be deployed effectively leading to operational success for a company.

Project Quality Management is the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives. It also supports continuous process improvement activities as undertaken on behalf of the performing organization. (PMI, 2017)

The construction industry gives high priority towards poor quality, as lack of quality could be detrimental to both the contractors and the clients. In this industry, quality is determined by the client by a series of documents before the commencement of a project. The details of these documents depict the client's requirements for the project at hand, and the contractor must fulfil those requirements to achieve quality in that project (Rajendran, et al., 2012).

Quality management is, therefore, a major focus for construction project managers as the whole project must be undertaken towards meeting the customer's requirements.

1.1 BACKGROUND OF THE STUDY

PMI Guide (2017) defines Project Quality Management as the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

Implementation of quality management in project embraces the concepts of quality planning, quality assurance and quality control. Quality management processes were defined by Project Management Institute and several tools and techniques were identified as part of the implementation process which includes: - benefit/cost analysis, benchmarking, flow-charting, design of experiments, cost of quality, quality audits, inspection, control charts, pareto diagrams, statistical sampling, flow-charting and trend analysis (ibid).

According to (ISO 8402, 1994) QMS is described as a system as the organizational structure, process, resources and procedure needed to implement quality management and that it involves the activities of the overall management function that determines the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement. For ensuring effectiveness, flexibility and competitiveness in their construction activities the real estate residential builders need to adopt QMS in their system of a business as a whole.

Project Quality Management addresses the management of the project and the product of the project. In every case, failure to meet product or project quality requirements can have serious negative consequences for any or all the project stakeholders. It is not about finding and fixing errors after the fact, rather quality management is the continuous monitoring and application of quality processes in all aspects of the project. Even projects that are delivered within budget and on time are not successful if the quality of the deliverable is poor (ibid).

Hoonakker et al. defined quality in the construction industry as the capability to meet customer expectations, capability for projects to stay within budget and within schedule, reduced defects and reworks, and projects' conformance to the ISO 9000 standards of quality.

However, the construction industry has been characterized with issues of productivity and poor performance, as clients are demanding projects to be completed on schedule and within budget (Hoonakker, et al., 2010)

1.2 BACKGROUND OF THE ORGANIZATION

ERA was reestablished by proclamation No.63/1993 with a view to providing a strong administration under the leadership of a Board. As part of its reform, the government assigned administration of rural roads to the regional self-governments and main roads to ERA as part of the Federal Government's responsibility.

ERA's role regarding rural roads was then limited to rendering support such as overall network planning, training and technical assistance as required by Regional Governments.

The main objectives of ERA, as stated in the aforementioned regulation, are to develop and administer roads, create conducive conditions for the coordinated development of roads network, and ensure the maintenance of standards in road construction.

The Government of Ethiopia allocates a significant part of the Budget towards the roads programme, and external financiers also assist ERA with important credit and grant facilities

Accordingly ERA has developed quality manual with the goal to take ERA towards the requirements of ISO 9001 Quality Management Systems and ISO 14001 Environmental Management Systems and also to increasing efficiency and reduce wastage in the planning, design, and implementation of the ERA roads programs.

The Quality manual mainly constitutes the following set of Quality Manual in harmony with the other set of systems and the New Standard Term of Reference for Service Providers (TOR's) that are listed hereunder or other appropriate set of systems that are designed for ensuring quality are required to be used for the road asset delivery and management work as appropriate.

- Volume 1, Quality Management and Monitoring
- Volume 2, Planning
- Volume 3, Procurement
- Volume 4, Feasibility Studies and Design
- Volume 5, Environmental and Social Management
- Volume 6, Construction Management
- Volume 7, Maintenance Management

In addition to the Quality Manual, ERA has a full set of systems aimed at ensuring quality, including:

- Design Manuals
- Technical Specification and Method of Measurement
- Standard Detailed Drawings
- Low Volume Roads Manual, Specifications and Bidding Documents
- Pavement Management System (PMS)
- Bridge Management System (BMS)
- Estimate Validation System (EVS)
- Tender Analysis System (TAS)
- Works Monitoring System (WMS)
- Performance Appraisal System (PAS)

New Standard Term of Reference for Service Providers:

- TOR1. Feasibility Study and Design, New Road construction
- TOR2. Feasibility Study and Design, Road Upgrading and Rehabilitation
- TOR3. Review of Feasibility Study and Design
- TOR4. Construction Supervision (including preliminary design review)

The Standard Term of Reference set out a road map that clearly defines what needs to be achieved, by whom and when. The use of the standard TOR's ensures sustainable use of the Quality Manuals.

The adoption of Quality Manual will be enforced through audits. Tools like WMS and EVS will supplement the auditing and inspection aspect and also provide information to be analyzed so that there is future improvement.

There will also be performance monitoring and evaluation of Consultants and Contractors, and ERA contract management.

In the context of Ethiopia's geography, pattern of settlement and economic activity, transport plays a vital role in facilitating economic development. In particular, it is road transport that provides the means for the movement of people, utilization of land and natural resources, improved agricultural production and marketing, access to social services, and opportunities for sustainable growth. Recognizing the importance of the road transport in supporting social and economic growth and its role as a catalyst to

meet poverty reduction targets, the government of Ethiopia has placed increased emphasis on improvement of the quality and size of road infrastructure in the country.

To address constraints in the road sector, mainly low road coverage and poor condition of the road network the Government formulated the Road Sector Development Program (RSDP) in 1997. The RSDP has been implemented over a period of fifteen years and in four separate phases over fifteen years of RSDP physical works consisting of rehabilitation and upgrading of trunk and link roads, construction of new link main access roads, construction of rural roads and community roads and maintenance of federal and regional road has been carried out by ERA, RRAs, wereda road desks, the community and municipalities.

Also over fifteen years of RSDP series of policy and institutional reforms have been implemented and the impact of the program in building the capacity of the domestic construction industry is encouraging specifically, participation of the local contracting industry has increased, in terms of both the value and number of projects, over the last fifteen years of the RSDP. Some Local contractors are now taking relatively bigger contracts. International contractors are attracted to Ethiopia for its political stability, consistent growth, and relatively good legal system as compared to many other African states the majority of the International contractors are Chinese companies they work

mostly on infrastructure construction; a significant proportion engages specifically in road construction.

In many respects these Road Projects are successful, however observations show that there is a difference in the rate of work completion, level of construction quality and cost at completion between Local and International contractors.

If left unaddressed, this challenge will endanger the long-term success of the Authority to be a safe, effective, efficient and fully integrated Road Authority which will best meet the needs of all at improving levels of service, levels of Local contractors and reducing costs of living for economic and social development, whilst being environmentally and economically sustainable (ERA, 2013).

1.3 STATEMENT OF THE PROBLEM

Quality management practices have fallen short of expectations in the construction industry. Love and Li (2000) affirm that the lack of attention to quality assurances within the construction industry has resulted in quality failures becoming endemic features of the industry.

Poor quality management is profound in developing countries. For example Joubert, Cruywagen and Basson (2005) found that a disregard of quality management implementation exists within the South African construction industry. Some of the factors affecting the practice of quality management highlighted by Said et al. (2009) include lack of commitments to quality, inadequate support from management, poor attention to quality issues and poor planning for quality.

As described in a research by Fetene Nega, building projects that are delivered within estimated cost, specified quality and calculated time can greatly satisfy client, contractor and consultant and the project can be said it is delivered in successful manner. But as indicated by the research most of building projects in the country are not delivered successfully to the client” (Fetene Nega, 2008).

Other research by Solomon Desta on Ethiopian Road Authority shows that the Authority’s both Internal Audit Service Directorate and Quality Assurance, Road Inspection and Safety Management Directorate is ill-staffed and not performing the detailed audits and quality assurances. And it also expressed Authority’s current approach of project performance evaluation lacks a proper check-and-balance. Currently, the performance evaluation is conducted by the parties responsible for the execution of the various processes, projects and programs (Solomon, 2015).

There is no doubt that there is a current and indeed pressing need to examine the implementation of quality management in many construction industries quality therefore, must be recognized from the point of importance, at the same level as the scope of the project, time and costs. If the stakeholders are not satisfied with the quality of project management or the results of the project, the project team should commit scope change, time extensions and additional costs to satisfy the stakeholders’ needs and expectations.

1.4 RESEARCH QUESTIONS

1.4.1 General Research Question

- How does Ethiopian road authority practice quality management

1.4.2 Specific Research Questions

- How is the top management responsible to practice quality management in Ethiopian road authority road projects?
- Does the project team practice proper communication of project quality information in Ethiopian road authority road projects?
- What are the challenges faced to practice quality management in Ethiopian road authority road projects?

1.5 RESEARCH OBJECTIVE

1.5.1 General Objective

- To describe the practice of quality management in Ethiopian road authority.

1.5.2 Specific objective

- To determine the top management responsibility towards quality management in Ethiopian road authority.
- To determine if there is proper communication of project quality information by the project team in Ethiopian road authority road projects
- To determine the challenges faced in managing quality by Ethiopian road authority.

1.6 SIGNIFICANCE OF THE STUDY

For a project to be deemed success quality is one of the key success indicator that ought to be attained, In the previous studies which were undertaken in Ethiopia quality has been an issue in the construction industry. Therefore, this study will be resourceful for all stakeholders concerned with project success.

The findings of the study will also provide a lessons learned document Ethiopian road authority road projects and a good base for further evaluation and improvement of any area of the quality management process.

1.7 SCOPE OF THE STUDY

The study assesses only the quality management practice of projects undertaken by Ethiopian road authority ongoing road project under central region. It doesn't assess any other project management issues. Projects undertaken by other sectors of the corporation are not included in the study.

1.8 LIMITATIONS OF THE STUDY

Because the methodology for this research is descriptive the study determines only practices not cause and effects. And also because of the covid-19 pandemic data collection were difficult.

1.9 ORGANIZATION OF THE STUDY

The research paper contains five chapters. Chapter one contain background of the study, statement of the problem, research questions, objectives of the study, scope of the study, and limitations of the study. Chapter two is dedicated to review related theoretical and empirical literatures and provide conceptual framework of the study. Chapter three deals with the research design and methodology, sources of data, target population, sampling technique, and tools of data collection and analysis. Chapter four presents results and discussions of results. Chapter five gives conclusion and recommendations based on the findings.

1.10 DEFINITION OF KEY TERMS

QUALITY is the capability to meet customer expectations, capability for projects to stay within budget and within schedule, reduced defects and reworks, and projects' conformance to the ISO 9000 standards of quality.

QUALITY MANAGEMENT is to ensure efforts to achieve the required level of quality for the product which are well planned and organized.

PROJECT QUALITY MANAGEMENT is the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken it uses policies and procedures to implement within the project's context and supports continuous process improvement activities as undertaken on behalf of the performing organization

CHAPTER TWO: REVIEW OF RELATED LITERATURE

This chapter presents a literature review for the research. Relevant literature on quality management are discussed, the concepts of quality and quality management are explored and ERA quality manual is reviewed.

2.1. THEORETICAL LITERATURE REVIEW

2.1.1. QUALITY

The definition of quality has shifted from mere conformance to customer expectations to a phenomenon where a product or service can be rendered at low cost while maintaining its dependability and uniformity (Gitlow, et al., 2005).

Hoonakker et al (2010) defined quality in the construction industry as the capability to meet customer expectations, capability for projects to stay within budget and within schedule, reduced defects and reworks, and projects' conformance to the ISO 9000 standards of quality.

The ISO 9000 definition of *quality* is the totality of feature and characteristics of a product or service that bears on its ability to satisfy stated or implied needs.

Recently the demands of customer are being handled using total quality management (TQM). Total quality management is an ever-improving system for integrating various organizational elements into the design, development, and manufacturing efforts, providing cost-effective products or services that are fully acceptable to the ultimate customer.

Externally, TQM is customer oriented and provides for more meaningful customer satisfaction. Internally, TQM reduces production line bottlenecks and operating costs, thus enhancing product quality while improving organizational morale (Kerzner, 2017), hence customers are now demanding: higher performance requirements; faster product development; higher technology levels; materials and processes pushed to the limit; lower contractor profit margins; and fewer defects/rejects.

2.1.2. QUALITY MANAGEMENT

Kaoru Ishikawa stated that “In management, the first concern of the company is the happiness of the people who are connected with it. If the people do not feel happy and cannot be made happy, that company does not deserve to exist...” (Gitlow, et al., 2005). This statement is a unique take on the concept of quality as it emphasizes on the stakeholders in the organization. The people who are connected with the organization are the stakeholders, and they include the employees, customers, contractors, suppliers, and the community (Gitlow, et al., 2005). The stakeholders mentioned in the statement above are the employees as they are considered to be the most critical to how quality can be attained in an organization.

Thus, to effectively manage and pursue optimum quality in an organization, the most critical stakeholders in that organization (the employees) need to be kept happy as they are essential to the progress of that organization. According to Dale, et al., (2007), quality has evolved in the last two decades from basic inspection activities to major controlled processes. Quality control and quality assurance are part of the revolutionised modern quality management practices. Hoyle, (2007) explained what he termed ‘the four pillars’ of quality management; quality planning, quality control, quality improvement, and quality assurance.

Project quality management is a unique entity that cannot be overlooked in the execution of a project, it has to do with managing projects of all sorts and how to achieve the deliverables attributed to them (PMI, 2017). It is the process of planning, managing, and controlling quality in a project. This simply implies that project quality management is imperative to execute any construction project.

To successfully implement efficient quality management practices, there is a need to identify the existing level of quality in the organization, this is paramount before any plan can be devised and implemented. Burke, (2013) emphasized the importance of quality management in achieving project objectives; he stated that companies must tailor their quality management systems to meet the project deliverables on schedule. There are several ways of managing quality in construction projects. Some quality management practices have been in vogue for hundreds of years; however, there is a need to address the current predicament of the industry by employing certain practices.

Kerzner, (2017) explained how the need to improve quality is driven by customers' demands, the need to deliver projects on schedule, lower rates of defects in projects, and lower contractor profit margins are some of the basic customer demands. He explained the evolution of quality over the past number of years from being the responsibility of certain employees in an organization to being everyone's responsibility. In the modern day, organizations are starting to make quality the responsibility of every employee to ensure quality is embedded into their organizational culture.

The customer-focused orientation of quality is typified by a quality management practice called total quality management (TQM). Ishanka and Gooneratne (2018) defined TQM as the implementation of certain measures in a project to cut out costs that are not adding value to the project, and in the process increasing productivity. Catalin, et al., (2014) also defined TQM as a phenomenon whereby organizations seek continuous improvement by altering their organizational structure to suit customers' expectations. This approach towards quality management has been in place for decades, several organizations have tried to implement it due to its long-term effects on quality improvement.

In Kaufmann and Wiltschko, (2006), Quality Management Concept is said to be structured in general according to the "International Organization for Standardization" ISO 9000-series and the "Plan, Do, Check, Act" PDCA-cycle. It further illustrated the two main structures stated above as follows;

2.1.2.1. ISO 9001 STANDARDS

ISO which in full stands for International Standards Organization is a worldwide federation of worldwide standards bodies (Tarí, et al., 2012). Standards bodies from over 160 countries are comprised in this non-governmental organization where they develop and promote the international standards for technology, scientific testing processes, working conditions, societal issues and more (Tarí, et al., 2012). The Iso 9001 is a standard as developed by ISO that defines the requirements for a quality management system. It is a standard that applies to any industry and is used by organizations to demonstrate the ability to provide products and services that consistently meet customer and regulatory requirements (Heras-Saizarbitoria & Boiral, 2013).

ISO 9001 standards are necessary in the construction industry for reasons that include the following; to standardize services and product quality, to reduce costs for the builder and to ensure continual improvement. The ISO 9001 can support these benefits through particular standards that specifically apply to the construction sector. The elements include; Planning – the element of planning in the ISO 9001 is structured such that it encourages more specific strategic planning on complex building projects. It provides an enhanced focus of how risks and opportunities can be balanced so that the pre-identified objectives can be met in the construction projects (Heras-Saizarbitoria & Boiral, 2013). It can help to do that through performance-management of the contractors and through ensuring that the supply chain meets the price requirements and the quality objectives concurrently. Doing so can bring about financial, quality and time benefits to a construction company. Performance evaluation – this element is important since it would direct a construction company to analyze its performance over time while at the same time allowing attaining continual improvement through the already mentioned elements of improved planning as well as improved processes and performance (Heras-Saizarbitoria & Boiral, 2013).

The process approach – this is an element that would enable a construction company to be able to pull together all the factors of a complicated project such as budget and time. The process approach would be useful in helping a construction company to stay within the limits of such factors. Leadership – this element would be useful as it provides clear guidance on how to achieve excellent communication on the objectives and shared goals and also how to establish a great culture within construction projects which as a result would lead to the meeting of both financial and time targets which are crucial in the construction industry. The seven main principles of the ISO 9001 are customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making, and relationship management

2.1.2.2. PDCA-cycle

An important mindset of quality management is the PDCA-cycle. This cycle including the four components as Plan, Do, Check and Act (PDCA), was originally conceived by Walter Shewhart in the 1930`s, and later adopted by W. Edward Deming. The model provides in general a framework for the improvement of a process or system and is an iterative four-step quality strategy (Kaufmann and Wiltschko, 2006).

Plan: The first step in the PDCA cycle is to plan. Managers must evaluate the current process and make plans based on any problems they find. They need to document all current procedures, collect data, and identify problems. This information should then be studied and used to develop a plan for improvement as well as specific measures to evaluate performance.

Do: The next step in the cycle is implementing the plan (do). During the implementation process managers should document all changes made and collect data for evaluation.

Check: The third step is to check the data collected in the previous phase. The data are evaluated to see whether the plan is achieving the goals established in the plan phase

Act: The last phase of the cycle is to act on the basis of the results of the first three phases. The best way to accomplish this is to communicate the results to other members in the company and then implement the new procedure if it has been successful. Note that this is a cycle; the next step is to plan again. After we have acted, we need to continue evaluating the process, planning, and repeating the cycle again.

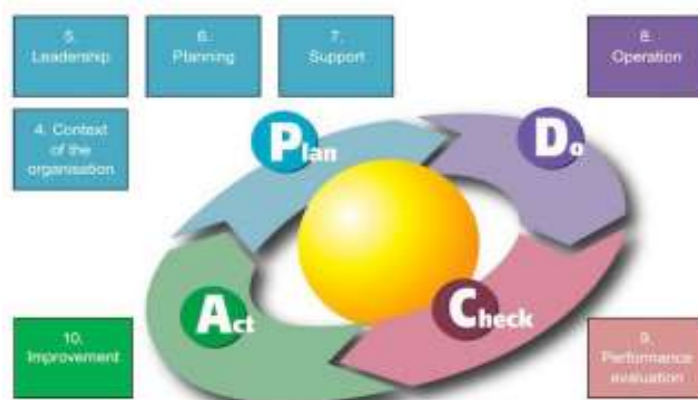


Fig 2.1. The PDCA cycle (source: Quality Management Systems, 2013)

2.1.3. QUALITY MANAGEMENT SYSTEMS

If implemented according to specification, formal quality management systems provide a vehicle for achieving quality (i.e. conformance to established requirements). As defined by ANSI, a quality system is “the organizational structure, responsibilities, procedures, processes, and resources for implementing quality management” (Battikha, 2002). In other words, Quality management systems refers to the set of quality activities involved in producing a product, process, or service, and encompasses prevention and appraisal (Burati et al., 1992). Quality activities include the determination of the quality policy, objectives, and responsibilities and implementing them through quality planning, quality control, quality assurance, and quality improvement, within the quality system (Battikha, 2002).

In the context of achieving ISO compatibility, modern quality management systems seek to minimize variation and to deliver results that meet defined requirements. These approaches recognize the importance of:

Customer satisfaction. Understanding, evaluating, defining, and managing requirements so that customer expectations are met. This requires a combination of conformance to requirements and fitness for use.

Prevention over inspection. Quality should be planned, designed, and built into—not inspected into the project’s management or the project’s deliverables. The cost of preventing mistakes is generally much less than the cost of correcting mistakes when they are found by inspection or during usage.

Continuous improvement. as defined by Shewhart and modified by Deming, the PDCA (plan-do-check-act) cycle is the basis for quality improvement. In addition, quality improvement initiatives such as Total Quality Management (TQM), Six Sigma, and Lean Six Sigma could improve the quality of the project’s management as well as the quality of the project’s product.

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). Cost of quality refers to the total cost of the conformance work and the nonconformance work that should be done as a compensatory effort because,

on the first attempt to perform that work, the potential exists that some portion of the required work effort may be done or has been done incorrectly.

2.1.4. PROJECT QUALITY MANAGEMENT

According to Crawford the overall aim of quality management is to satisfy the customer, conform to requirements, ensure fitness for purpose, and to ensure the product for use. Project model looks at quality management as set of activities or tasks that are required to ensure the project satisfies all the needs for which it was undertaken based on documented in the state of work and includes a focus on quality management from the perspective of product, processes, and the people needed to make quality an effective and efficient aspect of successful project completion (Crawford, 2002).

A sound quality management programs with processes in place that monitor the work in a project is a good investment it does not only contributes to customer satisfaction but also helps organizations use their resources more effectively and efficiently by reducing waste and rework hence, quality management is one area that should not be compromised. The payoff is a higher probability of successfully completing the project and satisfying the customer. (Winsock, 2014).

Hence, Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken it uses policies and procedures to implement within the project's context and supports continuous process improvement activities as undertaken on behalf of the performing organization. Project Quality Management works to ensure that the project requirements, including product requirements, are met and validated.

2.1.5. QUALITY MANAGEMENT PROCESS

Hoyle classified quality management into four major aspects what he termed 'the four pillars' of quality management; quality planning, quality control, quality assurance and quality improvement (Hoyle 2007). These four pillars of quality management form the basis on which quality can be managed throughout the duration of a construction project.

2.1.5.1. QUALITY PLANNING

Harris and McCaffer, (2001) defined quality planning as a set of activities whose purpose is to define quality system policies, objectives, and requirements, and to explain how these policies will be applied, how these objectives will be achieved, and how these requirements will be met. The PMI (2017) also addressed quality planning from a different position to enhance the thoughts earlier expressed. It said that quality planning has a process input generated by predecessor processes referred to as the Project Scope Statement and Project Management Plan these processes are introduced by external units like Enterprise Environmental Factors and Organizational Process Assets it further defined quality planning as the process for "identifying which quality standards are relevant to a project and determining how to satisfy them":

In other words, it means planning how to fulfill process and product (deliverable) quality requirements: "Quality is the degree to which a set of inherent characteristics fulfill requirements". By planning the quality one has to respect some principles, and these are:

Customer satisfaction comes first: Quality is defined according to the requirements of the customer.

Prevention over inspection: It's better to prevent mistakes than to find the result and repair the defects.

Management responsibility: Costs of quality must be approved by the management.

Continuous improvement: Becoming better is an iteratively structured process.

2.1.5.2. QUALITY ASSURANCE

In recent years, increasing concern has been expressed at the standards of performance and quality achieved in building works. The need for structured and formal systems of construction management to address the aspect of performance, workmanship and quality has arisen as a direct result of deficiencies and problems in design, construction, materials and components. Many of the problems experienced in building appear as a range of inadequacies from minor technical and aesthetic aspects to major building defects. Irrespective of their degree of severity, such problems are known to cost the industry so much annually, yet, many difficulties might be alleviated through greater

care and attention to standards of performance and quality at the briefing, design and construction stages of the building process (Griffith, 1990). If buildings are to be trouble-free, more attention needs to be given to applying quality assurance principles to design and site-work, including project selection and specification, and to supervision of the handling and protection on site (Atkinson, 2005).

Harris and McCaffer, (2001) defined quality assurance as a set of activities whose purpose is to demonstrate that an entity meets all quality requirements. Quality Assurance activities are carried out in order to inspire the confidence of both customers and managers, confidence that all quality requirements are being met.

According to Euro Roads, (2006), the main objective of quality assurance measures in information processes is to fulfill a required quality level. By using described probabilistic model, cause and effect diagram, one is able to analyse existing processes and to detect existing quality gaps within these processes.

Reference to Hendrickson (1999) cited in Khan et al, (2008), quality requirements should be clear and verifiable so that all parties in the project can understand them for conformance. Harris and McCaffer, (2001) continued that Quality assurance (QA) emphasizes defect prevention, unlike quality control that focuses on defect detection once the item is produced or constructed. It was further established that quality assurance concentrates on the production or construction management methods and procedural approaches to ensure that quality is built into the production system.

IMPORTANCE OF QUALITY ASSURANCE IN CONSTRUCTION

The importance of Quality Assurance is based on the principles of getting things right first time by implementing, maintaining, reviewing and continually improving a Quality Assurance System, a construction company can achieve and reap the benefits of having such a system in place.

Quality Assurance exists because of the degree of dissatisfaction experienced by the industry's clients over a long period, combined with a growing impatience by some of their advisers to achieve value for money. An increasing number of building companies are also frustrated by the inadequacy of a system which however valiantly they try, leaves their efforts lacking in some regards.

A revolution has occurred in the assembly of buildings from what was a craft process to one where the critical work of connecting interdependent units is done in the main by semi-skilled labor from a multiplicity of separate employers. This makes great demands upon supervision and management systems.

A Quality System is designed to provide an assurance to Clients, which can be supported through documented records, that all contracts will be completed in accordance with the agreed time, cost and specification. It should also further ensure that the company personnel, sub-contractors and key suppliers are aware of customer requirements and that they are fully met. Conformance with requirements of the detailed procedures developed in accordance with the Quality Manual has to be mandatory for all staff employed in the company. It is essential to the system that encouragement is given to each employee to develop and maintain an attitude of continuing quality improvement and customer satisfaction.

Quality Assurance is concerned with developing and planning the necessary technical and managerial competence to achieve desired results. It is also about attitudes, both of management and of all those for whom they are responsible.

2.1.5.3. QUALITY CONTROL

Quality Control is a process through which a business seeks to ensure that product quality is maintained or improved and manufacturing errors are reduced or eliminated. Quality control requires the business to create an environment in which both management and employees strive for perfection. This is done by training personnel, creating benchmarks for product quality, and testing products to check for statistically significant variations.

A major aspect of quality control is the establishment of well-defined controls. These controls help standardize both production and reactions to quality issues. Limiting room for error by specifying which production activities are to be completed by which personnel, reduces the chance that employees will be involved in tasks for which they do not have adequate training. Quality Management Systems, (2013) stated that, quality control is the process of evaluating whether construction projects adhere to specific standards. The main objective of quality control is safety. Additionally, quality control is also meant to ensure that buildings are reliable and sustainable.

The ISO definition also states that quality controls the operational techniques and activities that are used to fulfill requirements for quality. This definition could imply that any activity whether serving the improvement, control, management or assurance of quality could be a quality control activity. What the definition fails to tell us is that controls regulate performance. They prevent change and when applied to quality, it regulates quality performance and prevent undesirable changes in the quality standards. It continued that quality control is a process for maintaining standards and not for creating them. Standards are maintained through a process of selection, measurement and correction of work, so that only those products or services which emerge from the process meet the standards.

In other terms quality control prevents undesirable changes being present in the quality of the product or service being supplied. The simplest form of quality control is illustrated in the Figure below. Quality control can be applied to particular products, to processes which produce the products or to the output of the whole organization by measuring the overall quality performance of the organization.

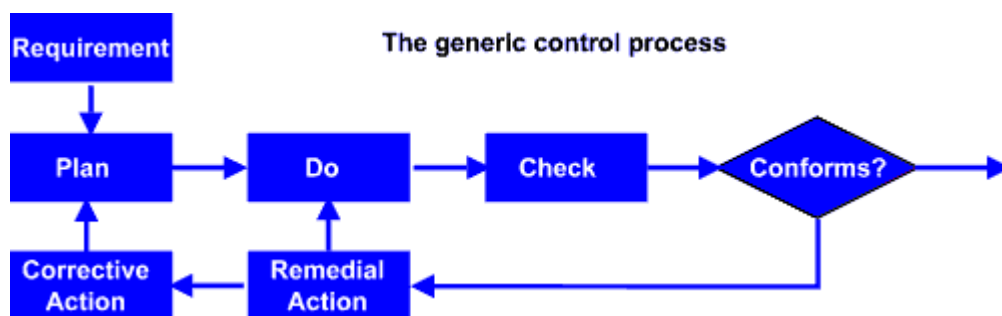


Fig 2.2. The generic control process (Source: *Quality Management Systems, 2013*)

It is often deemed that quality assurance serves prevention and quality control detection but a control installed to detect failure before it occurs serves prevention such as reducing the tolerance band to well within the specification limits. So quality control can prevent failure. Assurance is the result of an examination whereas control produces the result. Quality Assurance does not change the product, Quality Control does.

Harris and McCaffer, (2001) defined quality control as a set of activities or techniques whose purpose is to ensure that all quality requirements are being met. In order to achieve this purpose, processes are monitored and performance problem are solved.

Satterfield, (2005) in other words said quality control is critically important to a successful construction project and should be adhered to throughout a project from conception and design to construction and installation. Inspection during construction will prevent costly repairs after the project is completed. The inspector, engineer, contractor, funding agency, permit agency, and system personnel must work together to inspect, document, and correct deficiencies.

IMPORTANCE OF QUALITY CONTROL IN CONSTRUCTION

Quality Control (QC) in construction is the process of verifying that the project is built to plan, that the tolerances allowable by industry standard and engineering practices have been met or bettered, and that the finished project (and all phases to get there) meet with the quality standards of the architect, engineer, owner, and general contractor.

In construction projects there are dozens of subcontractors, all of which have specific responsibilities. Superintendents and project managers try to maintain high quality standards but they can't be everywhere at once inspections by cities and counties (as well as other jurisdictions, depending on the project) help to ensure safety and code issues.

In addition, a good general contractor or developer will have on staff a QC person, someone who is responsible for going through the building or project, ensuring compliance, and maintaining an ongoing list of corrective items that must be accomplished before the contractor who installed it is paid or leaves the job. QC technicians generally keep a very detailed binder, separated by areas/rooms/phases of the project with notes of items that must be either verified or corrected, with sign-off as each is accomplished.

2.1.5.4. QUALITY IMPROVEMENT

The Heath Foundation, (2009), said there no single definition of quality improvement and no one approach appears to be more successful than another. However, there are a number of definitions that describe quality improvement as a systematic approach that uses specific techniques to improve quality. The most important ingredient in successful and sustained improvement is the way in which the change is introduced and

implemented. According to ISO 9000:2000 Quality improvement is "Part of quality management focused on increasing the ability to fulfill quality requirements."

Quality improvement refers to the application of methods and tools to close the gap between current and expected levels of quality by understanding and addressing system deficiencies and strengths to improve, or in some cases, re-design project processes. A variety of quality improvement approaches exists, ranging from individual performance improvement to redesign of entire project processes. These approaches differ in terms of time, resources, and complexity, but share the four steps in quality improvement: identify analyze, develop and tests.

Empirical studies on quality management in construction have shown that various quality improvement practices are common among non-residential builders and developers. Most of these practices have been collectively grouped under a successful management philosophy termed, "Total Quality Management" or TQM. (Shofoluwe et al 2012)

In general, quality improvement is the systematic approach to the processes of work that looks to remove waste, loss, rework, and frustration. In order to make the processes of work more effective, efficient, and appropriate.

2.1.6. CHALLENGES IN QUALITY MANAGEMENT PRACTICE IN CONSTRUCTION PROJECTS

Quality can be assured by identifying and eliminating the factors that cause poor project performance (Lepartobiko, 2012). The project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project, lack of contractor experienced topped the quality related cause of project failure. Good quality in the context of projects and programs as being to meet the customer requirement, meet the specifications, solve the problem, fit the purpose and satisfy the customer in this case the community who are served by the project. Most of the scholars agree that project quality in construction sector is affected by various internal and external factors. (Turner, 2000)

Quality is one of the main concerns in project management depending on the nature of the project especially in developing countries including Ethiopia. According to (Birhanu, 2014) the root causes of quality problems which contributed to weak quality management practices in Ethiopia are leadership problems, lack of policy and strategy, inefficient resources management, inefficient process management, lack of customer focus and weak business performance.

2.2. EMPERICAL REVIEW

A preliminary study by Chin-Keng, T. (2011) explores preliminarily the practices of quality management, management commitment in quality management, and quality management implementation problems in construction projects in the context of Malaysian construction industry, The findings of the study indicate that 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 strengthen and there are problems in relation to quality management implementation that require attention.

The study undertaken by Daniel Ofori (2013) to identify and assess the quality of project management practices as well as the critical success factors for projects in Ghana, indicates 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.

Further study by Agbenyega (2014) in quality management practices of construction firms in Ghana with the aim in solving the potential barriers are the main measures to be taken, namely: management commitment, communication between managers and employees, employee involvement, detailed and logical work program, regular inspection, quality audit report, lack of training and education of team members and review and analysis.

A study by Teena (2014) 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. The study showed that the factors which affect quality are Design, Lack of communication, Accordance 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 and contractual documents.

Another research made by Birhanu (2011) 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. Comparatively, the service industries quality management practice is weaker than that of the manufacturing industries as measured by all the quality parameters. The findings shows that the reasons for poor quality practice are: Lack of awareness about the basic concepts of quality and customer's inadequate knowledge about quality. 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

2.3. CONCEPTUAL FRAMEWORK

Studies stated above reveals factors that affect implementation of project quality management which can be summarized as top management involvement, communication, training, quality management policy and strategy, resource management, regular supervision, acceptance of quality management system, realistic deadline, and adequate technical skill.

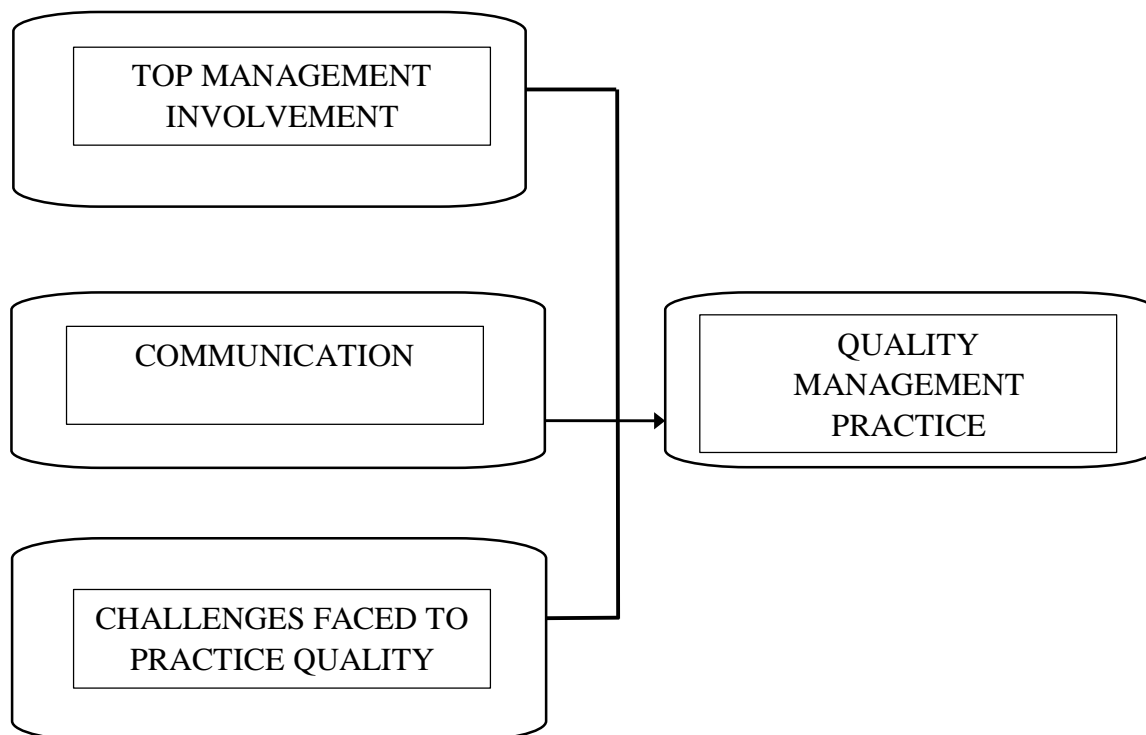


Fig2.3. Conceptual frame work (own source)

CHAPTER THREE: RESEARCH METHODOLOGY

INTRODUCTION

According to Kumar (1999) a research design is a procedural plan that is adopted by researchers to answer questions objectively, accurately, economically with validity.

In this chapter the research methodology applied in carrying out the study will be explained. Accordingly, the kind of research design, type of data used, sources of data, sampling technique, data collection and analysis procedure will be explained with the corresponding justifications.

3.1 RESEARCH DESIGN

Crosswell & Plano Clark (2011) stated that descriptive survey method is a method of investigation which attempts to describe and interpret what exists at present in the form of conditions, practice, process, trends, effects, attitudes, beliefs, etc. Accordingly In this study a descriptive survey method was used to measure the characteristics described in the research question. . It's goal is to describe relevant aspects of the phenomena of interest (Sekaran, 2003).

The researcher used quantitative research method. Quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures (Creswell, 2009).

3.2 POPULATION OF THE STUDY

According to (Blumberg et al., 2005) population is considered as a total collection of elements about which we wish to make some inferences. Therefore, the target population for this study was Ethiopian road authority road project. This population helps to forms the basis from which the sample has drawn. The population size of the study are 75 personnel and experts in Ethiopian road authority who are concerned with quality management in the projects.

3.3 SAMPLE SIZE AND SAMPLING TECHNIQUE

Sampling provides a valid alternative when it would be impracticable to survey the entire population or there is budget or time constraint.

The sampling size was determined by the equation to calculate a sample size as presented below.

$n = \frac{N}{1 + N * e^2}$	Where n stands for number of sample, N stands population size, and 'e' stands for margin of error.
-----------------------------	----------------------------------------------------------------------------------------------------

In this study the confidence interval used were 95% hence 'e' = 0.05 from the formula the sample size was 63 which will be distributed to project manager, resident engineer, quality management team member, counterpart engineer and project consultants who are working under ERA road projects.

Purposive sampling technique was used to select central region for its accessibility of the projects. The sample for this study contains purposively selected professionals who are concerned with managing quality in these projects.

3.4 DATA COLLECTION

The study used both primary and secondary data to obtain sufficient and relevant data that helps to answer the research questions and achieve research objectives. Therefore, in this study, close ended questionnaires and open ended question were employed as a primary data collection. And the secondary data that is relevant to the study was collected through relevant books, text books, journals, organization's past written documents on the relevant issues were used. Moreover, available organizational documents such as quality management manuals were also reviewed.

A Likert Scale, which is a five point scale was used to allow the individual to express how much they agree or disagree with a particular statement in the questionnaire. The questionnaire was developed by referring different literatures and modifying according to the objectives of this study. The questionnaire had four parts which enabled to collect information on quality management practice in Ethiopian road authority road projects. The questionnaire had been developed in English. Then after, data was administered by self and email.

3.6 DATA ANALYSIS

The data collected was coded, and analyzed using descriptive statistical methods like mean, standard deviation and percentages through SPSS (statistical package for social sciences) version 20. Afterward the statistical tools were aligned with the objectives of the study.

3.7 VALIDITY AND RELIABILITY

3.7.1. Validity

Validity determines whether the research tools truly measure what they are intended to measure (Golafshani, 2003).

3.7.2. Reliability

Reliability refers to internal consistency or dependability of a measuring instrument. Internal consistency of items incorporated in the instrument are checked by using Cronbach Alpha. The following table shows the SPSS result on the Cronbach Alpha.

3.6.2.1. Reliability statistics of top management responsibility to practice quality management

Reliability Statistics

Cronbach's Alpha	N of Items
.935	18

Table 3.6.2.1. Reliability statistics of top management responsibility to practice quality management

3.6.2.2. Reliability statistics of practice proper communication of project quality information

Reliability Statistics

Cronbach's Alpha	N of Items
.880	6

Table 3.6.2.2. Reliability statistics of proper communication of project quality information

3.6.2.3. Reliability statistics of challenges faced to practice quality management

Reliability Statistics

Cronbach's Alpha	N of Items
.764	7

Table 3.6.2.2. Reliability statistics challenges faced to practice quality management

Reliability Statistics

Generally, cronbach's alpha of all the three variables are shown in the above table for to be 0.935, 0.88 and 0.764, which reflects an acceptable internal consistency for all three variables as they all are greater than the acceptable percentage (.7).

3.8 ETHICAL CONSIDERATION

The researcher had an authorization from the management of the target company ERA before carrying out the research. A letter from school of commerce were also had been given to the company before data collection. All information obtained in this research was strictly used for academic purposes and respondents were assured of the confidentiality of the information they provided.

CHAPTER FOUR: RESULTS AND DISCUSSION

This chapter presents the analysis, discussions and findings on the practice of quality management in Ethiopian road authority road projects. The researcher administered questionnaires to collect the data. The data collected was 51 questioner with 81% response rate which was analyzed using SPSS 20 to be able to come up with results.

The first part tries to present the demographic characteristics of the respondents, then the second part shows the level of top management involvement to practice quality management accordingly six ISO,9001 principles were undertaken. The third part of the results and discussion contains the findings towards identifying and understanding the level proper communication in in their projects. Finally, the fourth part is focused to identify the challenges faced in the activities of the projects and also will discuss the mechanisms used by the projects to solve these challenges.

4.1. Demographic Characteristics Of The Respondents

Role of the Respondents	Experience(Years)			Total
	<5	5 to 10	11 to 15	
Project Manager	0	3	2	5
Counterpart engineer	5	6	1	12
Project consultancy	5	4	0	9
Resident Engineer	3	5	0	8
Quality department team member	3	3	2	8
Technical team member	3	4	2	9
Total No.	19	25	7	51
Percent	37.26%	49.01%	13.76%	100%

Table4.1. Demographic Characteristics of the Respondents (Own source)

The table demonstrated above shows that the work experience of the participants from the road projects. Accordingly, 37.26% of respondents have served up to five years, 49.01% of the respondents have an experience of five to ten years 13.76% have an experience of eleven to fifteen years in road project.

4.2 Top Management Involvement In Quality Management In Era Road Projects

In this section the level of top management involvement in quality management in era road projects will be analyzed with ISO 9001 principles.

4.2.1 Top management with regards to Leadership

LD1: There is top management support in the project activities		
Rating	Frequency	Percent
Poor	5	9.8%
Average	12	23.5%
Good	19	37.3%
Very Good	15	29.4%
Total	51	100.0%
Mean	3.8627	
Std. Deviation	0.95958	
LD2: The leadership establish a vision and direction for the organization		
Rating	Frequency	Percent
Poor	0	0
Average	10	19.6%
Good	27	52.9%
Very Good	14	27.5%
Total	51	100.0%
Mean	4.0784	
Std. Deviation	0.68828	
LD3: The leadership is able to establish trust		
Rating	Frequency	Percent
Poor	2	3.9%
Average	9	17.6%

Good	29	56.9%
Very Good	11	21.6%
Total	51	100.0%
Mean	3.9608	
Std. Deviation	0.74728	

Table 4.2.1. Top management with regards to Leadership(Own source)

From the table 4.2.1. Shown above under LD1 19(37.3%) and 15(29.4%) of respondents have agreed that there is good and very good top management support in the project activities while 12(23.5%) and 5(9.8%) of respondents have rated that there is average and poor top management support in the project activities respectively. The mean of the response from all the respondents is 3.86 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.96. This indicates the mean rating to be good regarding the involvement of top management in project activities.

Under LD2 in the table 4.2.1. 27(52.9%) and 14(27.5%) of respondents have rated that there is good and very good established vision and direction set by the leadership in the organization while 10(19.6%) of respondents have rated that there is an average established vision and direction set by the leadership in the organization respectively. The mean of the response from all the respondents is 4.08 (4 being rated as Good and 5 being rated as Very good) with standard deviation of 0.69. This indicates the mean rating to be good regarding the vision and direction set by the leadership in the organization.

Under LD3 in the table 4.2.1. 29(56.9%) and 11(21.6%) of respondents have rated that there is good and very good established trust by the leadership while 9(17.6%) and 2(3.9%) of respondents have rated that there is an average and poor established trust by the leadership respectively. The mean of the response from all the respondents is 3.96 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.74. This indicates the mean rating to be good regarding the established trust by the leadership.

4.2.2. Top management with regards to customer focus

CF1: The project understands the needs of existing and future customers		
Rating	Frequency	Percent
Very poor	2	3.9%
Poor	7	13.7%
Average	12	23.5%
Good	16	31.4%
Very Good	14	27.5%
Total	51	100%
Mean	3.6471	
Std. Deviation	1.14584	
CF2: The project activities meets customer requirements		
Rating	Frequency	Percent
Poor	13	25.5%
Average	8	15.7%
Good	24	47.1%
Very Good	6	11.8%
Total	51	100.0%
Mean	3.4510	
Std. Deviation	1.00625	
CF3: The project measures customer satisfaction.		
Rating	Frequency	Percent
Poor	4	7.8%
Average	33	64.7%
Good	10	19.6%
Very Good	4	7.8%
Total	51	100.0%
Mean	3.2745	
Std. Deviation	0.72328	
CF4: The project aims to exceed customer expectations.		

Rating	Frequency	Percent
Very poor	7	13.7%
Poor	13	25.5%
Average	14	27.5%
Good	17	33.3%
Total	51	100.0%
Mean	2.8039	
Std. Deviation	1.05867	

Table 4.2.2. Top management with regards to Customer focus (Own source)

From the table 4.2.2. Shown above under CF1 1(2.0%) and 24(47.1%) of respondents have agreed that there is good and very good understanding of the need of existing and future customer need in the project while 7(13.7%) and 6(11.8%) of respondents have rated that there is average and poor understanding of the need of existing and future customer need in the project respectively. The mean of the response from all the respondents is 3.6 (3 being rated as Average and 4 being rated as Good) with standard deviation of 1.33. This indicates the mean rating to be good regarding the understanding of the need of existing and future customer need in the project.

Under CF2 in the table 4.2.1. 24(47.1%) and 6(11.8%) of respondents have rated that projects activates are good and very good at meeting the requirement of customer needs while 8(15.7%) and poor 13(25.5%) of respondents have rated that projects activates are there is an average at meeting the requirement of customer needs respectively. The mean of the response from all the respondents is 3.45 (3 being rated as Average and 4 being rated as Good) with standard deviation of 1.0. This indicates the mean rating to be average regarding the project activities meeting the requirement of customer needs.

Under CF3 in the table 4.2.2. 10(19.6%) and 4(7.8%) of respondents have rated good and very good in measuring customer satisfaction by the project while 33(64.7%) and 4(7.8%) of respondents rated average and poor in measuring customer satisfaction by the project respectively. The mean of the response from all the respondents is 3.27 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.72. This indicates the mean rating to be average regarding the project measuring customer satisfaction.

Under CF4 in the table 4.2.2. 17(33.3%) and 14(27.5%) of respondents have rated good and average in exceeding customer expectation by the project while 13(25.5%) and 7(13.7%) of respondents rated poor and very poor in exceeding customer expectation by the project respectively. The mean of the response from all the respondents is 2.80 (2 being rated as Poor and 3 being rated as Average) with standard deviation of 1.0. This indicates the mean rating to be average regarding the project exceeding customer expectation.

4.2.3 Top management with regards to engagement with people

EP1: The project ensures that people’s abilities are used and valued		
Rating	Frequency	Percent
Poor	8	15.7%
Average	17	33.3%
Good	23	45.1%
Very Good	3	5.9%
Total	51	100.0%
Mean	3.4118	
Std. Deviation	0.82889	
EP2: There is evaluation of individual performance in the project activities.		
Rating	Frequency	Percent
Poor	3	5.9%
Average	18	35.3%
Good	12	23.5%
Very Good	18	35.3%
Total	51	100.0%
Mean	3.8824	
Std. Deviation	0.97256	
EP3: The project facilitates learning and knowledge sharing within the project activities.		

Rating	Frequency	Percent
Poor	2	3.9%
Average	17	33.3%
Good	13	25.5%
Very Good	19	37.3%
Total	51	100.0%
Mean	3.9608	
Std. Deviation	0.93725	

Table 4.2.3. Top management with regards to engagement with people(Own source)

From the table 4.2.3. Shown above under EP1 23(45.1%) and 3(5.9%) of respondents have agreed that there is good and very good at ensuring that people's abilities are used and valued within the project while 17(13.7%) and 8(15.7%) of respondents have rated that there is average and poor at ensuring that people's abilities are used and valued within the project respectively. The mean of the response from all the respondents is 3.41 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.84. This indicates the mean rating to be average regarding the understanding of the need of existing and future customer need in the project.

Under the table 4.2.3. Shown above under EP2 12(23.5%) and 18(35.3%) of respondents have agreed that there is good and very good at evaluating individual performance in the project activities while 18(35.3%) and 3(5.9%) of respondents have rated that there is average and poor at evaluating individual performance in the project activities respectively. The mean of the response from all the respondents is 3.88 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.97. This indicates the mean rating to be good regarding the evaluation of individual performance in the project activities

Under the table 4.2.3. Shown above under EP3 13(25.5%) and 19(37.3%) of respondents have agreed that there is good and very good facilitation of learning and knowledge sharing within the project activities while 17(33.3%) and 2(3.9%) of respondents have rated that there is average and poor facilitation of learning and knowledge sharing within the project activities respectively. The mean of the response from all the respondents is 3.96 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.94.

This indicates the mean rating to be good facilitation of learning and knowledge sharing within the project activities

4.2.4. Top management with regards to improvement within the project

IP1: Activities are performed to improve project performance and capabilities		
Rating	Frequency	Percent
Poor	4	7.8%
Average	12	23.5%
Good	15	29.4%
Very Good	20	39.2%
Total	51	100.0%
Mean	4.0000	
Std. Deviation	0.97980	
IP2: The project empower people to make improvements		
Rating	Frequency	Percent
Poor	6	11.8%
Average	11	21.6%
Good	26	51.0%
Very Good	8	15.7%
Total	51	100.0%
Mean	3.7059	
Std. Deviation	0.87850	

Table 4.2.4. Top management with regards to improvement within the project(Own source)

From the table 4.2.4. Shown above under IP1 15(29.1%) and 20(39.2%) of respondents have agreed that there is good and very good activities performed to improve project performance and capabilities while 12(23.5%) and 4(7.8%) of respondents have rated that there is average and poor activities performed to improve project performance and capabilities. The mean of the response from all the respondents is 4.0 (4 being rated as Good) with standard deviation of 0.97. This indicates the mean rating to be good regarding activities performed to improve project performance and capabilities

Under the table 4.2.4. Shown above under IP2 26(51.0%) and 8(15.7%) of respondents have agreed that there is good and very good empowerment of people to make improvement in the project while 11(21.6%) and 6(11.8%) of respondents have rated that

there is average and poor empowerment of people to make improvement in the project respectively. The mean of the response from all the respondents is 3.7 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.87. This indicates the mean rating to be good facilitation of empowerment of people to make improvement in the project

4.2.5. Top management with regards to evidence-based decision-making

EDM1: The project ensures the accessibility of accurate and reliable data		
Rating	Frequency	Percent
Poor	3	5.9%
Average	13	25.5%
Good	17	33.3%
Very Good	18	35.3%
Total	51	100.0%
Mean	3.9804	
Std. Deviation	0.92715	
EDM2: Decisions taken by the project are made based on analysis of data .		
Rating	Frequency	Percent
Poor	3	5.9%
Average	12	23.5%
Good	25	49.0%
Very Good	11	21.6%
Total	51	100.0%
Mean	3.8627	
Std. Deviation	0.82510	

EDM3: The project balance data analysis with practical experience.		
Rating	Frequency	Percent
Poor	4	7.8%
Average	14	27.5%
Good	29	56.9%
Very Good	4	7.8%
Total	51	100.0%
Mean	3.6471	
Std. Deviation	0.74360	

Table 4.2.5. Top management with regards to evidence-based decision-making(Own source)

From the table 4.2.4. Shown above under EDM1 15(33.3%) and 18(35.3%) of respondents have agreed that there is good and very good accessibility of accurate and reliable data ensured by the project while 13(25.5%) and 3(7.8%) of respondents have rated that there is average and poor accessibility of accurate and reliable data ensured by the project respectively. The mean of the response from all the respondents is 3.98 (3 being rated as Average and 4 as Good) with standard deviation of 0.92. This indicates the mean rating to be good regarding accessibility of accurate and reliable data ensured by the project.

From the table 4.2.4. Shown above under EDM2 25(49.0%) and 11(21.6%) of respondents have agreed that there is good and very good decision taken by the project are made based on analysis of data while 12(23.5%) and 3(5.9%) of respondents have rated that there is average and poor decision taken by the project are made based on analysis of data respectively. The mean of the response from all the respondents is 3.86 (3 being rated as Average and 4 as Good) with standard deviation of 0.83. This indicates the mean rating to be good regarding decision taken by the project are made based on analysis of data.

From the table 4.2.4. Shown above under EDM3 29(56.9%) and 4(7.8%) of respondents have agreed that there is good and very good at project balance data analysis with practical experience while 14(27.5%) and 4(7.8%) of respondents have rated that there is average and poor at project balance data analysis with practical experience respectively. The mean

of the response from all the respondents is 3.64 (3 being rated as Average and 4 as Good) with standard deviation of 0.74. This indicates the mean rating to be good at project balance data analysis with practical experience.

4.2.6. Top management with regards to relationship management

RM1: The project can identify and select suppliers to manage costs and create value		
Rating	Frequency	Percent
Poor	3	5.9%
Average	29	56.9%
Good	16	31.4%
Very Good	3	5.9%
Total	51	100.0%
Mean	3.3725	
Std. Deviation	0.69169	
RM2: Relationships considering both the short and long term is established within the project.		
Rating	Frequency	Percent
Very poor	3	5.9%
Poor	5	9.8%
Average	25	49.0%
Good	12	23.5%
Very Good	6	11.8%
Total	51	100.0%
Mean	3.2549	
Std. Deviation	0.99686	
RM3: There is good share of expertise, resources, information, and plans with partners.		
Rating	Frequency	Percent
Very poor	2	3.9%
Poor	5	9.8%
Average	25	49.0%

Good	14	27.5%
Very Good	5	9.8%
Total	51	100.0%
Mean	3.2941	
Std. Deviation	0.92291	

Table 4.2.6. Top management with regards to relationship management (Own source)

From the table 4.2.6. Shown above under RM1 16(31.4%) and 3(5.9%) of respondents have agreed that there is good and very good at identifying and selecting suppliers to manage cost and create value in the projects while 29(56.9%) and 3(5.9%) of respondents have rated that there is average and poor at identifying and selecting suppliers to manage cost and create value in the projects respectively. The mean of the response from all the respondents is 3.37 (3 being rated as Average and 4 as Good) with standard deviation of 0.69. This indicates the mean rating to be average in identifying and selecting suppliers to manage cost and create value in the projects.

Under RM2 in the table 4.2.2. 12(23.5%) and 6(11.8%) of respondents have rated good and very good in established relationship considering both the short and long term within the project while 25(49.0%), 5(9.8%) and 3(5.9%) of respondents rated average, poor and very poor in established relationship considering both the short and long term within the project respectively. The mean of the response from all the respondents is 3.25 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.99. This indicates the mean rating to be average in established relationship considering both the short and long term within the project.

Under RM3 in the table 4.2.2. 14(25.7%) and 5(9.8%) of respondents have rated good and very good in sharing expertise, resource information and plans in the project within the project while 25(49.0%), 5(9.8%) and 2(3.9%) of respondents rated average, poor and very poor in sharing expertise, resource information and plans in the project respectively. The mean of the response from all the respondents is 3.29 (3 being rated as Average and 4 being rated as Good) with standard deviation of 0.92. This indicates the mean rating to be average in sharing expertise, resource information and plans in the project

4.3 Presence Of Proper Communication In Quality Management Within Era Road Projects

In this section the presence of proper communication in quality management in era road projects will be analyzed.

4.3.1. Specific targets and actions for quality improvement are documented by the project team

Rating	Frequency	Percent
Disagree	6	11.8%
Neutral	12	23.5%
Agree	22	43.1%
Strongly agree	11	21.6%
Total	51	100.0%
Mean	3.7451	
Std. Deviation	0.93473	

Table 4.3.1. Specific targets and actions for quality improvement are documented by the project team(Own source)

From the table 4.3.1. Shown above 22(43.1%) and 11(21.6%) of respondents have agreed and strongly agreed that t specific targets and actions for quality improvement are documented by the project team while 12(23.5%) and 6(11.8%) of respondents have neutral and disagreed that Specific targets and actions for quality improvement are documented by the project team respectively. The mean of the response from all the respondents is 3.62 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.93. This shows the mean rating to agree with an inclination to neutral which indicate that most of the time specific targets and actions for quality improvement are documented by the project team.

4.3.2. Specific targets and actions for quality improvement are communicated by the project team.

Rating	Frequency	Percent
Disagree	7	13.7%
Neutral	9	17.6%
Agree	24	47.1%
Strongly agree	11	21.6%
Total	51	100.0%
Mean	3.7647	
Std. Deviation	0.95054	

Table 4.3.2. Specific targets and actions for quality improvement are communicated by the project team(Own source)

From the table 4.3.2. Shown above 24(47.1%) and 11(21.6%) of respondents have agreed and strongly agreed that specific targets and actions for quality improvement are communicated by the project team while 6(17.6%) and 7(13.7%) of respondents have rated neutral and disagreed that specific targets and actions for quality improvement are communicated by the project team respectively. The mean of the response from all the respondents is 3.76 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.95. This shows the mean rating to agree which indicate that most of the time specific targets and actions for quality improvement are communicated by the project team.

4.3.3. Project's quality standards are communicated to the project team and stakeholders.

Rating	Frequency	Percent
Disagree	3	5.9%
Neutral	20	39.2%
Agree	19	37.3%
Strongly agree	9	17.6%
Total	51	100.0%
Mean	3.6667	
Std. Deviation	0.84063	

Table 4.3.3. Project's quality standards are communicated to the project team and stakeholders(Own source)

From the table 4.3.3. Shown above 19(37.3%) and 9(17.6%) of respondents have agreed and strongly agreed that project's quality standards are communicated to the project team and stakeholders while 20(39.2%) and 3(5.9%) of respondents have rated neutral and disagreed that project's quality standards are communicated to the project team and stakeholders respectively. The mean of the response from all the respondents is 3.67 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.81. This shows the mean rating to be neutral with inclination to agree which indicate that most of the time project's quality standards are communicated to the project team and stakeholders.

4.3.4. There is a well-developed feedback mechanism in your project.

Rating	Frequency	Percent
Disagree	4	7.8%
Neutral	35	68.6%
Agree	10	19.6%
Strongly agree	2	3.9%
Total	51	100.0%
Mean	3.1961	
Std. Deviation	0.63308	

Table 4.3.3. There is a well-developed feedback mechanism in your project. (Own source)

From the table 4.3.4. Shown above 10(19.6%) and 2(3.9%) of respondents have agreed and strongly agreed that there is a well-developed feedback mechanism within the project. while 35(68.6%) and 4(7.8%) of respondents have rated neutral and disagreed that there is a well-developed feedback mechanism within the project respectively. The mean of the response from all the respondents is 3.19 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.63. This shows the mean rating to be neutral which indicate that some of the time there is a well-developed feedback mechanism within the project but not always.

4.3.5. Projects gets timely information about customer quality needs

Rating	Frequency	Percent
Strongly disagree	4	7.8%
Disagree	7	13.7%
Neutral	22	43.1%
Agree	16	31.4%
Strongly agree	2	3.9%
Total	51	100.0%
Mean	3.0980	
Std. Deviation	0.96447	

Table 4.3.5. Projects gets timely information about customer quality needs

From the table 4.3.5. Shown above 16(31.4%) and 2(3.9%) of respondents have agreed and strongly agreed that project’s quality standards are communicated to the project team and stakeholders while 22(43.1%), 7(13.7%) and 4(7.8%) of respondents have rated neutral and disagreed that project’s quality standards are communicated to the project team and stakeholders respectively. The mean of the response from all the respondents is 3.09 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.96. This shows the mean rating to be neutral which indicate that some of the time project’s quality standards are communicated to the project team and stakeholders but not always.

4.3.6. Employee's ideas on ways to improve quality in the project are welcomed by the top management.

Rating	Frequency	Percent
Disagree	4	7.8%
Neutral	19	37.3%
Agree	19	37.3%
Strongly agree	9	17.6%
Total	51	100.0%
Mean	3.6471	
Std. Deviation	0.86772	

Table 4.3.6. Employee's ideas on ways to improve quality in the project are welcomed by the top management(Own source)

From the table 4.3.6. Shown above 19(37.3%) and 9(17.6%) of respondents have agreed and strongly agreed that employee's ideas on ways to improve quality in the project are welcomed by the top management while 19(37.3%) and 4(7.8%) of respondents have rated neutral and disagreed that employee's ideas on ways to improve quality in the project are welcomed by the top management respectively. The mean of the response from all the respondents is 3.64 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.87. This shows the mean rating to be agree which indicate that employee's ideas on ways to improve quality in the project are welcomed by the top management.

4.4. Challenges Faced With Regards To Quality Management Within Era Road Projects

In this section the Challenges faced with regards to quality management within ERA road projects will be analyzed.

4.4.1. There is lack of quality management policy and strategy in the project

Rating	Frequency	Percent
Strongly disagree	10	19.6%
Disagree	19	37.3%
Neutral	16	31.4%
Agree	6	11.8%
Total	51	100.0%
Mean	2.3529	
Std. Deviation	0.93431	

Table 4.4.1. There is lack of quality management policy and strategy in the project

From the table 4.4.1. Shown above 6(11.8%) and 16(31.4%) of respondents have agreed and are neutral that there lack of quality management policy and strategy in the project while 19(37.3%) and 10(19.6%) of respondents have rated disagreed and strongly disagreed that there lack of quality management policy and strategy in the project respectively. The mean of the response from all the respondents is 2.35 (2 being rated as Disagree and 3 as Neutral) with standard deviation of 0.93. This shows the mean rating to disagree with the lack of quality management policy and strategy in the project.

4.4.2. There is inefficient resources management in the project

Rating	Frequency	Percent
Disagree	3	5.9%
Neutral	17	33.3%
Agree	27	52.9%
Strongly agree	4	7.8%
Total	51	100.0%
Mean	3.6275	
Std. Deviation	0.72002	

Table 4.4.2. There is inefficient resources management in the project(Own source)

From the table 4.4.2. Shown above 3(5.9%) and 17(33.3%) of respondents have agreed and are neutral that there is inefficient resources management in the project while 27(52.9%) and 4(7.8%) of respondents have rated disagreed and strongly disagreed that there is inefficient resources management in the project respectively. The mean of the response from all the respondents is 3.63 (3 being rated as Neutral and 4 as Agree) with standard deviation of 0.72. This shows the mean rating to agree with inefficient resources management in the project.

4.4.3. There is lack of regular supervision

Rating	Frequency	Percent
Strongly disagree	3	5.9%
Disagree	20	39.2%
Neutral	18	35.3%
Agree	8	15.7%
Strongly agree	2	3.9%

Total	51	100.0%
Mean	2.7255	
Std. Deviation	0.93975	

Table 4.4.3. There is lack of regular supervision(Own source)

From the table 4.3.1. Shown above 8(15.7%) and 2(3.9%) of respondents have agreed and strongly agreed that there is lack of regular supervision in the projects while 18(35.3%), 20(39.2%) and 3(5.9%) of respondents have rated neutral, disagreed and strongly disagreed that there is lack of regular supervision in the projects respectively. The mean of the response from all the respondents is 2.72 (2 being rated as Disagree and 3 as Neutral) with standard deviation of 0.93 this shows the mean rating to be neutral with inclination to disagree which indicate that there is lack of regular supervision in the projects but not always.

4.4.4. There is unwillingness of project staff to accept the quality management system

Rating	Frequency	Percent
Strongly disagree	16	31.4%
Disagree	21	41.2%
Neutral	10	19.6%
Agree	4	7.8%
Strongly agree	0	0
Total	51	100.0%
Mean	2.0392	
Std. Deviation	0.91566	

Table 4.4.4. There is unwillingness of project staff to accept the quality management system(Own source)

From the table 4.3.4. Shown above 4(7.8%) and 10(19.6%) of respondents have agreed and are neutral that there is unwillingness of project staff to accept the quality management system while 21(41.2%) and 16(31.4%) of respondents have rated disagreed and strongly disagreed that that there is unwillingness of project staff to accept the quality management system respectively. The mean of the response from all the respondents is 2.03 (2 being rated as Disagree and 3 as Neutral) with standard deviation of 0.91. This shows the mean

rating to disagree with unwillingness of project staff to accept the quality management system.

4.4.5. There is lack adequate of training in quality management for employees

Rating	Frequency	Percent
Strongly disagree	16	31.4%
Disagree	21	41.2%
Neutral	10	19.6%
Agree	4	7.8%
Total	51	100.0%
Mean	2.0392	
Std. Deviation	0.91566	

Table 4.4.5. There is lack adequate of training in quality management for employees(Own source)

From the table 4.3.5. Shown above 4(7.8%) and 10(19.6%) of respondents have agreed and are neutral that there is lack adequate of training in quality management for employees while 21(41.2%) and 16(31.4%) of respondents have rated disagreed and strongly disagreed that there is lack adequate of training in quality management for employees respectively. The mean of the response from all the respondents is 2.04 (2 being rated as Disagree and 3 as Neutral) with standard deviation of 0.916. This shows the mean rating to disagree with lack of adequate training in quality management for employees.

4.3.6. The deadline of the project is unrealistic

Rating	Frequency	Percent
Strongly disagree	7	13.7%
Disagree	11	21.6%
Neutral	14	27.5%
Agree	13	25.5%

Strongly agree	6	11.8%
Total	51	100.0%
Mean	3.0000	
Std. Deviation	1.23288	

Table 4.3.6. The deadline of the project is unrealistic

From the table 4.3.1. Shown above 13(25.5%) and 6(11.8%) of respondents have agreed and strongly agreed that there is unrealistic deadline within the projects while 14(27.5%), 11(21.6%) and 7(13.7%) of respondents have rated neutral, disagreed and strongly disagreed that that there is unrealistic deadline within the projects respectively. The mean of the response from all the respondents is 3.0 (2 being rated as Disagree and 3 as Neutral) with standard deviation of 1.23 this shows the mean rating to be neutral with regards to unrealistic deadline within the projects.

4.3.7. Technical skill in the project is in adequate

Rating	Frequency	Percent
Strongly disagree	8	15.7%
Disagree	12	23.5%
Neutral	20	39.2%
Agree	11	21.6%
Total	51	100%
Mean	2.6667	
Std. Deviation	0.99331	

Table 4.3.7. Technical skill in the project is in adequate(Own source)

From the table 4.3.1. Shown above 11(21.6%) and 20(39.2%) respondents have agreed and are neutral that there is adequate technical skill within projects while 12(23.5%) and 8(15.7%) of respondents have rated disagreed and strongly disagreed that there is adequate technical skill within projects respectively. The mean of the response from all the respondents is 3.0 (2 being rated as Disagree and 3 as Neutral) with standard deviation of

1.23 this shows the mean rating to be neutral with regards to adequate technical skill within the projects.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

In this chapter conclusion will be made based on the finding obtained from the data analysis on assessing quality management practice in Ethiopian road authority road projects and also recommendation for future action will be given by the researcher.

5.1 CONCLUSION

From the finding obtained from the data analysis to assess the quality management practice in Ethiopian road authority road projects top management involvement, communication of quality management information and challenges faced are covered and from these conclusion are drawn

1. Top management responsibility towards quality management in Ethiopian road authority

- I. Top management is rated as good with regards to support in project activities, setting vision, direction and building trust in the organization.
- II. Top management is rated as good at understanding the needs of existing and future need of customer in the projects while it is rated as an average in meeting customer requirement, measuring customer satisfaction and aiming to exceed customer satisfaction in the project activities.
- III. Top management is rated as good at performing activities to improve project performance and capabilities it is also rated as good at empowering people to make improvement
- IV. Top management is rated as good at evaluating individual performance and facilitating learning and knowledge sharing in the project activities while it is rated as an average in ensuring people's abilities are used and valued
- V. Top management is rated as an average in identifying and selecting suppliers to manage costs and create value in the project, in building relations both long and short terms and in sharing expertise, resource information and plans in the project.

2. *Communication of project quality information in Ethiopian road authority road projects*

- I. Specific targets and actions for quality improvement are communicated and documented by the project team but not always
- II. There is a well-developed feedback mechanism within the project but not always
- III. Project's quality standards are communicated to the project team and stakeholders but not always
- IV. Employee's ideas on ways to improve quality in the project are welcomed by the top management

3. *Challenges faced by Ethiopian road authority road projects*

- I. In ERA road projects there is inefficient resources management in the projects
- II. Even though there is regular supervision in the projects it is not adequate in the projects
- III. With regards to the unrealistic deadline of the ERA road projects the finding show that to be neutral
- IV. Most technical skills within ERA road projects are adequate but not always
- V. However, there is quality management policy and strategy, adequate training in quality management for employees and also there is willingness of project staff to accept the quality management system in ERA road projects

RECOMMENDATIONS

This study assesses quality management practice in Ethiopian road authority road projects accordingly top management involvement, communication of quality management information and challenges faced by the project are addressed moreover based on the findings these recommendations are listed

- Specific targets and actions for quality improvement should be communicated and documented by the project team regularly and attentively.
- Even though there is a well-developed feedback mechanism within the projects these mechanisms should be used regularly and properly and much attention must be given to it to update and improve it,
- The projects should exceed their customer focus in meeting customer requirement, measuring customer satisfaction and aiming more than average to exceed customer satisfaction in the project activities.
- The projects must ensure people's abilities are used and valued in their projects since human resources are direct input to project activities
- Since the projects have inefficient resources management the resources are wasted and are not utilized on the right work or are used which will compromise the quality so the projects should insure that there are mechanisms laid out to make sure the resources are placed, valued and are used in the right project activity.
- The projects should have sufficient and adequate supervision of the project activities from the major stakeholders
- The project should ensure that the technical skills within projects are adequate and fit for the project activity they are undertaking

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APPENDIX

QUESTIONNAIRE
ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

Dear respondent,

The purpose of this questionnaire is to collect data on “**Assessment of Quality Management Practices: The case of Ethiopian road authority road projects**” conducted for partial fulfillment of Masters of Art in project Management.

Believing that your frank and genuine responses will contribute vastly to the quality of the findings of this study, I would like to request you to kindly complete this questionnaire based on your expertise which will be kept confidentially for the study purpose.

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

Hrit Zemichael 0911707634 or hritze77@gmail.com

PART ONE: DEMOGRAPHICAL INFORMATION

Please put a “X” mark to all your responses in or (next) to the box provided beside each statement.

1. What is your role in the project you are involved in?

- Project Manager Counterpart engineer Project Consultant
- Resident engineer Quality management team member Technical team member

2. Your total work experience in road projects

- Less than 5 years 5-10years 11-15 years 16 and above

PART TWO: TOP MANAGEMENT INVOLVMENT

This part of the questionnaire will help the researcher to identify “*Top management involvement to practice quality management in your project*”. Please show your response to the statements by putting a “X” mark to all your responses to the following scale rating description: **1= Very Poor 2=Poor 3=Average 4=Good 5=Very Good**

Group	Item	Description	Rating				
			5	4	3	2	1
Leadership	LD1	Top management supports the project activities					
	LD2	Top management have established a vision and direction for the organization					
	LD3	Top management is able to establish trust					
Customer focus	CF1	The project understands the needs of existing and future needs of the client					
	CF2	The project activities meets clients requirements					
	CF3	The project measures customer satisfaction.					
	CF4	The project aims to exceed clinets expectations.					
Engagement with people	EP1	The project ensures that people’s abilities are used and valued					
	EP2	There is evaluation of individual performance in the project activities.					
	EP3	The project facilitates learning and knowledge sharing within the project activities.					
Improvement within the project	IP1	Project activities are performed to improve project performance and capabilities					
	IP2	The project empower people to make improvements					

Evidence based decision making	EDM1	The project ensures the accessibility of accurate and reliable data					
	EDM2	Decisions taken by the project are made based on analysis of data					
	EDM3	The project balance data analysis with practical experience					
Relationship Management	RM1	The projects identify and select suppliers to manage costs and create value.					
	RM2	Relationships considers both the short and long term established within the project					
	RM3	Partners share expertise, resource information and plans in the project					

PART THREE: COMMUNICATION

This part of the questionnaire will help the researcher to identify the “*The level proper communication of quality information in your project*”. Please show your response to the statements by putting “X” mark to all your responses to the following scale rating description:

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree

Item	Description	Rating				
		5	4	3	2	1
COM1	Specific targets and actions for quality improvement are documented by the project team.					
COM2	Specific targets and actions for quality improvement are communicated by the project team.					
COM3	Project’s quality standards are communicated to the project team and stakeholders.					
COM4	There is a well-developed feedback mechanism in your project.					
COM5	Your project gets timely information about customer quality needs					
COM6	Employee's ideas on ways to improve quality in the project are welcomed by the top management.					

PART FOUR: CHALLENGES TO PRACTICE QUALITY MANAGEMENT

This part of the questionnaire will help the researcher to identify the “*The challenge to practice quality management in your project*”. Please show your response to the statements by putting “X” mark to all your responses to the following scale rating description: **1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree**

Item	Description	Rating				
		5	4	3	2	1
CH1	There is lack of quality management policy and strategy in the project					
CH2	There is inefficient resources management in the project					
CH3	There is lack of regular supervision in the project					
CH4	There is unwillingness of project staff to accept the quality management system					
CH5	There is lack adequate of training in quality management for employees					
CH6	The deadline of the project is unrealistic					
CH7	Technical skill in the project is in adequate					

8. What does your project do to solve these challenges, please list some mechanisms used by your project?

Additional Comments:
