



Addis Ababa University
College of Business and Economics
School of Commerce

**Project Work Title: - ASSESSMENT ON PROJECT MANAGEMENT PRACTICES:
A CASE STUDY ON ETHIOPIA NATIONAL QUALITY INFRASTRUCTURE
INSTITUTES-PROJECT EXPANSION**

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A Final Project Work Submitted to Addis Ababa University College of Business and Economics
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Management

ADVISOR: Dr. Worku Mekonnen

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ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

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Advisor: Worku Mekonnen (PhD)

A PROJECT WORK SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF
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OF MASTER OF ARTS DEGREE IN PROJECT MANAGEMENT

June, 2023
Addis Ababa, Ethiopia

STATEMENT OF DECLARATION

I, Mekonnen Habtemichael, declare that this research study entitled “**Assessment on Project Management Practices: a case study on Ethiopia National Quality Infrastructure Institutes Project Expansion**” was my own study and written by myself. All of the study's sources have been cited properly and acknowledged. The study was not submitted to any university or colleges for a degree.

Mekonnen Habtemichael

Signature: _____ Date: _____

LETTER OF CERTIFICATION

This is to confirm that the project study work entitled “**Assessment on Project Management Practices: a case study on Ethiopia National Quality Infrastructure Institutes–Project Expansion**” is performed within my supervision by Mekonnen Habtemichael. The study work is original and, I believe it is suitable for submission as part of the university requirements for the honor of a MA Degree in Project Management.

Advisor: Dr Worku Mekonnen

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EXAMINING BOARD APPROVAL

Members of board of examiners approve that this research project titled, “**Assessment on Project Management Practices: a case study on Ethiopia National Quality Infrastructure Institutes-Project Expansion**” undertaken by Mekonnen Habtemichael fulfils the requirements for the Degree of Master of Arts in Project Management and complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

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LIST OF ABBREVIATIONS AND ACRONYMS

NQI:	National Quality Infrastructure
QI:	Quality Infrastructure
EAS:	Ethiopian Accreditation Service
IES:	Institute of Ethiopian Standard
NMIE:	National Metrology Institute of Ethiopia
ECAE:	Ethiopian Conformity Assessment Enterprise
CAB:	Conformity Assessment Bodies
FDI:	Foreign Direct Investment
WBG:	World Bank group
ISO:	International Standards Organization
IEC:	International Electrotechnical Commission
IAF:	International Accreditation Forum
ILAC:	International Laboratory Accreditation Cooperation
TBT:	Technical Barriers to Trade
WTO:	World Trade Organization
MoTI:	Ministry of Trade and Industry
PIU:	Project Implementation unit
PMBOK:	Project Management Body of Knowledge
PMI:	Project Management Institute

ABSTRACT

A developing country like Ethiopia is facing a challenge in the international market because of the highly stringent and strict quality requirements of the well-developed country. This is because of an immature national quality infrastructure in a country, this will reduce a business's capability to explore market opportunities, unable to compete on international markets, and limited to participate in the global value chains. Because of this, the Ethiopian Government has undertaken different reformation for upgrading the National Quality infrastructure System in order to reduce the obstacles and enhance the competitiveness of the manufacturing and service sectors in the international trade.

Among those efforts the government had received a fund from the world bank group to strengthening the capacity of the national quality infrastructure institutes. The aim of this project paper is to assess the project management implementation practices.

A descriptive type of study is used to evaluate the practices of project implementation & Project management knowledge areas like scope, schedule, cost, risk, quality, stakeholders, procurement, communication etc. A purposive sampling technique is used to gather the primary data using a web based and hard copy questionnaire instrument. The collected data is analysed with SPSS version 27 software. Mean and standard deviation is used for interpretation of the data that was collected.

As per the findings, most of the project activities were managed properly, however with regard to project activities were not effectively completed, the practices for scheduling tools and technique like CPM or PERT is not good, there is a limitation in addressing the risk timely, appropriate HR management tool are not applied to motivate and reward the employee, project is not closed properly and there is a limitation in the effective communication and dissemination of information to the stakeholders.

This shows that the project is implemented effectively even though there is a limitation with same activities. The project implementation unit of NQI institutes have to give high attention for a best project management practice properly.

Key Words: Project Implementation, international trade, Project Management practice, National Quality infrastructure.

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the project work

In a developing country like Ethiopia, an immature national quality infrastructure (NQI) may affect negatively a business's capability to search a market opportunity, able to compete on global markets, and to participate in the international value chains. Many manufacturers face challenges in demonstrating compliance with quality requirements and trade rules. The governments of Ethiopia strategic focused on the growth of manufacturing, promoting product quality awareness and upgrading to adhere to international product standards. However, it is not easy to many Ethiopian firms to comply with better product standards and quality practices in the global trade. For example, during the 2010–2015 period, there were 19 notifications of rejections of products from the Europe destination markets. The rejections more focus on agricultural products, but they are also symbolic of the quality problems of light manufacturing (Group, Ethiopia National quality Infrastructure Development Project, 2016).

One of the bottlenecks are inadequate internationally recognized services of the National quality infrastructure (NQI) institutions for supporting the firm's competitiveness in the export markets. The quality assurance services given by NQI institutions of Ethiopian will smooths trade if only accepted by relevant foreign CAB. Otherwise, export products need to be tested or/ and inspected or/ and certified again in the receiving country, if not will be blocked at the border not to enter in. Currently the test, inspection and certification services requested by international buyers are not properly provided by the local institutions because of the capacity problems as well as they are not recognized internationally. As a result, firms are forced to pay enormous

costs for their products tested abroad and certified by foreign certification bodies (Clements.S, 2007).

The main problems in the existing Ethiopian NQI institutions includes, the lack of adequate capacity for providing quality assurance services, incapability to meet target market requirements, excessive price of compliance with international standards, lack of human resource capacity, lack of the facility to confirm accurate measurement, lack of well-furnished laboratories to perform testing, as well as lack of collaboration and coordination with statutory bodies to implement quality assurance services (Group, Ethiopia National quality Infrastructure Development Project, 2016).

Based on this the WBG designed a project to support the Government in addressing the major constraints around the NQI system in the country. The proposed project is structured around three components: (a) Component 1: Strengthening Institutional Capacity for NQI Development; (b) Component 2: Enhancing Private Sector Engagement; and (c) Component 3: Project Management and Monitoring and Evaluation (Group, National Quality Infrastructure Development Project (P160279), 2016). Based on this the project will provide support to improve the current quality assurance services.

The existing NQI service providing institutions in Ethiopia are, Ethiopian Standards Institute (ISE), Ethiopian National Accreditation Service (EAS), National Metrology Institute of Ethiopia (NMIE) and Ethiopian Conformity Assessment Enterprise (ECAE).

This project work will assess the National Quality Infrastructure (NQI) project implementation on National Quality infrastructure Institutions

1.2.Statement of the Problem

The global trade has been in a constant state of change since the turn of the century, characterized by a continual evolution in the location of both the most significant producing and exporting countries and regions, and the main end markets. With this regard developing countries like Ethiopia are facing a challenge in the international trade by the different countries non-tariff technical barriers. In order to facilitate the international trade these Technical Barriers to Trade (TBT) like technical regulations, standards, and conformity assessment procedures must not be discriminatory and do not create unnecessary obstacles to trade (WTO, 1994).

Based on this the WTO encourages members to base their measures on international standards as a means to facilitate trade. Through its transparency provisions, it also aims to create a predictable trading environment. Based on the TBT agreement, in order to break the trade barriers in international trade system a national quality infrastructure is important. in breaking down technical barriers to trade (Clements.S, 2007).

Based on this the Government of Ethiopia (GoE) has received financing from the World Bank Group (WBG) for implementation of the National Quality Infrastructure (NQI) Development Project, and it intends to apply part of the fund to payments for goods, works, related services and consulting services to be procured under the Project. The Project's development objective is to improve the delivery of quality assurance services to enterprises in targeted sectors. The Project focused on three selected value chains; leather products, textile and garments products and agro-processed products.

Under Component 1, the project is designed to provide technical support to Strengthening Institutional Capacity of NQI institutions. This component will provide support to **IES, EAS, NMIE, and ECAE**. This intervention aims to build and strengthen the technical and human capital of the existing NQI institutions (Group, National Quality Infrastructure Development Project (P160279), 2016).

As defined by (Wideman, 2002) for a project to meet effectively its intended goals, there must be a way of doing things (needs to have a certain practice). It is generally accepted that there are certain project management practices which enhance the practice of managing. Those practices

are expected to be distinctive irrespective of the type of organization or project. The best practice is defined as “a strategy, approach, method, tool or technique that is particularly effective in helping an organization to achieve its objectives for managing a project” (Canada, 2023).

Therefore, this project work will try to assess the project management knowledge area practice during the implementation of the NQI projects to enhance the capacity of **IES, EAS, NMIE, and ECAE**. In addition, by analyzing the action that was taken by the NQI project, government and beneficiaries, the project work will interpret the effectiveness of the action and finally will recommend possible direction to the relevant organization.

1.3.Project work Question

Based on the statement of the problem the project work questions will be the following:

- Are the project management knowledge areas being practiced in in NQI Institutes Project expansion?
- What is the current project management practice in NQI Institutes Project expansion?
- Which project management practices need to be implemented and/or improved in the in NQI Institutes Project expansion?

1.4.Objectives of the project work

General Objective

The general objective of this study is to assess and analyze the project management practices of NQI institutes project expansion.

1.5.2 Specific Objectives

The study has the following specific objectives

1. To assess if project management knowledge areas were practiced in NQI Institutes Project expansion.
2. To identify the current project management practice in NQI Institutes Project expansion.
3. To pinpoint the gap in which the project management practices need to be improved in NQI Institutes Project expansion.

1.5. Significance of the project work

This project work is expected to be important in the following manners. Since there is no related study in this area with regard to the Ethiopian scenario, the study can be used as initial work to assess the project management practices of the NQI projects implementation under the fund of WBG for strengthen the national Quality Infrastructure Institutes in Ethiopia.

The study will help the project team and beneficiaries' institutes to be aware of the practices of the project management knowledge areas during project implementation which have a significant role to the success of the project. That is to attain the objectives of the project within planned schedule, under the estimated budget, by meeting the quality requirements of products and by reducing risk level.

Even though this study is carried out with a limited scope, it could be helpful to have an insight on the best and challenging issues on management projects. Since this will help in reviewing the current situation as well as for the effectiveness of similar projects in the same area. Moreover, the study will add values to understand the role of practicing project management knowledge area and applying them for project overall success.

As this study is only for academic purposes, it can contribute as inputs for further research in this area and can be used as reference for the academia, research and other related studies in the area of quality infrastructure implementation practices.

1.6.Scope and Limitations of the Study

The study focused mainly on the assessment of project management implementation practices of the NQI institutes project expansion with regard to the generally accepted project management knowledge areas defined by PMBOK, which will enhance the management of projects. those are Schedule Management, Scope Management, Cost Management, Quality Management, Risk Management, Resource Management, Communication Management, Procurement Management, Stakeholder Management and Integration Management. Because of time and budget constraints the scope of this study is limited to the project practices only with regard to project management knowledge areas in the of the case the selected organization. The project work will focus only the four NQI institutions (IES, EAS, NMIE, and ECAE.) with regard to the project expansion.

1.7.Organization of the study

The study is ordered into five chapters. The first chapter provides a brief background to the study, discusses statement of the problem, the research question, objective of the study, scope and limitation and significance of the study. The second chapter is about literature review on related articles which will strengthen the purpose of this project work, the third chapter presents about the methodology in which the research methods, data collection, the sources of data and the methods of data analysis, in the fourth chapter focus on the presentation, analysis and interpretation of the research findings. was analyzed and interpretation and the last fifth chapter stresses on the conclusion and recommendation based on the research findings.

1.8.Definition of key terms

- **Quality:** a set of inherent characteristics of an object fulfils requirements
- **National Quality infrastructure:** is the institutional framework that establishes and implements the practice of standardization, including conformity assessment services, metrology, and accreditation
- **Technical Barriers to trade:** Technical barriers to trade, a category of nontariff barriers to trade, are the widely divergent measures that countries use to regulate markets, protect their consumers, or preserve their natural resources, but they also can be used to discriminate against imports in order to protect domestic industries.

CHAPTER TWO

2. LITRETURE REVIEW

Theoretical Review

2.1.Introduction

This chapter covers theoretical and empirical review of literatures regarding the practices of project implementation based on previous study that have a similarity with this study, used to discuss and analyze the results in the area of NQI.

Well-developed countries depend on different regulations, standards and conformity bodies for their local and international market activities. If a developing country wishes to enter the international market, they must able to rely on international accepted standards, like access to testing facilities, metrology, conformity assessment organization, standards and accreditation. These are the main components a National Quality Infrastructure. The components of NQI are essential to trade, and they are closely related to one each other (Clements.S, 2007).

Developing countries like Ethiopia shall keep in mind a quality infrastructure that the key issues in which foreign investors will consider (Maskus, 2005).

When we talk about a national quality infrastructure, the system has to confirm access to international accepted standards and other technical regulations, that allow international accepted accreditation of their inspection and testing results as well certification facilities (Clements.S, 2007).

With this point in mind the government of the Federal Democratic Republic of Ethiopian have received a loan from the world bank group in order to strength the capacity of the existing NQI institutes. Since the project is active in the last five years with different implementation phases. This paper will assess the implementation practices of the project focusing on the NQI institutes.

Even though there is a limited paper published regarding the NQI practices in Ethiopia, this study will review the general practices in project implementation area that makes common with this project and will look at the practices of other countries.

2.2.Project

Different authors and institutions define the concept project in different ways. According to the project management institute (PMI) a project is “a temporary endeavor undertaken to create a unique product, service, or a result.” A project can be small or can be large. Both projects have a common characteristic they possess. These are, both have a well-defined objective, have specified start and finish dates, are designed and implemented to produce specific results, require financial material and human resources, involve one or more individual or groups, are unique (i.e., they will not be repeated precisely in the same way in the future) and, have definite location and target group (beneficiaries) (Project Management Institute, 2017).

2.2.1. Project characteristics

Projects whether small/large; or simple/complex, based in nature do have different characteristics. The below points explain the different characteristics of a project:

Uniqueness: -Unique product /goods and services/, Unique context, Unique process

Duration: - Temporary and limited timeframe

Numerous constraints: Quality, Time, Costs, Scope

Project life cycle: -They emerge from need/demand/resource and finish with the delivery of a satisfactory product or service

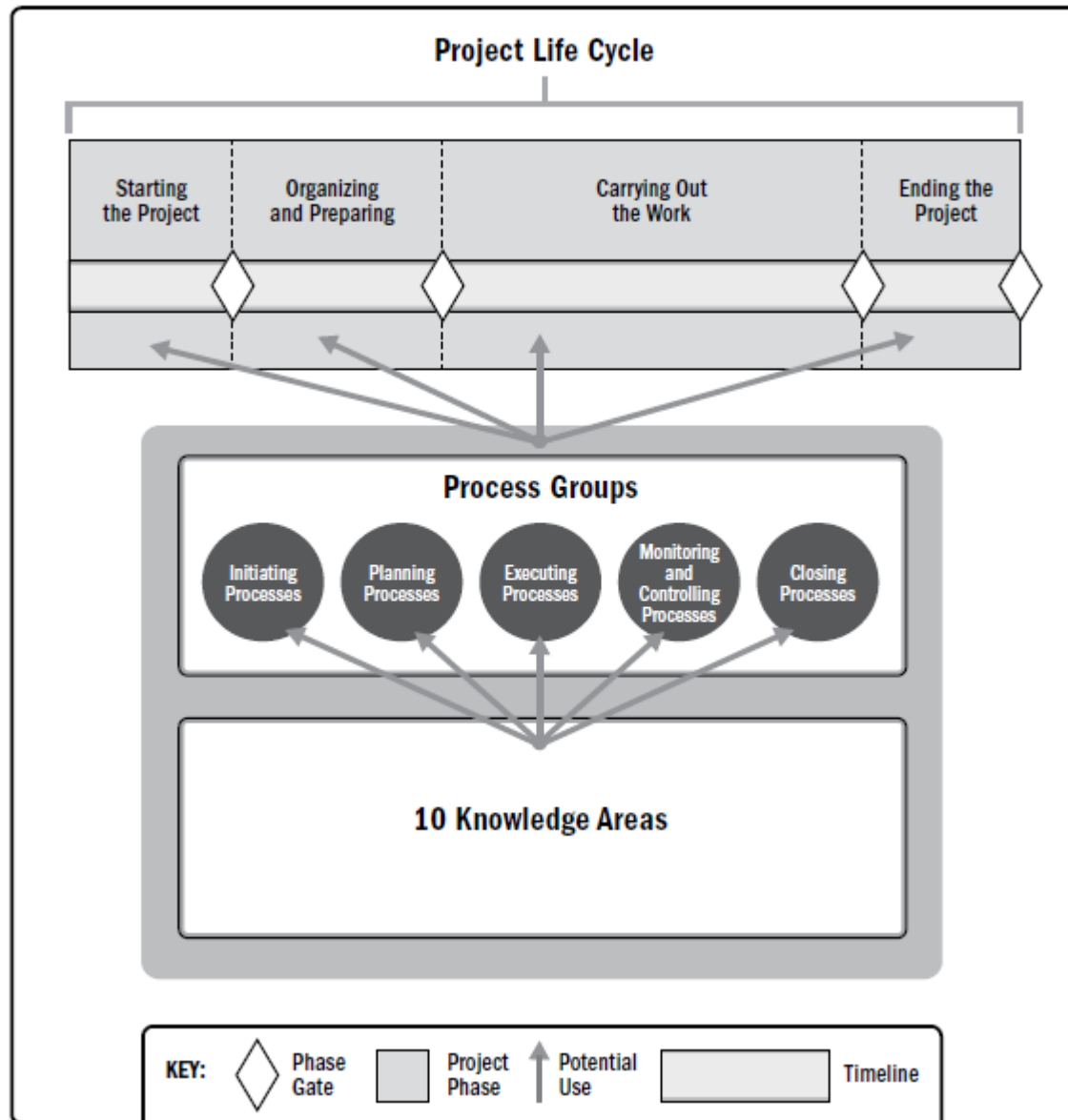
Involvement of stakeholders: - Different interest, Different fields, Different organizations, different culture

Context of relative uncertainty: - Environmental uncertainty [complexity, unpredictability], Technological uncertainty [size,], Resources uncertainty, number, complexity]

2.2.2. Project Cycle: Phases and Stages

The project life cycle comprises five interlinked stages through which a project passes in its life which in turn are grouped in to four major phases as presented in the following figure. The of project management processes nature is based on the incorporation of different processes and the objectives of each process that must be met for the success of the project.

Figure 1 Project life Cycle (phases)



(Source, Adopted from PMBOK 6th edition, PMI 2017)

It is critical to the management to give high emphases to all the phases, the implementation phase often equated with the efficiency with which this activity has been carried out. As more information is gathered during the various phases, the project is modified and reshaped, with consequent changes in its activities, outputs, cost estimates, implementation schedule, and so on. The process may also identify additional projects that overlap and interlock with the initial proposal. Each phase is logically separated from the next by a decision point. At each decision

point the project can be dropped, forwarded to the next phase, or recycled back to the previous one for restructuring and refining (PMBOK, 2017). Theoretical review project implementation is discussed as below.

2.3.Project Management Practices

The PMBOK published by PMI is the most and widely used guidelines in the area of project management. The PMBOK encompasses different knowledge areas and practices that are generally accepted and internationally recognized standard in the project management areas in a different discipline. Generally accepted means that the knowledge and practices are applicable to most projects. But it doesn't mean that the knowledge and practices described should be applied uniformly on all projects (Liviu, 2010). The Project Management Institute (PMI) has identified different knowledge areas that are important for successful project management. These knowledge areas described are:

2.3.1. Project Integration Management:

This knowledge area involves coordinating all the different aspects of a project, including its scope, schedule, budget, and resources. Project Integration management contains the forms and exercises to distinguish, characterize, combine, bind together, and facilitate the different forms and project administration exercises inside the Extend Administration Process Groups. Within the project administration setting, integration incorporates characteristics of unification, combination, communication, and interrelationship. These activities ought to be connected from the begin of the project through completion. Project Integration Administration incorporates making choices around: Asset assignment, adjusting competing requests, analyzing any alternative approaches, Fitting the forms to meet the project goals, and overseeing the interdependencies among the Project Administration Knowledge areas.

The Project Integration Management processes are:

- *Develop Project Charter:* -The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

- *Develop Project Management Plan:* -The process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.
- *Direct and Manage Project Work:* -The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
- *Manage Project Knowledge:* -The process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.
- *Monitor and Control Project Work:* -The process of tracking, reviewing, and reporting overall progress to meet the performance objectives defined in the project management plan.
- *Perform Integrated Change Control:* - The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating the decisions.
 - *Close Project or Phase:* - The process of finalizing all activities for the project, phase, or contract (Project Management Institute, 2017).

2.3.2. Project Scope Management: This knowledge area involves defining and managing the project's scope, including its deliverables, requirements, and objectives.

Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.

The Project Scope Management processes are:

- *Plan Scope Management:* -The process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled.
- *Collect Requirements:* - The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.
- *Define Scope:* - The process of developing a detailed description of the project and product.

- Create WBS: -The process of subdividing project deliverables and project work into smaller, more manageable components.
- Validate Scope: - The process of formalizing acceptance of the completed project deliverables.
- Control Scope: - The process of monitoring the status of the project and product scope and managing changes to the scope baseline (Project Management Institute, 2017).

2.3.3. Project Schedule Management:

This knowledge area involves developing and managing the project schedule, including its activities, milestones, and dependencies. Project Schedule Management includes the processes required to manage the timely completion of the project. The Project Schedule Management processes are:

- Plan Schedule Management: -The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.
- Define Activities: -The process of identifying and documenting the specific actions to be performed to produce the project deliverables.
- Sequence Activities: - The process of identifying and documenting relationships among the project activities.
- Estimate Activity Durations: -The process of estimating the number of work periods needed to complete individual activities with the estimated resources.
- Develop Schedule: - The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling.
- Control Schedule: - The process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline (Project Management Institute, 2017).

2.3.4. Project Cost Management:

Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. The Project Cost Management processes are:

- Plan Cost Management: - The process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled.
- Estimate Costs: - The process of developing an approximation of the monetary resources needed to complete project work.
- Determine Budget: - The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.
- Control Costs: - The process of monitoring the status of the project to update the project costs and manage changes to the cost baseline (Project Management Institute, 2017).

2.3.5. Project Quality Management:

This knowledge area includes ensuring that the project meets the quality standards and requirements set by the stakeholders. Project Quality Management includes the processes for integrating the organization's quality policy with regard planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives. Project Quality Management also supports continuous process improvement activities as undertaken on behalf of the performing organization.

The Project Quality Management processes are:

- Plan Quality Management: - identifying quality requirements standards for the project and its deliverables, and documenting how the project will demonstrate compliance with quality requirements standards.
- Manage Quality: - translating the quality management plan into practicable quality activities that incorporate the organization's quality policies into the project.
- Control Quality: - monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations (Project Management Institute, 2017).

2.3.6. Project Resource Management:

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help ensure that the right resources will be available to the project manager and project team at the right time and place.

The Project Resource Management processes are:

- Plan Resource Management: -The process of defining how to estimate, acquire, manage, and utilize physical and team resources.
- Estimate Activity Resources: -The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.
- Acquire Resources: -The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.
- Develop Team: - The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.
- Manage Team: -The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.
- Control Resources: - The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual use of resources, and performing corrective action as necessary (Project Management Institute, 2017).

2.3.7. Project Communications Management:

Project Communications Management involves the processes and activities required to plan, manage, and control the flow of information within a project. It includes the development of a communications management plan, which outlines how the project team will communicate with stakeholders, as well as the implementation of the plan through various communication activities. The first part of Project Communications Management involves developing a communications strategy that takes into account the communication needs of the stakeholders, the available communication channels, and the project goals and objectives. The communications management plan outlines how the project team will communicate with

stakeholders, including the types of information to be communicated, the frequency of communication, and the methods or channels of communication. The second part of Project Communications Management involves implementing the communication plan through various communication activities. This may include meetings, status reports, progress updates, presentations, and other types of communication. The project manager is responsible for ensuring that the communication activities are carried out effectively and that the stakeholders are kept informed of project progress and any issues or risks that may arise. Effective communication is essential to project success, as it helps ensure that all stakeholders are aligned and working towards the same goals. Effective communication also helps build trust and credibility with stakeholders, which can be critical to the success of the project. Therefore, project managers must understand the communication needs of stakeholders and develop a communication plan that is tailored to meet those needs (Project Management Institute, 2017).

2.3.8. Project Risk Management:

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, in order to optimize the chances of project success.

The Project Risk Management processes are:

- Plan Risk Management: - The process of defining how to conduct risk management activities for a project.
- Identify Risks: - The process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics.
- Perform Qualitative Risk Analysis: - The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.
- Perform Quantitative Risk Analysis: - The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.

- Plan Risk Responses: - The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.
- Implement Risk Responses: - The process of implementing agreed-upon risk response plans.
- Monitor Risks: The process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project (Project Management Institute, 2017).

2.3.9. Project Procurement Management:

Project Procurement Management is one of the ten knowledge areas of project management, as defined by the Project Management Institute (PMI). It involves the processes and activities necessary to acquire goods and services from external vendors or suppliers to support project execution.

The procurement process involves identifying the goods and services needed, selecting potential suppliers, negotiating contracts, and managing the ongoing relationship with suppliers to ensure that they meet the project's needs. The project manager is responsible for overseeing the procurement process, including identifying the procurement needs, developing procurement documents, and managing the procurement process.

In addition to managing the procurement process, the project manager is also responsible for ensuring that the procurement activities align with the project's overall objectives, including budget, scope, and schedule. Effective project procurement management involves selecting the most appropriate suppliers, ensuring that they deliver high-quality goods and services on time and within budget, and managing any risks associated with the procurement process.

Project Procurement Management processes include the following:

- Plan Procurement Management: documenting project procurement decisions, specifying the approach, and identifying potential sellers.
- Conduct Procurements: obtaining seller responses, selecting a seller, and awarding a contract.

- Control Procurements: managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts.

2.3.10. Project Stakeholder Management:

Project Stakeholder Management, which is another knowledge area in project management as defined by PMI. Stakeholder management involves identifying all stakeholders who have an interest or may be affected by the project, analyzing their needs and expectations, and developing appropriate strategies to engage with them throughout the project lifecycle. The stakeholders may include project sponsors, customers, team members, suppliers, government agencies, and the general public. Effective stakeholder management is critical to project success, as it helps ensure that the project meets the needs and expectations of all stakeholders. It involves developing communication plans, managing stakeholder expectations, and addressing any concerns or issues that may arise during the project. The stakeholder management process includes four main steps: identification, analysis, planning, and engagement. In the identification phase, stakeholders are identified and documented. In the analysis phase, their interests, expectations, and potential impact on the project are analyzed. In the planning phase, strategies for managing stakeholders are developed, and in the engagement phase, stakeholders are actively engaged throughout the project lifecycle. Overall, Project Stakeholder Management is about building positive relationships with stakeholders, understanding their needs, and working collaboratively to achieve project objectives.

The Project Stakeholder Management processes are:

- Identify Stakeholders: - identifying project stakeholders frequently and analyzing and recording relevant information concerning their interests, participation, interdependencies, inspiration, and potential impact on project success.
- Plan Stakeholder Engagement: developing approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project.
- Manage Stakeholder Engagement: communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement.

- Monitor Stakeholder Engagement: - monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through the modification of engagement strategies and plans (Project Management Institute, 2017).

Table 1 Project Management Process Group and Knowledge Area Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

(Source, PMBOK 6th edition, 2017)

These knowledge areas are interrelated and must be managed in an integrated way to ensure project success. Effective project management involves applying best practices and tools from

each knowledge area to achieve project objectives on time, within budget, and to the satisfaction of stakeholders.

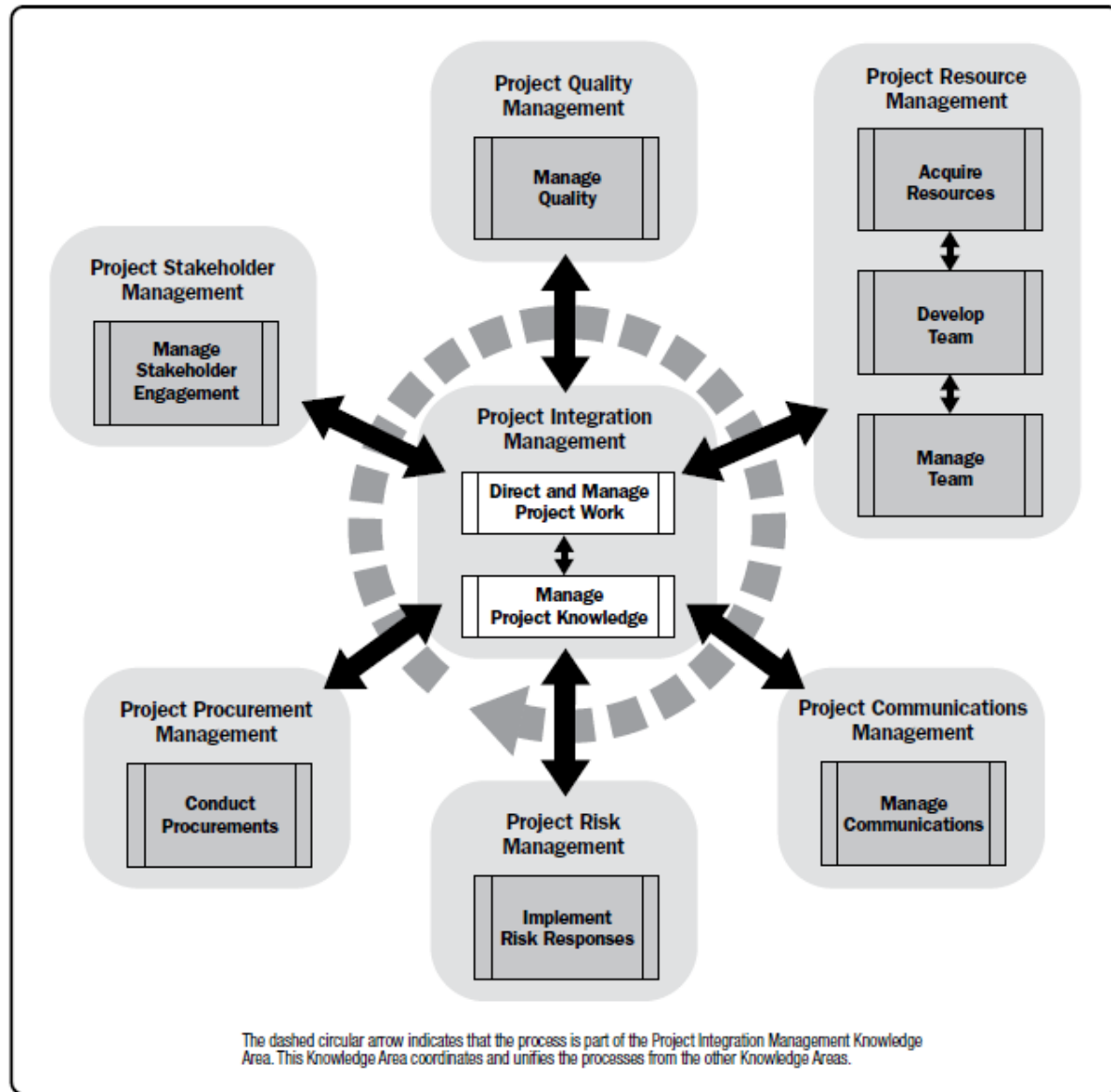
2.4.Characteristics of project implementation

Implementation is a stage where the earlier designs, plans, assumptions, projections, etc. are tested in reality. It concerns with the execution of the project, by drawing on the resources provided in the financing agreement to achieve the desired results and purpose of the project. Implementation means grouping of different activities aimed to bring activity into practical action (Fixsen, 2005).

In this phase various works are accomplished, like that of forming project implementation unit (organization), preparation of detail implementation (action) plan, setting up of M & E system, etc. Different reports are also produced at this stage; - inception report or plan of operations, annual working plans, progress reports, monitoring reports and the like. This phase needs the time, resource, effort and also required different management tools into an everyday operation (Schwalbe, 2017).

The implementation process consists of those processes performed to complete the work defined in the project management plan to satisfy the project requirements. This Process involves coordinating different resources, managing stakeholder engagement, and integrating and performing the activities of the project in accordance with the project management plan. In this project implementation stages the objectives and all of the project plans will turn in to reality. Most of the different resources required to the project cycle are assigned to this stage, and also practically most projects fail at the stage of implementation. therefore, project implementation is a serious component of the project life process (PMBOK, 2017).

Figure 2 Executing Process Group



(Source, Adopted from PMBOK 6th edition, PMI 2017)

Based on this the main objective of this study is to assess the NQI project implementation practice, a case study on NQI institutes.

2.5.Importance of effective implementation of NQI project

It was written by Yunsong WANG that the China National Quality Infrastructure System was organized, at the national-level which includes the National Institute of Metrology (NIM), the China National Institute of Standardization (CNIS), the China National Accreditation Service for

Conformity Assessment (CNAS), China Quality Certification Center (CQC) and also at the local level, the local governments have established metrology, standards, inspection and testing institutions to provide quality support for local economic and industrial development. As a result of the implementation of the China NQI system through the reform the following outcomes have been observed (Jean-Louis, 2011).

- The standard system is shifted from single government supply to government-organization-enterprise multi-supply.
- Strictly limits the scope of government-led standards, supports the development of social organization standard, etc,
- Dynamic catalog management was strictly implemented, and the CCC certification catalog was revised.
- The scope of implementation of the “self-declaration” evaluation method continued to expand.
- The market-oriented reform of inspection and testing institutions was promoted.
- The certification process was optimized and the time for administrative approval was reduced.
- The construction of a comprehensive information service platform for NQI was launched.
- Pilot projects of "One-stop" service (comprehensive quality infrastructure service) were launched in 10 cities.
- The product safety recall management system is improved (WANG, 2019).

With the assistance of the British Standard Institutes (BSI) the Egypt's quality infrastructure system had been reformed within three years of intervention and as a result, Egypt is now a signatory to ILAC and the Egyptian National Institute of Standards (NIS) had been strengthened with its technical and institutional capability.

Meanwhile:

- Technical barriers to global trade are reduced
- There are only fewer duplicated tests and accreditations, so the costs of global trade are reduced
- Products and services become globally competitive

- Egypt's can easily represent its views more effectively in international trade scenario. The net result is greater participation in global trade and a stronger balance of expenditures (BSI, 2018).

2.6.Components of NQI Project implementation process

It is well obvious that the different components QI need to be closely interrelated and without all of them being actively integrated and internationally recognized it cannot be reliably implemented. Since standards provide a framework or act as a common technical language between customers and suppliers and this will facilitate international trade and makes easy the transfer of technology. This gives market participants a uniform basis for assessing product quality and for goods to be labeled accordingly. Standardization promotes the rapid spread of technical knowledge and thus helps to make enterprises, particularly small and medium-sized, more competitive and innovative (Dranove, 2010).

2.7.Empirical literature review

Researchers have undertaken different assessment with regard to NQI in different countries like USA, EU and Asian country like Japan, South Korea, China and India. However, no study on this project has been done in case of Ethiopia. To effectively implement the NQI there must have the necessary resources and level of expertise, as well as a defined strategy based on the project scope, and ensure that the inherent risks are managed to safeguard the business from failure. If the contract is signed, the provider (vendor) should have a precise execution strategy, as well as sufficient skills on the area and also should have service plan (Nguyen, 2007).

International product standard, inspection and certification is more crucial, especially for exporters. This will support them to meet the global quality requirements, as they working within value chains in which they have to assure the quality of the products and services they are delivering. A developed markets like, European Union, United States, and Asia, are the major destinations of Ethiopian manufacturing products, where high product quality and practices are requested compared to the domestic markets (Guasch, 2007).

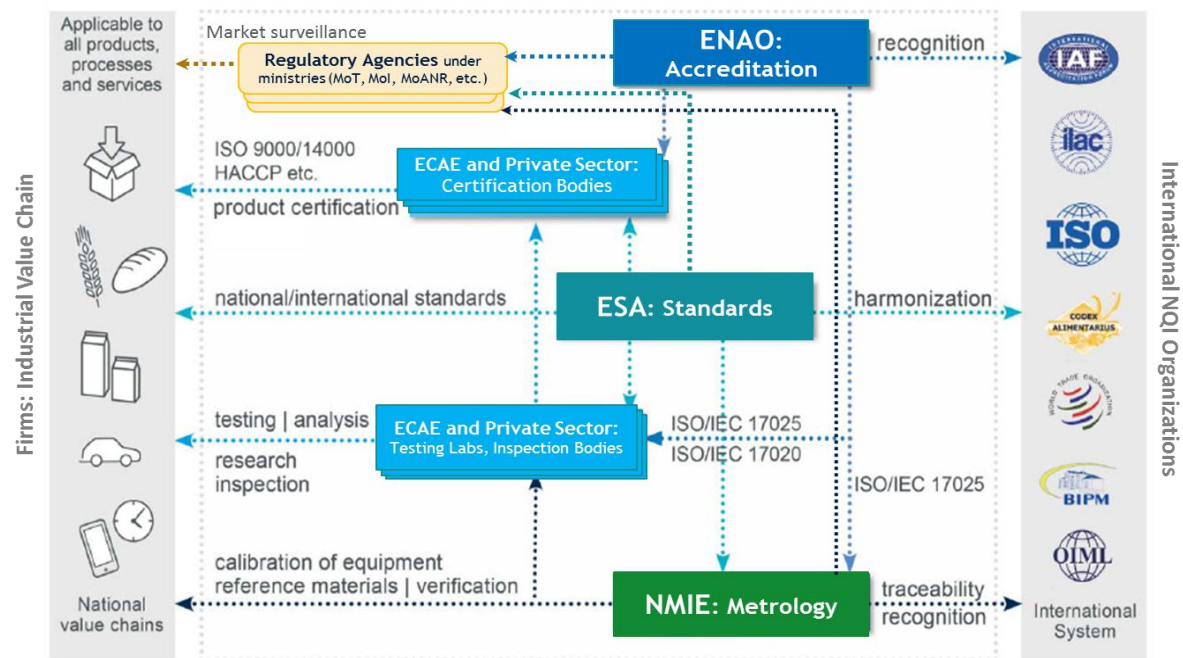
To check the conformance of locally produced or imported materials a quality functional system is very important. So far, one of the bottle necks to Ethiopian manufacturing firms that produce goods in meeting the quality requirements of the international markets is the lack or the inadequate capacity of NQI.

Basic elements of the NQI system have been put in place in Ethiopia. Under the reform undertaken in 2011, the former Quality and Standards Authority of Ethiopia was divided into four legally autonomous NQI institutions, responsible for providing quality assurance services in the fields of standards, accreditation, metrology, and conformity assessment (testing, inspection, and certification) to ensure good governance, create institutions free from conflicts of interest and be aligned with the international practice. The Ministry of Science and Technology (MoST) is the responsible ministry for NQI service development in the country and is responsible for the oversight of the four existing NQI service providing institutions.

- i. Ethiopian Standards Agency (ESA) in charge of adoption and dissemination of national, international, and company specific standards;
- ii. Ethiopian National Accreditation Office (ENAO), responsible for issuing accreditation of technical competency of laboratories and conformity assessment bodies;
- iii. National Metrology Institute of Ethiopia (NMIE) providing calibration services for laboratories to assure measuring equipment meets standards; and
- iv. Ethiopian Conformity Assessment Enterprise (ECAE) - a state owned enterprise providing testing, certification, or inspection services for products/services – to be complemented by private service providers (Group, Ethiopia National quality Infrastructure Development Project, 2016).

The relationships of the Ethiopian NQI institutes look like as below figure.

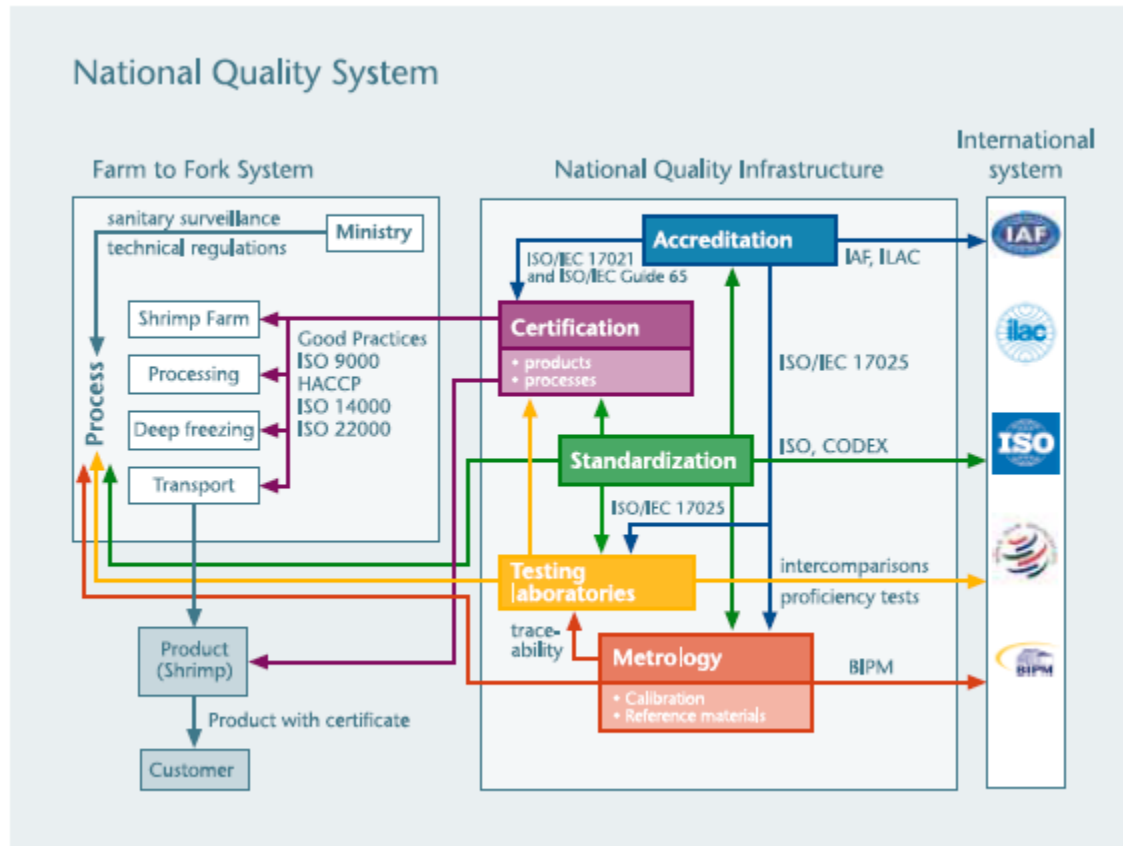
Figure 3 Relationships among Elements of the NQI



(Source, World Bank 2016)

The National Quality Infrastructure can be considered competent only if it has developed and can provide the required services. When these are not directly available in the country because of, for instance, lack of resources or of a critical mass to justify development, the QI gives the necessary support to local consumers by means of regional networks, outsourcing or facilitation.

Figure 4 Quality Infrastructure application to a productive chain



(Source, *The answer to global Challenge to NQI*, Dr Clements)

Based on these points when we see the empirical literature review with related to project management implementation practices regarding the knowledge area (Karani, 2007) conducted a study focusing on issues that impact the success of projects. In his study he identified the main factors as delayed payment to vendors, cash flow problems, underestimation of project duration, competence issues of staff on the project team, inadequate administration of work, and unlimited scope of works. He added that these inputs and transformational process factors are attributable to the core stakeholders in any project.

Taylor, (2006) claims that organizations are now being more sensitive about the staffs to choose, and they started to ensure that these people have the requisite skills, training, and with regard to the project. He recommends that a project manager must have a strong, dynamic, and continuous interest in coaching, training, and developing his subordinates.

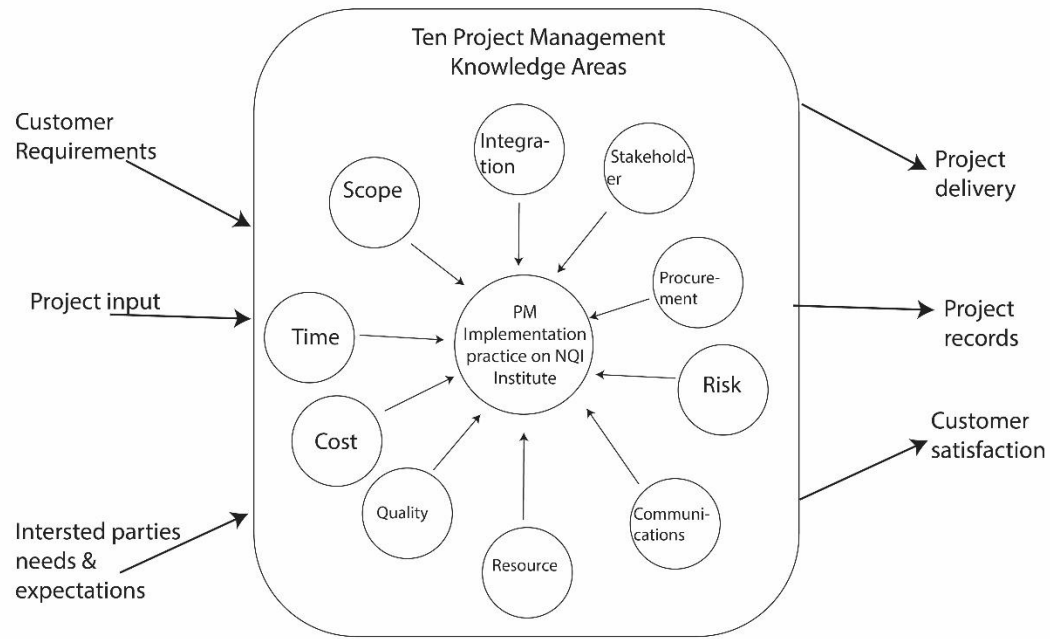
(Kum, 2014) conducted a study on the impact of training on employee and organizational performance. The study found that training improves employee performance, behavior, confidence, and motivation, and reduces turnover costs. Training also improves project implementation by increasing the quality of products produced by employees and reducing mistakes and defects. Effective communication is also critical for successful project implementation. According to the PMI's Project Management Body of Knowledge (PMBOK), Project Communications Management involves the processes and activities required to plan, manage, and control the flow of information within a project. The communication plan outlines how the project team will communicate with stakeholders, including the types of information to be communicated, the frequency of communication, and the methods or channels of communication.

In summary, the empirical literature review related to project management implementation practices highlights the importance of addressing various factors that can impact project delivery reliability, selecting project managers with the right skills and experience, providing adequate training to employees, and ensuring effective communication with all stakeholders. These factors are critical to ensuring project success and achieving project objectives.

2.8. Conceptual framework for assessing the practice of project management

According to (Svinicki, 2010), a conceptual framework is a collection of interconnected ideas or theories about how a specific phenomenon works or is related to its sections, and it serves as the foundation for understanding the causal or correlational patterns of interconnections through events, ideas, observations, principles, information, perceptions, and other aspects of experience. A conceptual framework is a visual or written output that visually or narratively depicts the principal elements to be investigated, the important causes, definitions, or variables, and the assumed relationships between them (Miles, 1994). The proposed framework for this research is illustrated in the figure 5 below.

Figure 5 Conceptual framework of this study (developed by researcher,2023)



CHAPTER THREE

3. METHODOLOGY

3.1.Introduction

This chapter presents the phases of the activities to be followed in conducting this study. To study the project topic and come to a conclusion, the chapter describes the methodologies used in order to address the research questioners. The goal is to define the research approach, design, the population, sample size and techniques, the data source, collection procedures and the methods to be used to analysis in order to meet the study's objectives and to answer the research questions.

3.2.Research Design and Approach

As mentioned by (Zikmund, 2003) the research design described as “a master plan that specifies the methods and procedures for collecting and analyzing needed information”. The function of research design is to allow for the collection of relevant evidence with the least amount of effort, time, and money (Kothari C. , 2004). It is important to undertake an adequate research design for the given issue to answer the research questions. The type of research design that will be used is a descriptive type, a qualitative approach is selected which is concerned with making interpretation based on perspective.

This research work is going to be done by collecting primary data from relevant technical experts, team leaders, managers, consultants and stakeholders. In addition, relevant documents that could give an information related to the practice of project management will be used. Secondary were used from related journals, articles, books and other project publications.

For the analysis of the assessment of NQI project expansion implementation, utilizing both primary and secondary data will be acquired from the NQI institutes. The collected primary and secondary data will be summarized mostly through charts and tables, but other acceptable statistical tools will be employed as well.

3.3.Population and Sampling Technique and sample size

The target population for the research is the NQI institutes that was supported by World bank under the NQI project. The NQI institutes are four in number and those are ECAE, IES, EAS and NMIE. The study population of this research includes the management members of ECAE, EAS, ISA, NMIE, NQI PIU department and those technical experts, team leaders, managers consultants and stakeholders who have a directly involvement in the project. The study focuses on the evaluation of the practices of project management knowledge areas implementation of NQI institutes.

As per the explanation of (Kothari C. , 2004) the number of objects chosen from the universe to make up a sample is referred to as the sample size. In order to represent the target population an appropriate sample size must be used. This study follows a purposive sampling technique and will help to get participants having an information about the project, so they can give a reliable information that helps to address the objective of the study. The questionnaire was distributed for 30 participants and 28 of them filled the questionnaire which was manageable size. The study is going to be based on the analysis of both primary and secondary data. As the primary source of data, the study used semi structured interview and close ended questionnaire which helped in answering questions related to the study objectives. As a secondary data source: articles, related books, journals, publication from the project office and other online information were reviewed.

The primary data were collected from selected team leader, manager and stakeholders' interview, and also from the questioners collected in google form and hard copy.

3.4.Method of Data collection and Analysis

In order to achieve the objective of this research, both primary and secondary sources of data were used. The instruments engaged in order to collect primary data, semi- structured interview with selected participants and questionnaires were designed focusing on the effectiveness of project management practices, the semi-structured interview provides an opportunity to gather in-depth information from key project personnel, while the questionnaire can be used to gather data from a larger group of stakeholders. The questions in the interview and questionnaire were designed to focus on the effectiveness of project management practices and benchmarking the ten knowledge areas defined by PMBOK, as well as incorporating relevant findings from the related literature review.

In addition, secondary data were collected through reviewing related books, articles, journals, and publications from the project office and other sources by deeper understanding of the project management practices being undertaken. Overall, the use of both primary and secondary sources of data provided a more comprehensive understanding of the project management practices being studied and help to identify areas for improvement.

The closed-ended questions were used to assess the implementation practices of the project and related issues in the area of knowledge areas in project management such as, scope, risk, cost, communication, stakeholders, quality, management etc. on both hard copy and Web based questionnaire that was distributed to selected participants. Likert scale rated from 5 points were used to structure the questionnaire, in which 5 representing strongly agree, 4 agree, 3 neutral, 2 disagree, and 1 strongly disagreeing.

The collected data were analyzed using both quantitative and qualitative methods. Quantitative analysis of the data collected through the questionnaire were used to identify the patterns and trends in the data, as well as to provide statistical evidence to support the research findings. As a descriptive nature of the result was analyzed by using the average mean and standard deviation. Qualitative analysis of the data collected through the semi-structured interview were provided a deeper understanding of the project management practices being studied, as well as identify common themes and concepts. Since qualitative analysis involved analyzing the responses to the interview questions using sentences and phrases, and bringing the common ideas and concepts of the responses together into a common understanding.

3.5.Validity and Reliability of the instruments

Validity and reliability are important ways by which any study is assessed before being started to the field for data collection.

3.5.1. Validity and reliability

The researcher considered the reliability and validity of the research. The Validity of the data collecting tools were done by the consultations with the advisor. The questionnaires were reviewed and feedback was given by the advisor before collecting the data. The researcher ensures that the instruments used to collect data contained all the information that answers the set questions and address the study objectives. The questionnaires were made in detailed in order to cover all the issues going to be measured. The questionnaire was reviewed in response to the comment given, and the final version was validated.

The researcher used the instruments using credible sources published papers by referring to the sources to ensure the quality and reliability of the data used in this analysis. The questionnaires

reliability was checked by the Cronbach's alpha test coefficient using SPSS 27 software.(Refer Annex3)

3.6.Ethical Issues

The study preserves the ethical consideration of the university rules during developing, collecting and analyzing data. The participants were informed about the aim of the study and their agreement was obtained prior to sending them the questionnaire. Anonymity of the identity of the participant's was maintained throughout the study. All references used throughout the paper are cited and acknowledged. The information gathered in study was only for the purpose of academic study.

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1.Introduction

This chapter deals with the analysis, presentation and interpretation of data on the main objective of the research work on project implementation practices at the NQI institutes, that was collected from relevant stakeholders. The practices are related to project management implementation knowledge, like schedule management, cost management, quality management, scope management, resource management, risk management, communication management, integration management, procurement management, senior staffs support management, and stakeholders' management areas. The chapter summarizes the data that was collected from respondents using hard copy and google form questionnaires. The questionnaires were developed using a five scales Linkert form from one to five, were 5 representing strongly agree, 4 represents agree, 3 uncertain, 2 represents disagree, and 1 strongly disagree, and respondents replied their knowledge and practices in the area of NQI project implementation. SPSS statistics was used to evaluate the data obtained using mean and standard deviation. The summary of the analysis with their presentation and interpretation discussed as below.

4.2.Response Rate

The sample size that was determined for this study was 30. Hence, from the total of 30 questionnaires sent to relevant respondents (experts, team leader, project manager and consultants) in the area of NQI project implementation 28 questionnaires were filled appropriately and returned, it covers 93.3% of the expected respondents, so it is taken as suitable for analysis.

4.3.Respondents Demographic Information

The first part of the questionnaire is about the general profile like, age, gender, qualification, experience in the area of NQI, their position and working department (areas) of the respondents who participated in the project.

The respondents were requested to fill their gender as either male or female and their age's. The results from the respondents are as shown in below table 2.

Table 2 Biographical Information (Gender and Age)

		Frequency	%	Total
Gender	Male	25	89	28
	Female	3	11	
Age	<30	0	0	
	30-40	10	36	
	40-50	15	54	
	>50	3	10	

(Source: field survey,2023)

From the total of 28 respondents participated in the study, 25(89%) were male and only 3(11%) were female. This indicates that majority of the participants belongs to this project are male.

The respondents also requested about their age and from the 28 respondents none of them are below 30 and 15 respondents age are between the age 40 and 50 which indicates the majority are in this range, the other 10 respondents are between 30 and 40 and the remaining 3 respondents are above 50. In general, this shows most of the respondents are in the good working age which will have the advantage to contribute their knowledge in project implementation.

As per the findings of the study, educational qualification of the majority respondents are master's degree 61 percent (17), 10 Percents of the respondents participated in the study are bachelor's degree. None of the participants had a diploma and one participant had a doctorate degree.

Table 3 Qualification of the respondents and their experience in NQI area

		Frequency	%	Total
Qualification	Diploma	0	0	28
	Degree BA/ Bsc	10	36	
	Master MA/Msc	17	61	
	PhD	1	4	
Experience in the area of NQI	<3	0	0	28
	3-7	3	11	
	7-10	5	18	
	>10	20	71	

(Source: field survey,2023)

As indicated in the table 3 the experience of the majority (71%) participants had more than 10 years, and the remaining 18 percent had an experience in the area of the NQI for more than 7 years and below 10 years. Only 11 percent of the participants had an experience less than 7 years. As a result, with this qualification and year of experience, it is assumed that the respondents well qualified for the area of the study and understood and responded appropriately to the questionnaires disseminated in this study.

Table 4 Respondents position in the projects and their working areas

		Frequency	%	Total
Position in the project	Expert	11	39	28
	Team leader	8	29	
	Director	4	14	
	Consultant	5	18	
Working areas	Technical management	17	61	28
	Project management	6	21	
	Administration management	5	18	

(Source: field survey,2023)

With regard to the position and working area in the project implementation, 39% and 29% are experts and team leaders respectively. The others 14 % are director and 18% are consultants. 61% of the respondents participated as in the technical managements, the other 21% participated in project management and the remaining 18 % participated in the administration management. This shows that majority of the respondents have a matured experience as they are a team leader and consultants.

4.4.NQI Institutes project implementation practices

This part will discuss the information about project implementation techniques on national quality infrastructure projects at NQI institutes were presented, analyzed and interpreted based on the respondent's view how the different dimensions of the project management knowledge areas practiced using a Likert scale. The respondents select 5 when they agree strongly as per their perspective on the practices, 4 when they agree, 3 when they are uncertain in the area, 2 when they disagree with the implementation practices and they expressed their perspective by giving 1 when they strongly disagree on the ideas.

Authors like (Al Marashi, 2018) interpreted the Likert scale analysis as mean from 1 to 1.8 expressed as strongly disagreement, a mean from 1.81 to 2.60 used to expressed disagreement, mean from 2.61 to 3.4 used for uncertainty, a mean from 3.41. to 4.2 is used to expressed agreement and for expressing a strong agreement a mean from 4.21 to 5 will be used.

Likert Scale Interpretation

No	Range of Mean Values	Level of Project Management Practice
1	1.00 – 1.80	Very low
2	1.81 – 2.60	Low
3	2.61 – 3.40	Moderate
4	3.41 – 4.20	High
5	4.21 – 5.00	Very high

Therefore, the result of findings on the project practices from 28 respondents presented quantitatively as below.

4.4.1. The practice of Schedule Management

Table 5. summarize the data that was obtained from the respondents on the practices of project schedule management during implementation of NQI project.

Table 5 Schedule Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	The project schedule is maintained as planed initially	6	16	3	3	0	3.86	.932
2	Tools and technique like (CPM/PERT) are used effectively	2	7	13	6	0	3.18	.863
3	The duration for the activity's estimation is good	5	20	1	2	0	4.00	.720
4	Project implementation plan are well defined	6	16	2	4	0	3.82	.983
Over all mean		3.72						

(Source: field survey,2023)

Respondents in this study were requested to rate the project schedule set at the initial had been maintained. As demonstrated in the above table 5, the mean is 3.72 this indicates that most of the respondents agree that the initial project schedule was maintained.

Regarding the use of tools and scheduling for effective scheduling like CPM/PERT the average respondents mean is 3.18 this indicates there is difference in the respondents view and the average responses is towards uncertainty. This indicated the tools and techniques are not properly implementation though the project time. The responses were good for the questions

regarding estimation of duration, a mean with 4.0 which indicates that most respondents for this category is agree. Regarding the plan of project implementation mean of the response of most respondents is 3.82, this shows that the activities in the project management are planned well. The overall mean of the respondents indicates the project schedule management practice was good.

4.4.2. The practices of Scope Management

Table 6. summarize the data that was obtained from the respondents on the scope management practices during implementation of NQI project.

Table 6 Scope Management practices

No	Variable	5	4	3	2	1	Mean	STDEV
1	Detailed description of the project is developed	6	20	2	0	0	4.14	.525
2	Project activities was divided in to manageable components	8	16	2	2	0	4.07	.813
3	Project scope changes is managed appropriately	3	17	6	2	0	3.75	.752
4	Activity list and attributes is properly seated	2	18	6	2	0	3.71	.713
5	Stakeholder's requirements are properly collected	3	14	7	4	0	3.57	.879
Over all mean		3.85						

(Source: field survey,2023)

The participants asked regarding with the scope managements and their responses were indicated in table 6. With regard to the detailed description of the project is developed most participants agree with mean 4.14 with regard to Project activities was divided to manageable components and the scope changes of the project is appropriately managed most participants agree with mean of 4.07. The responses showed that

the participants agree mostly on the activity list and attributes is properly seated, and Stakeholder's requirements are properly collected with a mean of 3.57.

In general, the average responses with regard to the lists of the activities within the scope management practices was agree, which indicates that the project scope were managed properly with the overall mean of 3.85.

4.4.3. The practice of Cost Management

Table 7. summarize the data that was obtained from the respondents on the practices of cost management during implementation of NQI project.

Table 7 Cost Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Project cost is effectively estimated	1	16	6	4	1	3.43	.920
2	The Budget allocation is appropriate	2	18	5	3	0	3.68	.772
3	Project cost is being properly controlled	0	16	7	5	0	3.39	.832
4	Effective cost management tool is used	1	17	5	5	0	3.50	.839
5	By evaluating vendors/ suppliers cost efficiency of the project ensured	2	18	4	4	0	3.64	.826
Over all mean		3.53						

(Source: field survey,2023)

The following mean was recorded from the respondents respectively regarding the project cost management. Project cost is effectively estimated, mean 3.43, appropriateness of budget allocation mean 3.68, Project cost is being properly controlled mean 3.39, the mean 3.5 is for effective cost management tool is used and 3.64 efficiency of the project cost is ensured by

evaluating vendors/ suppliers. The result shows that most of the respondent's rate agree for the most activities with regard to cost management practices. However, with regard to project cost is being properly controlled the mean indicates that most respondents are uncertain.

The National Quality Infrastructure Project in Ethiopia was a multi-year project aimed at improving the quality of products and services in the country by developing and strengthening the national quality infrastructure. The project was funded by the World Bank, and it involved a significant investment of resources.

The information from the top management interview assured that a clear understanding of the project budget from the outset, and used a bottom-up approach to estimate costs for each work package. The budget was developed and approved with a consultation of by the project sponsor world Bank. In addition, they said that a contingency budget was developed to account for any unforeseen costs. The budget was communicated to all stakeholders, and regular updates was on cost performance."

The project was launched in 2016 and was expected to be completed by 2020. However, the project implementation period was extended until 2022/3 to allow for the completion of all the project activities. During the implementation period, the project faced several challenges, such as delays in procurement processes, capacity gaps, and institutional challenges.

According to the project documents and reports, it is clear that the final cost of the project exceeded the initial budget. However, the project reports indicate that the project was able to achieve its development objectives and make significant contributions to the improvement of the national quality infrastructure in Ethiopia.

4.4.4. The practices of Quality Management

Table 8. summarize the data that was obtained from the respondents on the practices of quality management during implementation.

Table 8 Quality Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Relevant quality standard is identified	6	20	0	1	1	4.04	.838
2	Quality plan is developed	4	22	0	2	0	4.00	.667
3	The quality planned is properly implemented	0	22	2	4	0	3.64	.731
4	Quality is being monitored/controlled for meeting specifications	4	16	4	4	0	3.71	.897
5	Quality is assured for each activity	1	14	10	2	0	3.46	.744
Over all mean		3.77						

(Source: field survey,2023)

As it can be seen from the table 8 almost all respondents agree with the activities regarding quality management. This indicates that relevant quality standard is identified, plan for quality is developed, the plan is implemented properly, quality is being monitored for meeting specifications and the quality is assured for each activity. As it was defined on ISO 9000:2015 Quality management System standard, “quality is degree to which a set of inherent characteristics of an object fulfils requirements”. In addition, the quality father like Juran define quality as Fitness for purpose / use and Crosby said Compliance with specified requirements. Therefore, from the point of view of the respondents most of the quality management activities met the requirements.

The interviewer mentioned that the National Quality Infrastructure Project in Ethiopia had several achievements in improving the quality of products and services in the country by developing and strengthening the national quality infrastructure. They also mentioned some of the specific achievements of the project these includes: Development of a National Quality Policy and Strategy: The project supported the development of a National Quality Policy and Strategy, which provides a framework for improving the quality of products and services in Ethiopia.

The project team said the quality of project activities was not compromised, since the project team implemented several measures throughout the project implementation period. Some of the measures taken include:

Quality Assurance: The project team implemented a quality assurance system that was designed to ensure that project activities were carried out in accordance with the project's quality standards. The quality assurance system involved regular monitoring and evaluation of project activities to ensure that they met the required quality standards.

Technical Assistance: The project team provided technical assistance to the implementing agencies to ensure that they had the necessary technical expertise to carry out project activities to the required standards.

Capacity Building: The project team implemented capacity building activities to ensure that project personnel had the necessary skills and knowledge to carry out project activities to the required standards.

Quality Control: The project team implemented a quality control system that was designed to ensure that project outputs met the required quality standards. The quality control system involved regular inspections and testing of project outputs to ensure that they met the required quality standards.

Compliance with International Standards: The project team ensured that project activities and outputs were compliant with international quality standards, such as ISO standards, to ensure that they met the required quality standards.

The National Quality Infrastructure Project in Ethiopia implemented several measures to ensure that the quality of project activities was not compromised. Any issues related to the quality of project deliverables were immediately addressed, and corrective actions were taken to ensure that the project outputs met the required quality standards. The project team ensured that project activities and outputs met the required quality standards by implementing quality assurance, technical assistance, capacity building, quality control, independent verification, and compliance with international standards.

The National Quality Infrastructure Project in Ethiopia was designed to improve the quality of products and services in Ethiopia by establishing a national quality infrastructure system. From the detail interview with the project implementation unit the National Quality infrastructure

Project in Ethiopia had several components and activities that aimed to achieve the goal. To mentioned some specific examples of how the project had improved the quality of products and services in Ethiopia:

Strengthening of Testing and Calibration Laboratories: The project supported the strengthening of testing and calibration laboratories in Ethiopia, which has improved the accuracy and reliability of testing and calibration services. This has helped to improve the quality of products such as food, textile, and other materials.

Strengthening of a National Metrology Institute: The project supported the strengthening of a National Metrology Institute, which is responsible for maintaining the national measurement standards and providing calibration services to industry.

Improvement of Testing and Calibration Laboratories: The project supported the improvement of testing and calibration laboratories in Ethiopia. This involved the renovation and upgrading of existing laboratories and the establishment of new ones.

Strengthening of Accreditation and Certification Bodies: The project supported the strengthening of accreditation and certification bodies in Ethiopia. This involved capacity building and the provision of technical assistance to these bodies to improve their performance.

Improved Quality of Products and Services: The project's activities had contributed to the improvement of the quality of products and services in Ethiopia. This has resulted in increased competitiveness of Ethiopian products in both domestic and international markets.

From the point of view of the interviewer the National Quality Infrastructure Project in Ethiopia had made significant contributions to the development of the national quality infrastructure in Ethiopia, which is essential for the country's economic growth and competitiveness.

4.4.5. The Practice of Risk Management

Table 9. summarize the data that was obtained from the respondents on the practices of project risk management during implementation of NQI project.

With this regard, the below table 9 shows us the overall mean score of the risk management practices is 3.35 and the range of the mean in the individual risk management activities are 3.29 and 3.50 which tends to uncertain. However, some of the respondents' responses on some risks actively are agree, which indicates the risk management were not managed properly.

Table 9 Risk Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Risk management is planned	2	12	8	4	2	3.29	1.049
2	Project risks are identified properly	2	16	6	2	2	3.50	1.000
3	The identified risks are analyzed	0	16	10	0	2	3.50	.638
4	Mitigation plan are prepared	0	16	10	2	0	3.50	.638
5	Risks are timely addressed	0	6	16	6	0	3.00	.667
6	Risks are monitored effectively	0	8	14	6	0	3.29	.460
Overall mean		3.35						

(Source: field survey,2023)

As the researcher saw from the documents of the project risk management is planned properly and projects risk are identified and analyzed. The main challenges are addressing the risk and monitoring their effectiveness. This shows that, the risks are planned, identified and analyzed, but it lacks to address and monitor it effectively.

The interview project team member mentioned in their interview that a risk management process that involved identifying potential risks, assessing their likelihood and impact, and developing risk mitigation strategies was developed. They said the risk management process was initiated at the beginning of the project and continued throughout the project's life-cycle.

The project team used various tools and techniques to identify potential risks, such as conducting risk assessments, consulting with stakeholders, and reviewing project plans and schedules. The identified risks were documented in a risk register, which was regularly updated and reviewed by the project team and the project steering committee.

The project team also developed risk mitigation strategies to address the identified risks. These strategies included contingency plans, risk transfer, risk sharing, and risk avoidance. The risk mitigation strategies were regularly reviewed and updated to ensure their effectiveness and relevance. In addition, they said the project team monitored the progress of project activities and

corrective actions were taken in a timely manner to mitigate these risks. In addition to interview the researcher overviewed the project documents and reports, several specific risks were identified and mitigated during the National Quality Infrastructure Project in Ethiopia. Some examples of these risks include:

Delayed Implementation: One of the identified risks was the potential for delays in project implementation due to various reasons such as administrative challenges, procurement delays, and changes in the political environment. To mitigate this risk, the project team developed a detailed project schedule that included clear timelines, dependencies, and contingency plans. The project team also closely monitored project progress and identified potential delays in a timely manner, which enabled them to take corrective actions to ensure that the project remained on track.

Limited Stakeholder Engagement: Another identified risk was the limited engagement of stakeholders in project activities, which could affect the project's success. To mitigate this risk, the project team developed a comprehensive stakeholder engagement plan that identified key stakeholders and their communication needs. The project team also conducted regular stakeholder engagement activities, such as workshops and meetings, to ensure that stakeholders were informed of project progress and had an opportunity to provide feedback.

Insufficient Technical Capacity: The project team identified the potential risk of insufficient technical capacity among project personnel and implementing agencies, which could affect the quality of project outputs. To mitigate this risk, the project team provided technical assistance and capacity building to project personnel and implementing agencies. This included training workshops, and mentoring programs, which helped to build the technical capacity of project personnel and implementing agencies.

Budget Overruns: The project team identified the potential risk of budget overruns due to changes in project requirements, price fluctuations, and other factors. To mitigate this risk, the project team developed a detailed project budget that included all project costs and developed a robust financial management system. The project team closely monitored actual expenditures against the budgeted amounts and implemented cost-saving measures where necessary.

Limited Coordination: The project team identified the potential risk of limited coordination among implementing agencies, which could lead to delays and affect the quality of project outputs. To mitigate this risk, the project team established an effective coordination mechanism

that involved regular meetings and workshops among implementing agencies. The project team also developed a clear reporting system that enabled implementing agencies to report on their progress and challenges.

Even if the interview output indicates the project team used various tools and techniques to identify potential risks, developed risk mitigation strategies, and monitored project progress, but the result of the closed ended questioner indicates as there is a limitation in addressing and monitoring the risk effectively.

4.4.6. The practices of Resource Management

Table 10. summarize the data that was obtained from the respondents on the practices of project resource management during implementation of NQI project.

Table 10 Resource Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Resource management is planned	2	18	2	6	0	3.57	.920
2	Resources for activities are properly estimated	2	20	4	2	0	3.79	.686
3	Allocated resources are used as planned	0	18	2	8	0	3.36	.911
4	Appropriate HR management tool is applied to motivate train and reward employees	0	14	8	6	0	3.29	.810
Over all mean		3.50						

(Source: field survey,2023)

Resource is the main inputs to the effectiveness of any project managements, accordingly the respondents' attitudes regarding the resource management practices was summarized in the table 10. According to respondents' responses the mean to resource management is planned is 3.57 and 3.79 is the mean to resources for activities are properly estimated. Which indicates that most respondents agree on those activities. With regard to the allocated resources are used as planned the mean is 3.36 in which the respondents are uncertain. This indicates that most respondents agree on the remaining activities of the resource management practices. When we sum up the

results, it is evident that almost all respondents agree and strongly agree on the three components of the risk management activities, but with regard to the activities appropriate HR management tool is applied to motivate train and reward employees most of the respondents replied their disagreement. Which indicates management tools to motivate, to trainee and to empower employees were not properly practiced.

From the discussion with the technical experts, team leaders and managers participated in the project there is a various mechanism that was set in the project document to train and reward employees for the success of a project, like capacity building, recognition and appreciation, performance evaluation and career development.

However, it was evident from the interview that the senior managers didn't properly used the various mechanisms to train and reward employees for the success of a project. In general, they believed that these mechanisms can help to build employee capacity, motivate employees, promote a positive work culture, and ensure that the project is progressing in the right direction.

4.4.7. The practices of Communication Management

Table 11. summarize the data that was obtained from the respondents on the practices of project communication management during implementation of NQI project.

Table 11 Communication Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Appropriate communication plan is developed	4	14	2	6	2	3.43	1.200
2	There is timely communication of project information	0	14	8	4	2	3.21	.957
3	Mechanism to deal with communication barrier is used	0	16	4	6	2	3.21	1.031
4	Project performance is reported regularly	6	16	2	4	0	3.86	.932
5	Effective mechanism for feedback is used	0	14	6	8	0	3.21	.876
6	Information is disseminated timely to stakeholders	0	14	8	6	0	3.29	.810
Over all mean		3.37						

(Source: field survey,2023)

The above table 11 shows the respondents attitude to the project communication management. According to the results of the respondents the mean for appropriate communication plan is developed is 3.43, which indicates most respondents agree on it.

The mean 3.21. is for three activities under this category that means timely communication of project information, mechanism to deal with communication barrier is used. This indicates also their agreement. The result of the respondents in table 11 with regard to mechanism to deal with communication barrier is used, project performance is reported regularly, effective mechanism for feedback is used, and Information is disseminated timely to stakeholders shows that most of the respondents uncertain on the communication management practice. When we summarized their opinion towards the communication practices of the project it indicates as it was moderate. There was appropriate communication plan is developed and Project performance is reported regularly. However, the uncertainty of some respondents' responses with regard Information was disseminated timely to stakeholders shows that, the mechanism for communication was not in place, this indicates information may not be disseminated to same stakeholders. In addition, most respondents are uncertain with mechanism to deal with communication barrier. The overall mean (3.37) also indicates the uncertainty towards the practices of communication.

From the interview point of view with the project team and selected stakeholders it was evidence that the roles and responsibilities of the team members and stakeholders was planned to ensure effective project implementation.

In addition to the interview output the project documents and reports indicates that, the roles and responsibilities of the project team and stakeholders were clearly communicated. The plan was shared with all stakeholders.

The project management team also conducted regular meetings and workshops to ensure that all team members and stakeholders were aware of their roles and responsibilities. The meetings provided an opportunity for the project team and stakeholders to discuss project activities, progress, and challenges, and to ensure that everyone was aligned with the project goals and objectives.

The communication strategy developed for the National Quality Infrastructure Project in Ethiopia was an essential tool for maintaining effective communication among the project team and stakeholders. This communication strategy included several elements that helped to ensure

effective communication throughout the project implementation period. Some of the ways in which the communication strategy helped to maintain effective communication include:

Communication Channels: The communication strategy identified the communication channels that would be used to facilitate communication among the project team and stakeholders. These channels included face-to-face meetings, email, phone calls, etc.

Methods of Communication: The communication strategy identified the methods of communication that would be used to communicate project information and updates. These methods included regular project reports, progress updates, etc.

Frequency of Communication: The communication strategy identified the frequency of communication that would be required to maintain effective communication among the project team and stakeholders. This included regular meetings and workshops, as well as periodic progress reports.

Feedback Mechanisms: The communication strategy provided feedback mechanisms that allowed stakeholders to provide feedback on project activities and updates. This included regular feedback sessions and surveys.

Even though, the communication strategy developed for the National Quality Infrastructure Project in Ethiopia helped to maintain effective communication among the project team and stakeholders, there is a limitation on implementing the strategy identified, like effectively usage of the communication channels, and on the frequency used to communicate project information and updates. Even same stakeholders didn't agree on their proper engagement, the project team emphasized that selected stakeholder was engaged and their feedback was incorporated into project activities and decisions.

4.4.8. The practices of procurement Management

Table 12. summarize the data that was obtained from the respondents on the practices of project procurement management during implementation of NQI project.

Table 12 Procurement Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Project vendors were properly identified	4	12	10	2	0	3.64	.826
2	Contracts were awarded appropriately	8	10	4	6	0	3.68	1.090
3	Relationships with the vendors is properly managed	8	10	6	4	0	3.79	1.031
4	Contracts were properly closed	4	6	14	4	0	3.36	.911
Over all mean		3.62						

(Source: field survey,2023)

As per the responses review, the overall mean is 3.62 which shows that most of the respondents participated in this research believe that potential vendors are identified, contracts awarded properly, and the relationship with the potential vendors were managed properly.

When we look at the mean of each activity in procurement management like project vendors were identified properly, contracts awarded appropriately, relationships with the vendors are managed properly, contracts closed properly are 3.64, 3.68, 3.79 and 3.36. This indicates that for the first three activities the respondents' attitudes is from agree to strongly agree, this indicates that the project vendors are identified, selected, awarded and relationship managed properly. However, with regard to the project were closed properly, a number of respondents uncertain with these activities. This indicates that even though the project procurement practice was good it had a limitation with completing properly. From the research point of view and the discussion with potential participants the time were the project started was critical, since Corona pandemic issues had troubled the international as well as the national procurement activities. In addition, the current global scenario makes the difficulties in the procurement completion.

As the researcher reviewed the progress report of the project implementation the National Quality Infrastructure Project in Ethiopia faced several challenges during its implementation, which affected the implementation schedule and the achievement of the project's objectives. Some of the challenges encountered include:

Procurement Delays: The project experienced delays in the procurement of goods and services, which affected the implementation schedule and caused some activities to be delayed.

Political Instability: The project was implemented during a period of political instability in Ethiopia, which affected the implementation schedule and caused some activities to be delayed or suspended.

COVID-19 Pandemic: The project was also affected by the COVID-19 pandemic, which caused disruptions in project implementation and affected the availability of project personnel and resources.

Despite these challenges, the project was able to achieve its development objectives and make significant contributions to the improvement of the national quality infrastructure in Ethiopia. The project management team and the implementing agencies worked together to address the challenges and find solutions to ensure the successful implementation of the project.

4.4.9. The practices of Stakeholder Management

Table 13. summarize the data that was obtained from the respondents on the practices of project stakeholder management during implementation of NQI project.

As it was submersed in table 13, the average of the respondents mean is 3.65 which shows that most of the respondents participated in this research believe that stakeholders are identified, their engagement is planned and their participation managed well. This indicates that the project management process stakeholder's management practice was successful.

Table 13 Stakeholder Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	Relevant Stakeholders are identified	4	18	4	1	1	3.82	.863
2	Stakeholders' engagement is planned	2	18	6	0	2	3.64	.911
3	Stakeholders' participation is managed well in project implementation	0	18	6	4	0	3.50	.745
Overall mean		3.65						

(Source: field survey,2023)

With specific to the relevant Stakeholders identification and their engagement plan almost all respondents agree, which shows as stakeholder management were properly practiced through the project management processes.

The project implementation strategy document emphasized the importance of stakeholder engagement in maintaining effective implementation of the project. The strategy identified the key stakeholders and their communication needs, their roles and responsibilities and it also provided guidance on how to engage with stakeholders effectively.

Even though, strategy developed for the National Quality Infrastructure Project in Ethiopia helped to maintain effective management of stakeholders. Even same stakeholders didn't agree on their proper engagement, the project team emphasized that selected stakeholder was engaged and their feedback was incorporated into project activities and decisions.

4.4.10. The practices of Integration Management

Table 14. summarize the data that was obtained from the respondents on the practices of project integration management during implementation of NQI project.

Table 14 Integration Management practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	The charted for Project is developed	4	12	10	2	0	3.70	.775
2	An integrated project management plan is developed	0	18	4	4	2	3.36	.989
3	Project knowledge is managed effectively	4	12	8	4	0	3.57	.920
4	Project management plan is monitored through progress	0	16	8	4	0	3.43	.742
5	Project activities are being finalized appropriately	0	12	6	10	0	3.07	.900
Over all mean		3.43						

(Source: field survey,2023)

The table above summarizes the attitudes of the respondents towards the practices of integration of management practices during the project implementation. Most of the respondents agree that the charter for the project was developed and Project knowledge is managed effectively with the mean of 3.70 and 3.57 respectively. The mean 3.36 for integrated project management plan is

developed and 3.07 for project activities are being finalized appropriately indicates that the respondents are uncertain. With regard to project management plan is monitored through progress the mean is 3.43 which indicates that most respondents agree on those activities. When we come to project activities are being finalized appropriately the mean (3.07) is less than the other activities in the category of project integration management, which shows there is a disagreement and uncertainty with the finalization of the project activities.

In general, when we summarize the practices of project integration management, the above result indicates that project charter is developed, project knowledge is managed effectively and project management plan is monitored through progress. However, project activities are not finalized (completed) appropriately

4.4.11. The practices of Senior management support

Table 15. summarize the data that was obtained from the respondents on the practices of project senior management support during implementation of NQI project.

Table 15 Senior management support practices

No	Factors	5	4	3	2	1	Mean	STDEV
1	The commitment of the senior managements to follow the project	6	12	8	2	0	3.79	.876
2	Top managements are committing for resources management	2	16	4	4	2	3.43	1.069
3	There are quick decisions making of higher management for the project	0	10	10	8	0	3.75	1.206
4	Staff training and incentive managed properly	2	6	8	10	2	2.86	1.079
Over all mean		3.46						

(Source: field survey,2023)

The mean 3.79 is for the senior management's commitment to follow up the project shows most respondents agree on it and the mean 3.43 is for top management's commitment on resource management indicates the agreement of the respondents. However as indicated in the table 15 the respondents disagree on managing staff training and incentive management. With regard to the quick decisions making of higher management for the project, the mean indicates that there is agreement among the respondents.

When we sum-up the results, most respondents agree on the commitment of the top management to follow up and avail resources for the effectiveness of the project. However, with regard to internal staff motivation and training top management didn't manage it appropriately. When we look at the quick decision of the higher management the variation may come due to the different components of the project units.

Table 16 project management implementation practice summary

Project management Knowledge area	Average mean	Good practice area	Limitation in practicing the Knowledge area	Interpretation
Schedule Management	3.72	The duration for the activity's estimation is good	Tools and technique like (CPM/PERT) are used effectively	Agree (High)
Scope Management	3.85	Detailed description of the project is developed	Stakeholder's requirements are properly collected	Agree (High)
Cost Management	3.53	Is the Budget allocation being appropriate	Project cost is being properly controlled	Agree (High)
Quality Management	3.77	Relevant quality standard is identified	Quality is assured for each activity	Agree (High)
Risk Management	3.35	Project risks are	Risks are monitored	Uncertain

		identified properly, analyzed	effectively	(Moderate)
Resource Management	3.5	Resources for activities are properly estimated	HR management tool is applied to motivate train and reward employees	Agree (High)
Communication Management	3.37	Project performance is reported regularly	Effective mechanism for feedback is used	Agree (High)
Procurement Management	3.62	Relationships with the vendors is properly managed	Contracts were properly closed	Agree (High)
Stakeholder Management	3.65	Relevant Stakeholders are identified	Stakeholders' participation is managed well in project implementation	Agree (High)
Integration Management	3.43	The charted for Project is developed	Project activities are being finalized appropriately	Agree (High)
Mean of mean	3.58			Agree (High)

The mean of mean 3.58 in table 16 indicate that the practices of the project management knowledge area fall to the moderate stage. This indicates that most of the respondents agree on the overall project implementation practices of NQI institutes expansion projects.

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1.Introduction

In this chapter the research findings, conclusions as well as recommendations are discussed.

5.2.Summary of findings

The main goal of the study's is to evaluate (assess) the project knowledge areas practice of NQI project implementation at the NQI institutes which was funded by the world bank focusing to strengthening the institutional capacity of national quality infrastructure development. These institutions are the Ethiopian Standards Institute (ISE), Ethiopian National Accreditation Service (EAS), National Metrology Institute of Ethiopia (NMIE) and Ethiopian Conformity Assessment Enterprise (ECAE). The assessment focused on how the world bank funded project are implemented and how the project different knowledge components managed.

By using both a hard copy and web-based questioners as per the preferences of the respondents 30 respondents were selected from the different units of the project, including managers, team leaders, experts, and consultants. The information from the 28 participants were collected, the data was analyzed by using SPSS software to get the average and standard deviation. The questionnaires were developed using Likert scale with 5 points and the response were presented and interpreted in the previous chapter four.

Therefore, the following arguments indicates the findings of the research:

- Planning is the most important aspects of project preparation. The project initial schedule is maintained as per the plan.
- The duration for the project activities was good. The NQI project units maintained a good duration estimation for the different activities and the modification made based on the uncertainty is also good.
- Network techniques help the management of an organization in performing the project functions efficiently and effectively. The practices for scheduling tools and technique like CPM or PERT was not good. Since the schedule developed to the effectiveness of the

project didn't practice properly, for example same laboratory machine were purchased before completing the laboratory building. This leads for delay of the installation of the instruments.

- Project activities Implementation Plan were developed, defined and sequenced properly. The right definition and sequencing activities are very important things for the effectiveness as well as proper completion of the project on time. When we look at the practices of project implementation plan it is well defined and ordered properly.
- The project scope management practices were categorized as detailed description of the project, Project work is subdivided to smaller manageable components, Project scope changes is managed appropriately, activity list and attributes is properly seated, Stakeholder's requirements are properly collected. Based on this the study shows it was managed properly.
- The survey indicates that project cost was estimated properly, budget allocation for the project were appropriate, However, with regard to project cost is being properly controlled the survey indicates most of the respondents are uncertain which indicates a poor management practice with this regard.
- The quality management practices include identification of relevant quality standard, developing quality plan, implementing the planned activities, monitoring and assuring if the specification had been met. Based on this the study shows it was managed properly.
- Risks are obvious in project activities. When we see the practices in the study risk management is planned, project risk identified analyzed, mitigation plan was prepared but there is a limitation in addressing the risk timely. And the overall result shows towards moderate practice of risk knowledge.
- The activities like planning the resource management, estimating resources for the activity properly, However, appropriate HR management tool were not applied properly to motivate and reward employee and planned resources used as allocated were not managed properly as per the study.
- With regard to the practices in the communication management, appropriate communication plan was developed and the study also indicates performances were

reported regularly. However, there is a limitation in the mechanism on dealing with communication barrier, timely communication was not in place and effective mechanism were not used to feedback, there is also limitation in the effective dissemination of information to the stakeholders.

- With regard to procurement management the study indicates that vendors were identified, selected, awarded and relationship managed properly. However, the survey indicates that project was not closed properly.
- Stakeholder management practice survey result indicates that stakeholders were identified, plan was developed regarding their engagement and their role managed well.
- With project integration management practices Project charter developed that authorizes the project existence, knowledge regarding the project was effectively managed, project management plan was monitored through progress. However, there is a limitation on developing an integrated project management plan and also the project activities were not being finalized appropriately.
- The top management support for on availing resource and follow up were good. However, with regard to internal staff motivation and training top management didn't manage it appropriately.

5.3.Conclusions

Proper implementation practices of a project are effective tools of management to meet the project objectives. Since project execution follows a definite path of planning, scheduling, and controlling. The project implementation is determined at the project design and planning paths, which enables to identify the flow of event which must take place for successful implementation of the project. It breaks the strategy into details and these are used to compile the sequential narration of the constituent activities of the project.

When we see the overall output of this study of the practices of implementation of NQI projects at the NQI institutes (ECAE, EAS, ISA, EMI) most respondents agree with the project implementation practices, like project cost, scope, quality, communication, risk, resource, integration, procurement, stakeholders as well as senior management support. However, for activities to be undertaken properly networking tools/ techniques were not properly implemented, there is a gap in closing the activities, cost efficiency is not appropriate, the

practices of managing staff training are not good and there are no proper incentive management practices, that means appropriate HR management tool were not applied properly to motivate and reward employee, there is also a limitation in addressing the risk timely. In addition, the study indicates that there is a limitation in the effective communication and dissemination of information to the stakeholders. Even though the project implementation practice was good the above findings indicates that there are issues in the project implementation practices.

5.4.Recommendation

Based on the research findings, the researcher of this paper recommends some points for future improvement in the areas of similar project and further studies in the area. While implementing a big project in the area of quality infrastructure,

- With regard to project implementation practices the NQI project unit have to consider and use proper project scheduling tools for the initial activities to be maintained, appropriate networking tools/ techniques have to be implemented, different incentives mechanism and training should be arranged for the project team. Project activities must be finished and closed properly as per the contract. Proper communication mechanism has to be in place. The mechanism to dissemination information to the stakeholders have to be improved. Proper mechanism should be implemented in addressing the risk timely. The lesson learned from the different activities have to be managed properly and should be kept for the future.
- The senior management supports for the effectiveness and efficiency of the project activities have to be aligned with the capacity training and incentives of internal staff, which helps for implementing the project activities successfully.

It is recommended for future research that:

- Due to time constraints and project scope limitation only few components of the project were considered. Thus, for the studies to be conducted in the future, it is recommended to enlarge the assessment areas of the project management practices and other important issues in the same project areas by including the different stakeholders and beneficiaries. This will give a clear image of the NQI projects implementation at a national level.
- To assess the impact of the project implementation practices on the overall project success.
- To assess the impact of the project implementation on the overall goal of the project designed.

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Appendixes

Annex 1 Interview Questioner

Addis Ababa University College of Business and Economics School of Commerce

Master of Project Management Program

Dear Respected project managers and team members:

This interview is conducted to collect data for research on: **assessment on project management practices: a case study on national quality infrastructure institutes–project** expansion in Ethiopia. The information is going to be used as a primary data for this research. Therefore, your response and participation in the interview will be extremely valuable for the study. Please note that confidentiality of your response is secured and used only for the purpose of this study.

Thank you in advance for your voluntary participation.

Kind Regards

Mekonnen Habtemichael

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1. Did the Project cost effectively estimated and appropriate budget was allocated; Project cost is being properly controlled and effective cost management tool is used and communicated to all stakeholders?
2. Did the project take longer than planned? If yes, what kind of related costs does the project incurred? _____ If no, how did you manage it? _____

3. Did the final cost of the project exceed the initial budget?
4. Do roles and responsibilities, clearly communicated to all team and stakeholders?
5. If your answer for question number (2) is no, how did you manage it?
6. Was there a project scope change during the execution phase?
7. Were the time schedule, budget, resource and quality of the deliverables monitored closely throughout the project's life-cycle? And how?
8. Did you notice early warning signs of problems (risks) that occurred in the project, and did you monitored and mitigate in time?
9. Did the final deliverables of the project (Quality is assured for each activity) satisfy the needs or requirements of all stakeholders?
10. Did the senior managers applied a mechanism to train and reward employees for the success of the project?

Annex 2 Close ended Questionnaires

Dear respondent,

First of all, I would like to express my appreciation in advance for your willingness to spend your valuable time to reply to this research questionnaire.

My name is Mekonnen Habtemichael and a student of project management at Addis Ababa University school of commerce.

This questionnaire is designed to collect appropriate information for the research carried out on the topic: " Assessment of National Quality Infrastructure (NQI) project implementation, a case study on National Quality infrastructure Institutions ".

The study is for academic purposes, as part of the Master of Project Management program's requirements.

Please accept my sincere gratitude in advance for your assistance.

Instructions

- Writing a name and address is not necessary

1. General Profile:

Code	Profile					
Q-1	Gender	Female		Male		
Q-2	Age	20-30	30-40	40-50	50-55	
Q-3	Qualification	Diploma	Degree	2 nd Degree	Doctorate Degree	
Q-4	Experience in the NQI area	< 3	3-7	8-10	10-15	>15
Q-5	Position during the project implementation	Junior expert	Senior expert	Team leader	Director	Manager
Q-6	Your working areas in the organization	Technical Management		Project Management	Administration Management	

2. Close Ended Questions:

Choose one of the five scale of the questions under each category that best describes your perception of how the practices of project implementation of NQI projects, with Strongly Disagree (SD)=1, Disagree(D)= 2, Uncertain(U)= 3, Agree(A)= 4 and Strongly Agree (SA)= 5

7. Practices Schedule Management of NQI projects at your organization

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q7-1	The initial project schedule is maintained throughout the project					
Q7-2	Effective tools and technique (CPM/PERT) are used for scheduling					
Q7-3	The estimation of duration for the activities is good					
Q7-4	Activities were defined well in project implementation plan					

8. Cost Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q8-1	Project cost is effectively estimated					
Q8-2	Appropriate Budget was allocation					
Q8-3	Project cost is being properly controlled					
Q8-4	Effective cost management tool is used					
Q8-5	By evaluating vendors/ suppliers' efficiency of cost ensured					

9. Scope Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q9-1	Detailed description of the project is developed					
Q9-2	Project activities divided in to manageable size					
Q9-3	Project scope changes is managed appropriately					
Q9-4	Activity attributes is seated properly					
Q9-5	Stakeholder's requirements are properly collected					

10. Quality Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q10-1	Relevant quality standard is identified					
Q10-2	plan for quality is developed					
Q10-3	The plan is implemented properly					
Q10-4	Quality is being monitored/ controlled for meeting specifications					
Q10-5	Quality is assured for each activity					

11. Communication Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q11-1	Appropriate communication plan is developed					
Q11-2	communication of project information is communicated timely					

Q11-3	Mechanism to deal with communication barrier is used					
Q11-4	Project performance is reported regularly					
Q11-5	Effective mechanism for feedback is used					
Q11-6	Information is disseminated timely to stakeholders					

12. Risk Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q12-1	Risk management is planned					
Q12-2	Project risks are identified properly					
Q12-3	The identified risks are analyzed					
Q12-4	Mitigation plan are prepared					
Q12-5	Risks are timely addressed					
Q12-6	Risks are monitored effectively					

13. Resource Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q13-1	Resource management is planned					
Q13-2	Resources for activities are properly estimated					
Q13-3	resources are used as per the plan					
Q13-4	Human resource management tool is applied to motivate train and reward employees					

14. Integration Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q14-1	Project charter is developed					
Q14-2	A plan for integrating project management developed					
Q14-3	knowledge of the project is managed effectively					
Q14-4	Project management plan is monitored through progress					
Q14-5	Project activities are being finalized appropriately					

15. procurement Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q15-1	vendors were identified properly					
Q15-2	Contracts were appropriately awarded					
Q15-3	The project vendors relationships managed properly					
Q15-4	Contracts were properly closed					

16. Stakeholder Management practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q16-1	Relevant Stakeholders are identified					
Q16-2	Stakeholders' engagement is planned					
Q16-3	Stakeholders' participation is managed well in project implementation					

17. Senior management support practice of NQI institutes project

Code	Variable	SD-1	D-2	U-3	A-4	SA-5
Q17-1	Commitment of Senior managements are in follow up the project					
Q17-2	Top managements are committing for resources management					
Q17-3	There are quick decisions making of higher management for the project					
Q17-4	Staff training and incentive managed properly					

(Source, PMBOK 6th edition, 2017 and project work of Feven G,2021 AAU)

Annex 3 Reliability analysis for success factors under study.

The questionnaires' reliability was checked by the Cronbach's alpha test coefficient using SPSS 27 software. As reliability measures gives greater confidence that the individual variables are consistent in their measurement. The researcher calculated Cronbach's alpha with a commonly used value 0.70 to measure the reliability of all variables addressed on the questioner. All variables' scores Cronbach's more than 0.70 indicates that the instrument is reliable

Scale: Project Schedule Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.971	4

Scale: Project Cost Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.980	5

Scale: Project Scope Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.992	5

Scale: Project Quality Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.983	5

Scale: Project Communication Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.990	6

Scale: Project Resource Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.991	4

Scale: Project Risk Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.995	6

Scale: Project Procurement Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.993	4

Scale: Project Stakeholders Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.992	3

Scale: Project Integration Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.996	5

Scale: Project Senior Management Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.994	4

Overall Reliability Analysis result

Reliability Statistics

Cronbach's Alpha	N of Items
.997	51