



ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF PROJECT MANAGEMENT

**FACTORS AFFECTING QUALITY OF CONSTRUCTION
PROJECTS: IN THE CASE OF SELECTED BUILDING
CONSTRUCTION INDUSTRIES IN ADDIS ABABA,
ETHIOPIA**

**A Thesis Submitted to St. Mary's University, School of Graduate
Studies, Department of Project Management for The Partial
Fulfillment of the Requirement for Masters of Art Degree in
Project Management**

BY:
NEGA GELETU

ADVISOR:
ABEBAW KASSIE (Ph.D.)

JULY, 2020
ADDIS ABABA, ETHIOPIA

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Declaration

I, the under signed, declare that this thesis entitled “*FACTORS AFFECTING QUALITY OF CONSTRUCTION PROJECTS: IN THE CASE OF SELECTED BUILDING CONSTRUCTION INDUSTRIES IN ADDIS ABABA, ETHIOPIA*”, is my original work and to the best of my knowledge has not been presented for a degree by any other person, and that all the sources of material used for the thesis have been duly acknowledged.

Declared by:

NEGA GELETU

Date & Signature

Statement of Certification

This is to certify that the thesis carried out by **NEGA GELETU** on the topic entitled: *“FACTORS AFFECTING QUALITY OF CONSTRUCTION PROJECTS: IN THE CASE OF SELECTED BUILDING CONSTRUCTION INDUSTRIES IN ADDIS ABABA, ETHIOPIA”* is his original work and is suitable for submission for the award of Masters of Art Degree in Project Management.

Advisor

ABEBAW KASSIE (Ph.D.)



Date & Signature

Acknowledgements

I acknowledge the Almighty God for giving me good health which was essential for me to finish my studies.

I also acknowledge my supervisor, Dr. ABEBAW KASSIE, for taking me through the research process successfully from topic formulation, proposal writing and finally the project report. His skill for guidance, constructive criticism, patience, enthusiasm and suggestions supported the efforts to get this project successful. You are a professional indeed.

Lastly, I acknowledge building construction industries in Addis Ababa, Ethiopia who provided me with the information I needed for me to complete this study.

God bless you.

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Acronyms

NEDO: National Economic Development Office

QP: Quality Performance

SPSS: Statistical Packages for Social Sciences

Abstract

In Ethiopia the number of building construction projects are increasing from time to time. Since quality of building construction projects is one of the traditional and global measure of building construction project performance, no matter what definition we follow for quality, it becomes very complex when we try to put it into the actual practice. Hence, poor quality project delivery is major problems that face construction projects inside the construction industries, and it's of high concern to those who are involved in the industry. Thus, the study was conducted by selecting building construction projects from Addis Ababa, Ethiopia. The projects comprise different category of building construction projects such as office, commercial, apartment, multipurpose and hospital buildings. These study carried out and investigate factors affecting quality of building construction projects: in case of selected construction industries in Addis Ababa, Ethiopia. The study adopted literature review, a questionnaire survey, and descriptive survey research in order to achieve its specific objectives. And in order to achieve the overall study objectives, the research considered and examine independent variables (stakeholder engagements, project funding, construction materials, and project management ability) and moderating variable (project distinctive) against dependent variable (quality of construction projects). The research examined independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) against the dependent variable (quality of construction projects). The data for the study was collected from a sample population of 273 respondents of selected construction industries of responsible departments related with the study, and it was arrived at with a 95% confidence level and an error of 0.05. The relationship proposed in the framework were tested using Pearson correlation, and the causal relations were analyzed using regression analysis. From the result of the analysis, it is concluded that there is the fact that both independent and moderating variables have a positive and significant influence on dependent variable which determined factor affecting of quality of building construction projects in Addis Ababa, Ethiopia, under the case study area has influenced by both independent and moderating variables significantly.

Keywords: *Quality, Construction projects, Quality of construction projects, Questionnaire survey.*

CHAPTER ONE

INTRODUCTION

This topic begins with a brief background to the study, which leads to an introduction of the building construction industries, and briefly describes statement of the problem of the study, research question, objective of the study, significance of the study, scope of the study, basic assumptions of the study, definition of significant terms, and organization of the study then be presented.

1.1 Background of the Study

In executing construction projects, achieving quality is one of the ultimate objectives of all stakeholders (Ofori, 2006). Quality can be described as meeting specifications and approved standard agreed by stakeholders. It was also described as the totality of features and distinctive of production process that bear on its ability and capacity to satisfy the stated need or fitness (Aoieong, *et al.*, 2002). Nonetheless, (Jha and Iyer, 2005) concluded that this has been extremely difficult to achieve in practice. (Chinchu *et al.*, 2017) describes quality as the world's oldest documented profession. Quality professionals use a number of definitions to define project quality. Quality in its simplest form can be defined as: 'meeting the customer's expectations,' or 'compliance with customer's specification.' No matter what definition we follow for quality, it becomes very complex when we try to put it into actual practice. For a user, quality is nothing but satisfaction with the appearance, performances, and reliability of the project for a given price range. The quality in the construction industry is linked with client's satisfaction and the implementation of a quality management is a key tool in consistently and reliably managing the construction Mane (2015). From the perspective of a construction company, quality management in construction projects should mean maintaining the quality of construction works at the required standard so as to obtain customer's satisfaction that would bring long term competitiveness and business survival for the companies. The construction project has increased rapidly in the recent years, reflecting the interest of private and public sector investing more funds into development in developing countries like Ethiopia. Moreover, attention is given to basic social sector infrastructure in public sectors particularly Health, Education, Water and other projects.

Now quality management has become an integral part of construction projects (Birhanu, 2011). Quality is an intangible term and also because of the fact that construction projects involve multidisciplinary teams consisting of architects, designers, project managers, contractors, subcontractors, suppliers, each discipline can have a different definition of success and failure

depending upon individual goals and objectives. Therefore, it is important to define quality first in order to assess it on different projects. This holds true for identifying factors that affect the quality performance of projects. Quality performance can be defined in terms of compliance to schedule and budget and customer satisfaction. Since quality is one of the critical factors in the success of construction projects. Quality of construction projects, as well as project success, can be regarded as the fulfilment of expectations (i.e. the satisfaction) of the project participants. The construction industry in Ethiopia has been struggling with quality issues for many years. A significant amount of the budget is spent each year on infrastructure and other development projects. Since the quality outcomes of the projects are not according to required standards, faulty construction takes place. Consequently, additional investments are required for removal of defects and maintenance work. A construction project in its life span goes through different phases. The main phases of a project can be described as: conceptual planning, feasibility study, design, procurement, construction, acceptance, operation and maintenance. (Ashokkumar, 2014) stated that quality of construction projects is linked with proper quality management in all the phases of project life cycle. Design and construction are the two important phases of project life cycle which affect the quality outcome of construction projects significantly. In a NEDO (National Economic Development Office), London survey aimed at improving methods of quality control for building works it was found that "design" and "poor workmanship in the construction process" combined to form more than 90% of the total failure events (Ashokkumar, 2014).

This paper therefore carried out and identified factors affecting quality of construction projects: in case of selected construction industries in Ethiopia, by means of a literature review and a questionnaire survey, and adopted descriptive survey research to achieved its specific objectives which are; determining the influence of stakeholder engagement on quality of construction projects in Addis Ababa, Ethiopia, study evaluated the extent to which construction materials affect quality of construction projects in Addis Ababa, Ethiopia, investigated the effect of project funding on quality of construction projects in Addis Ababa, Ethiopia, and assessed the influence of project management ability on quality of construction projects in Ethiopia.

1.2 Statement of the Problem

The construction industry plays a fundamental role in the economy. Urban areas hold more than half of the human populace and consequently fabricating proprietors are in rush to complete development projects (Walley, 2011). Along these lines, the requirement for accomplishing quality projects in the building development is essential. Quality is a fundamental component for

manageability and consumer loyalty. Stop and Papadopoulou (2012) indicate that around the world, development ventures encounter timetable, cost, and quality deviations from their unique arrangement. The frequencies of building failure, and poor administration of undertakings, superfluous surge in project usage, lacking organization and budgetary arrangements and exorbitant project management, have ended up significant issues in Ethiopia. Ethiopia has a huge building construction projects, which is developing each year and is progressively pervasive in urban zones including Addis Ababa. The rate of construction of buildings in Addis Ababa is high to accommodate the rising number of people looking for investments and settlements.

Poor quality standards were problem faced by construction industry in different construction projects, and serious problem as the expected quality is not complied in the construction projects (Aftab, 2013). Failure in achieving required quality has also significant impact of project cost. Koskela (1992) stated that quality cost (non-conformance) in construction industry of USA contributed to 12% of total project cost. (Oluyemi *et al.*, 2019) and (Love and Peter, 2002) studying quality performance of construction projects through case studies showed that quality failures had resulted in rework which incurred extra cost approximately 2% to 12% of project cost while (Marosszeky *et al.*, 2002) stated that quality rectification problems contributed to approximately 3.4% to 6.2% of project cost. (Arditi and Gunaydin, 1997), identified among other factors; lack of management commitment to continual quality improvement; lack of quality training of staff; management leadership; efficient team work among stakeholders as generic factors that affect the quality process.

There are also few studies made on construction project management in general and quality management in particular in the Ethiopian context; according to (Biyadgign, 2015) in his research work stated that The critical factors that affecting performance has been escalation of material prices, unavailability of resources, number of disputes between owners and project parties, review of failures and solving them and quality of equipment's or machineries and raw materials. The main key performance indicators have been cost, time and quality. It's hoped that these findings will guide efforts to improve the performance of the construction industry in the future. Similarly, (Abraham, 2004) showed to enhance understanding of low performance of public construction projects in Ethiopia by taking two case studies from public construction projects. The research indicated that the performances of public construction projects exhibited low accomplishment rates. Consequently, completion time, cost overruns and strongly associated with quality related issues contributed to low performances for both the case studies (Abraham, 2004). Other study by (Fetene, 2008) stated that "Building projects that are delivered within estimated cost, specified

quality, and calculated time can greatly satisfy client, contractor and consultant and also the project can be said it is delivered in successful manner. But almost all building projects in our country are not lucky to be delivered successfully to the client” (Fetene, 2008). This is also further strengthened another study which states that “From the view point of cost, completion time and quality of the projects, the construction Industry of Ethiopia is not at required level compared to the rest of the world” (Bereket, 2015). However, from the literature reviewed none of the scholars has evaluated on the factors influencing quality of building construction projects in Addis Ababa city. This study will fill this gap by answering the question; what are the factors that influence the quality of building construction projects in Addis Ababa, Ethiopia?

1.3 Research Questions

In order to achieve the intended objectives of the study and to address the research problem, the major research question for this work is:

How to identify factors affecting quality of construction projects: in case of selected construction industries in Addis Ababa, Ethiopia?

The major question would be further divided into two sub research questions in order to reach to the specific aims of the study. The research questions to achieve the specific objectives were:

What do the existing construction quality problems look like in the case of selected building construction industries in Addis Ababa, Ethiopia?

What are the factors influencing quality of construction projects in the case of selected building construction industries in Addis Ababa, Ethiopia?

1.4 Objectives of the Study

1.4.1 General Objective

The main objective of the study was to evaluate factors affecting quality of construction projects in Ethiopia. Furthermore, the objective has delivered a conclusion on critical feedback to construction project owners and provided a decision making process in the management of infrastructure projects.

1.4.2 Specific Objectives

This study has believed to attain the following objectives specifically;

To investigate what does the existing construction quality problems look like in the case of selected building construction industries in Addis Ababa, Ethiopia?

To determine what are the factors influencing quality of construction projects in the case of selected building construction industries in Addis Ababa, Ethiopia?

1.5 Significance of the Study

The findings of this study would help inform policy makers on factors that have implications on quality of building construction projects. Policy makers would further be in a better position to formulate, design and implement policies that would ensure quality of buildings in the County. The study would also help provided critical feedback to building owners. It would inform decision making process to the various stakeholders involved in the management of infrastructure projects. The adoption of better decisions would improve on the implementation of other projects to help save on time and money.

1.6 Scope of the Study

There are many methods for selecting participants, and the type of sampling depend on how you would use the information. Since this research focused on to identifying factors affecting quality of construction projects: in case of selected construction industries in Addis, Ababa, Ethiopia; and the study selected top management of construction companies, contractors, country inspectors, national government officials and project owners who provided the best information in the study case area, and they are highly exposed to construction projects. Hence, data for this research were collected from top management of construction companies, contractors, country inspectors, national government officials and project owners, and selecting all these participants purposively to get the best information in the study area.

1.7 Definition of Significant Terms

Stakeholder Engagement: Is the process by which an organization involves people who may be affected by the decisions it makes or can influence the implementation of its decisions.

Project Funding: Funding of long-term infrastructure projects

Construction Materials: These are materials used in the construction project including cement building blocks, sand etc.

Project Management Ability: This is a strategic advantage gained by organizations that master it

Quality of Building Construction Projects: Quality means the absence of defects, performance, durability, fitness for purpose; standard relative to things of a similar kind.

1.8 Organization of the Study

The study was organized into five chapters. Chapter one contains the background of the study, statement of the problem, objectives, research questions, significance of the study, basic assumptions of the study and the organization of the study. Chapter two is the literature review and the chapter will also present a theoretical and conceptual framework showing the variables and the various indicators. Chapter three outlines the research methodology which would be used in the study and includes research design, target population, sample size and sampling techniques, sample size, sampling techniques, research instruments, questionnaires, validity of the instruments, reliability of the instruments, and finally piloting of the research instruments. The study would also present the operationalization of variables table. Chapter four shall present analysis, presentation and interpretation of data while chapter five entailed summary of findings, discussions of findings, conclusions, recommendations and suggestions for further studies.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This section covers review literature of different scholars and authors that have been reviewed in the area of construction projects with special focus on factors affecting quality of construction projects. It deals with both theoretical and practical findings of various researcher's concepts related to quality, quality in construction projects and factors affecting quality of construction projects. It deals with the review of related literature gathered from different secondary sources such as published books, articles and related websites. In this regard, efforts were exerted to include as much significantly related literatures as possible by reviewing available documents that exhibits points, targeting at the attainment of the research objectives.

2.2 Theoretical Literature Review

2.1.1 Quality

The success of a project found in the literature depends on the project quality as a key concept (Romeo *et al.*, 2014). (Arditi and Gunaydin, 1998) define the concept of quality as meeting the legal, aesthetic, and functional requirements of a project. (Eng and Yusof, 2003) explain quality as both a philosophy and a set of guiding principles that represents a continuously improving organization.

Quality can be translated into the quality dimensions that include: levels of quality, reliability and safety, quality performance, durability, and serviceability (Mc Goerge and Plamer, 2000); (Luu *et al.*, 2008); Wanberg *et al.*, 2013). (Jung and Wang, 2006) argue that it is the role of management to ensure the achievement of established requirements in a project as competition increases and change occurs in the business world. Understanding how closely the project conforms to its requirements, a high quality project can be described by such terms as ease in understanding drawings, level of conflict in drawings and specifications, construction economy, ease of operation and maintenance, and energy efficiency (Arditi and Gunaydin, 1997). According to (Al Nofal *et al.*, 2005), quality requires radical change to traditional management practices. Quality is one of the most complex practices for any company; it

requires implementing a new way of managing business and culture which not only affects the whole organizational process and employees but also the allocation of significant resources (Santos *et al.*, 2002; Jung *et al.*, 2009).

Quality needs control which is the specific implementation of the quality assurance program. Effective control for quality reduces the possibilities of change, mistakes and omissions, which in turn result in fewer conflicts and disputes. Most of the engineers and architects were in total control during the design phase. During the construction phase, they carried out a role described as “supervision,” insuring that the owner received his money’s worth in terms of quality. Recently, owners became increasingly concerned with cost and schedule, areas where design professionals were not providing good control. Engineers and architects must work together to achieve specified goals of quality and liability control, recognizing that each person and each activity affects and in turn is affected by others. As competition increases and changes occur in the business world, companies look for high levels of effectiveness across all functions and processes and choose quality management as a strategy to stay in the business.

2.1.2 Quality in Construction Projects

In a construction project, quality management has been widely used by world-class companies to ensure successful projects delivery (Ahmed, S.M., 2012). The interactions and interrelationships between key participants (e.g. the client, the architect, and the contractor) largely determine the overall performance of the construction project. Notwithstanding this mutual dependency, the performance of individual participants remains important because the overall performance is a function of the performance of each participant (Lianying and Weijie, 2013).

According to (Arditi and Gunaydin, 1997; Turk, 2006; Hiyassat, 2000), quality in the construction industry can be defined as meeting the requirements of the designer, constructor and regulatory agencies as well as the owner. Based on the three studies above, quality can be characterized based on meeting the requirements of the owner (e.g. functional adequacy, completion time, budget; and lifecycle costs), design professional (e.g. well-defined scope, qualified staff, adequate information prior to design, provisions for decisions by owner and design professional, and contracting to perform work), constructor (e.g. contract plans, specifications, timely decisions, and contracting to perform work), and regulatory agencies (e.g. public safety and health, environmental considerations, protection of public property, and

laws and regulations). Moreover, one should also differentiate between product quality (the physical product itself) and the process quality (the activities that causes the product to be either acceptable or not) in a project (Culp *et al.*, 1993). For example, “product quality” in the construction industry may refer to achieving quality in the materials, equipment and technology that go into a structure building, where “process quality” may refer to achieving quality in the way the project is managed in the three main phases of construction process which are planning and designing phase, construction phase, and operation and maintenance phase (Burati and Oswald, 1993; Arditi and Gunaydin, 1998; Lai and Cheng, 2003).

The construction industry and its quality presently are facing urgency of shaping a sustainable construction process (Zhai *et al.*, 2014). The role of quality in construction has been emphasized by the use of various aspects of quality tools and techniques (Metri, 2005). Many organizations are frustrated in their effort to improve quality because these companies have exclusively focused on financial measures instead of quality measures (Torbica and Stroh, 1999; Sharmma and Gudanne, 2002). Construction firms, therefore, need to understand the quality factors for their success in order to establish quality factors for construction firms (Saeed and Hasan, 2012). Although quality has been widely implemented in the Japanese construction industry since the 1980s and in the American construction field since the 1990s, it has not yet been implemented successfully in developing countries (Abdel-Razek, 1998; Kazaz *et al.*, 2004; Abdel-Salam and Gad, 2009).

Many studies have demonstrated that project management action is a key element in achieving quality in construction. The success of quality management depends heavily on management practices. These practices include: motivation by the contractor’s senior management, commitment of top managers to site management (Abdel-Razek, 1998), and integration of continuous improvement activities into the strategic goals across the whole organization, across boundaries and at all levels. Contractors, for example, need to define their objectives by creating a harmony through mutual co-ordination among all parties (Asim *et al.*, 2013).

Factors affecting the cost and quality of construction were studied by (Jamaludin, *et al.*, 2014), they include fraudulent practices and kickbacks; incorrect planning; level of competition; number of competitors; lack of coordination between designers and contractors; poor financial control on site; wastage on site; previous experience of contractor and frequent design changes. According to (Kazaz and Birgonul, 2005; Turk, 2006; Haseeb *et al.*, 2011), construction firms have some deficiencies in getting stability in a quality concept when their business structures

use temporary labors and change their location constantly and consequently. Furthermore, construction projects are widely seen as unpredictable in terms of delivery time, budget, profitability, and the standards of quality expected (Love *et al.*, 2000). Some differences must be considered when applying a quality program to construction projects (Arditi and Gunaydin, 1998; Pheng and Teo, 2004; Romeo *et al.*, 2014). These differences illustrate that almost all construction projects are single order-production products, each construction production site always displays different conditions; the lifecycle of a construction project is much longer than the lifecycle of most manufactured products, and there is no uniform standard in evaluating overall construction quality. Thus, construction projects usually are evaluated subjectively, and the participants in the construction project (e.g. owner, designer, general contractor, subcontractor, material supplier, etc.) differ for each project.

2.1.3 Stakeholder Involvement and Quality of Building Construction Project

Stakeholder Management is about connections between an organization and their groups intrigued or partners. These connections influence the people and their associations that could be certain, or impact any fruitful venture. Along these lines, the Stakeholders from any venture ought to be required by the associations with the standpoint to minimize the negative effects and ensure that there are no hindrances in the method for a fruitful venture. Stakeholder administration concentrates on comprehension stakeholder' needs and desires, tending to issues as they happen, overseeing clashing interests and encouraging suitable stakeholder engagement in venture choices and exercises (Seddon, 2008).

As demonstrated by (Aliverdi, Naeni and Salehipour, 2013), materials speak to a noteworthy segment of things and project costs. The cost characterized as materials incorporate between 20-half of the total wander cost and every so often more. A couple thinks about assumed that materials speak to around 50-60% of the wander cost. Better material organization practices could consequently extend capability in operations and reduce general cost (Hwang and Ng, 2013). Beat organization and wander proprietors should give watchful thought to material organization because of material insufficiencies, high advance charges, increasing expenses of materials, and competition. There is a creating care in the advancement business that material organization ought to be tended to as an expansive composed organization activity.

Given the developing number of stakeholders and their numerous variable desires, the contrasting desires of partners can't be accomplished in the meantime. It is consequently critical

to deal with the continually moving harmony between the interests of stakeholders. The Stakeholder management ought to incorporate the administration of their connection with the venture and the association keeping in mind the end goal to bolster their destinations. In this sense, they ought to make a positive situation in which to build up a firm trust in each other (Deng, T., & Zhou, X., 2010).

Besides, the way that stakeholders are rapid and their impacts on the venture change after some time contingent upon the issues being considered, can prompt to instabilities in any venture if the stakeholders and their needs and potential impact are not deliberately identified and oversaw (Deng, T., & Zhou, X., 2010). The inability to recognize the worries of restricting outside stakeholders will bring about a drawn out and deferred arranging and plan due to the consolidated powerbase of contradicting stakeholders conflicting with the advance of the venture as an aftereffect of saw non-contribution and thought of their interests (Olander, 2007). It is important that the dynamism of partners' advantage has brought about deferrals in the arranging and usage of some significant development projects.

2.1.4 Project Funding and Quality of Building Construction Project

Project funding was defined by (Finnety, 2009) as rising of funds to finance an economically separable capital investment project, which the providers of funds look essentially to the income from the project as the wellspring of assets to benefit their advances and give the profits of value put resources into the project. Advance, (Mateseche, 2013) characterize extend funding as funding a specific monetary unit in which a bank is fulfilled to look at first to the income and profit of that monetary unit as the wellspring of assets from which an advance will be reimbursed and to the benefits of the financial unit as the security for the advance.

Funding of development projects is subsequently anticipated that would be a monetary speculation. In an economy of a nation, development industry helps in making riches and business openings (Olatunji, 2010). It assembles and additionally grow foundation that encourages the administration business. Along these lines it can goad monetary development no matter how you look at it. Encourage, in an improvement of any nation, the development business assumes fundamental parts in changing the goals and the requirements of its kin into reality by actualizing different physical structures (Ahmed, 2010). In that capacity, government offices organize interests in development projects.

As a development project is a speculation that ought to at last bode well, there is thusly the requirement for the development experts to offer unmistakable arrangements as far as defeating development delays. Projects are key exercises started to make monetary esteem and upper hand (Shenhar *et al.*, 2010). Key to funding tasks is supportability. The conventional types of funding tasks have been value and obligation. However, in the later past imaginative methods for funding projects have come up and these incorporate uncommon projects vehicle, investment and so on development tasks are additionally subsidized by multilateral bodies and outside guide.

The cost characterized as materials incorporate between 20-half of the total wander cost and every so often more. A couple thinks about assumed that materials speak to around 50-60% of the wander cost. Better material organization practices could consequently extend capability in operations and reduce general cost (Hwang and Ng, 2013). Beat organization and wander proprietors should give watchful thought to material organization because of material insufficiencies, high advance charges, increasing expenses of materials, and competition. There is a creating care in the advancement business that material organization ought to be tended to as an expansive composed organization activity. (Olatunji, 2010) states that groups in the development part work in a globalized advertise, with vast project groups and jointed tasks with universal organizations in which they show social contrasts, proficient morals and diverse thoughts regarding how to direct business.

2.1.5 Construction Materials Management and Quality of Building Construction Project

The prerequisites for a fruitful administration framework structure is obligatory in any improvement amplify. A number of organizations have expanded the productivity of their activities with a particular true objective to remain engaged and secure future work. Huge change and cost save assets would give off an impression of being possible through enhanced materials organization. Perfect openness of materials and structures are vital to productive advancement (Enshassi, Mohamed and Abushaban, 2009). Materials organization limits are consistently performed on a partitioned commence with immaterial correspondence and no unmistakably settled obligations doled out to the proprietor, master or legally binding labourer. As demonstrated by (Aliverdi, Naeni and Salehipour, 2013), materials speak to a noteworthy segment of things and project costs. The cost characterized as materials incorporate between 20-half of the total wander cost and every so often more. A couple thinks about assumed that

materials speak to around 50-60% of the wander cost. Better material organization practices could consequently extend capability in operations and reduce general cost (Hwang and Ng, 2013). Beat organization and wander proprietors should give watchful thought to material organization because of material insufficiencies, high advance charges, increasing expenses of materials, and competition. There is a creating care in the advancement business that material organization ought to be tended to as an expansive composed organization activity.

While clearly materials should be procured at the most insignificant cost possible to give hold assets to the association, the nature of the materials used will in like manner inside and out effect the way of the improvement expand (Fisk and Reynolds, 2011). Material testing is principal in all endeavours, particularly the building parts. This is in light of the fact that a wrong examination of a material would finally be dangerous to people and the earth since it will lead to construction of poor quality structures that may collapse causing danger to both people and earth. Improvement associations have since a long time back experienced an extension in costs and a lessening in effectiveness. Proprietors of these associations frequently envision that these additions in cost are a direct result of swelling and money related issues. Regardless, investigate shows that material organization has been an issue of stress in the advancement business. 40% of the time lost adjacent can be credited to repulsive organization, nonattendance of materials when required, poor unmistakable confirmation of materials and lacking stockpiling (Fewings, 2013).

Materials are essential in the operations in every industry since unavailability of materials can stop era. Besides, of materials when required can impact effectiveness, cause deferrals and possible suspension of activities until the required material is available. Detachment of materials is by all record by all account not the only point of view that can achieve issues. Over the top measures of materials could moreover make real issues to chiefs. Limit of materials can construct the costs of era and the total cost of any wander (Fisk and Reynolds, 2011). Exactly when there are obliged domains open for limit, the directors need to find diverse different choices to store the materials until they are required. Some of these decisions may require re-treatment of materials, which will construct the costs associated with them. Plans should be gotten a handle on to handle and store the materials enough when they are gotten. Remarkable thought should be given to the surge of materials once they are secured from suppliers (Aliverdi, Naeni and Salehipour, 2013). (Enshassi, Mohamed and Abushaban, 2009) concentrating on components influencing the execution of development undertakings in the

Gaza strip found that the most imperative elements concurred by the proprietors, advisors, and contractual workers as influencing the execution of development activities were material costs and quality and accessibility of assets.

2.1.6 Project Management Ability and Quality of Building Construction Project

The capability of the project manager in project usage will likewise influence the consummation of a project. For instance, viable observing and criticism by the project head, extend administrators specialized capacity, initiative nature of the project supervisor, compelling checking and input by the project partners. Power to take everyday choices by the project chiefs' group at site. Besides, the achievement of project relies on the viability of the project group in dealing with the procedure (Olatunji, 2010). This shows satisfactory limit of the project supervisor and the project group to guarantee appropriate assessment and examination of work done nearby.

As indicated by (Daft, 2010), extend administration is the fulfillment of hierarchical objectives in a powerful and effective way through arranging, sorting out, driving and controlling authoritative assets. (Usman, Kamau and Mireri, 2014) included that the developing many-sided quality of the building business calls for expanded adequacy in the arranging and control of activities. Be that as it may, development strategies utilize a scope of conventional to present day systems to address customer's issues in view of worldwide monetary advancement. As a consequence of populace blast and proceeded with interest for new sorts of structures, there is the requirement for expert specialists who are versed in project development frameworks.

(Wambugu, 2013) deduced in a study that lacking supervision and review of work in development extend prompted to improve in cases of poor workmanship and this prompted to postpone in project convenient finishing. This additionally prompts to project cost overwhelm and may result to project failure. Lacking site review is one of the variables recognized as creating project delays in opportune culminations as per (Jagboro and Aibinu, 2010). Mojahed in study completed in 2013 states that events of adjust are basically ascribed to inept specialists on account of inadequate working abilities and information of drawings or to awkward directors in light of absence of experience prompting to insufficient supervision.

Extend administration as noted by (Fapohunda and Stephenson, 2010) is the indispensable of the whole development extend capacities which incorporate coordination of subcontractors,

booking, cost control, work connection, charging, acquiring, exhausting, and different capacities identified with the project. In Construction Company, extend chief is responsible for these capacities. The utilization of project development systems is imperative in the development business, on the grounds that the coordination and utilization of the numerous sorts of work, abilities, materials, and types of gear which are utilized as a part of development require day by day use of legitimate project development procedures (Phua and Rowlinson, 2010).

The administrative framework is basically worried with basic leadership for arranging and controlling authoritative attempt. The administrative subsystem can be viewed as spreading over the whole association by relating the association to the earth, setting the objectives, creating complete vital, and operational arrangements, planning the structure and building up control forms (Kast and Rosenzweig, 2011). A necessary component of the administrative undertaking is authoritative basic leadership picking a general system, setting particular goals, outlining structures and procedures, selecting individuals, assigning duty, assessing comes about and starting changes.

(Sidwell, 2012) pushed that the level of project administration activities can be reflected in the range and kind of control instruments set up for the specific issue. Toward one side of the range will be a low control circumstance, where neither one of the professional's outline group, drawings, determinations, documentation nor standard type of agreement exist. Minor works may fall into this class. Then again a high control circumstance may exist if point by point documentation is directed through an arrangement of standard meeting, observing and reviews. (Sidwell, 2012) presumed that administrative control (classed as project administration activities) is a key component in making project progress, being altogether identified with all measures of accomplishment. (Ireland, 2013) discovered comparable results for administrative activity. (Rowlinson, 2008) inferred that abnormal state of authoritative capacity in the venture group prompts to decreased time overwhelms, which thus prompts to expanded fulfillment.

Expanded many-sided quality, instability, and time weight in development projects have expanded the requirement for participation among various project on-screen characters (Anvuur and Kumaraswamy, 2007). Generally, connections are, be that as it may, extremely focused and ill-disposed in the development business, which to an expansive degree is because of the standard acquisition methodology conceivably bringing on numerous issues in all phases of the purchasing procedure. Along these lines, keeping in mind the end goal to exploit

cooperation, obtainment systems are one key change zone and can contribute generously to venture achievement (Eriksson, 2007). Escalated correspondence is a focal calculate driving and coordinating individuals and taking choices to make a fruitful venture (Laufer *et al.*, 2009). In this manner, there is a need to build up a powerful data framework for development extends so that each privilege and concerned individual can get to and share thoughts. All the more extensively, shared extend vision is inconceivable when there is poor correspondence among venture partners. As individuals turn out to be better educated and more mindful of what is going on in their project, they will turn out to be more included and resolved to venture's advance, and as a result, turn out to be better roused (Clarke, 2009). Notwithstanding research extension and setting, participation is reliably credited to be an imperative determinant of development venture achievement (Phua and Rowlinson, 2010). Visit advance gatherings are, along these lines, inescapable. What is going on is imparted to the gatherings. At that point, remedial and preventive activities are auspicious connected to guarantee great project execution. Legitimate project observing and control framework is unthinkable without powerful advance gatherings. A project has an opportunity to be finished effectively when the project plans are overhauled frequently. Additionally, keeping in mind the end goal to guarantee extend achievement, the arrangements should be kept straightforward, with the right level of detail that can urge a project to be evaluated promptly (Clarke, 2009).

Group inclusion is another consider the correspondence segment. It has been observed to be a critical figure past studies (Awakul and Ogunlana, 2010). Huge scale development activities are typically laden with discussion. Along these lines, a strong and comprehension group is essential for smooth usage. This can't be accomplished unless the project data is shared satisfactorily. (Yeo, 2012) noticed that a huge framework extend needs support and comprehension from the group influenced by the project, particularly amid the development time frame. He included that overseeing open responses and conclusions and comprehension open states of mind are a basic part of the project development obligation. It is then key that the venture members ought to honestly share the project data and get distinctive open points of view with respect to their project.

2.3 Empirical Review of Literature

The empirical literature provides empirical evidences of factor affecting quality in construction projects. Additionally, at the end of this section the conceptual framework of this study is presented. In construction projects, there is a need for a framework for evaluating quality to assist construction clients in selecting quality-oriented organizations that will provide higher quality products and processes within budget and on schedule (Idrus and Sodangi, 2010; Dina *et al.* (2010). (Porter and Parker, 1993) stated that in managing quality, some organizations focus on specific areas such as training, leadership, and benchmarking while others take a holistic approach for quality factors.

(Haupt and Whiteman, 2004) have conducted a study in the USA through a literature review and a survey of contractors to identify factors (e.g. management commitment and involvement, customer satisfaction, planning, participative management style, continuous improvement measurement, rewards for quality contribution, and training of workers) affecting the operations of a construction jobsite.

(Pheng and Hong, 2005) have done a study in Singapore which involved the participation of project managers in the construction industry. A survey was used and the respondents generated eight factors and the relative importance of each factor was determined. For example, the first factor in order of priority was total commitment. Second, was strategic quality management, and followed by customer-driven service, eliminating rework, teamwork, and training, empowering and respecting people.

Furthermore, (Lam *et al.*, 2008) have explored the extent of quality in Hong Kong large-sized public building contractors. They concluded that the contractors should pay more attention first to the factors of strategic planning, human resources management, and leadership in order to attain the goal of continuous improvement then to the factors of process management, customer and market focus, measurement, and analysis and knowledge management.

(Abdulsalam, 2013) studied on factors affecting design quality in construction industry in Syria, briefs his research on factors affecting design quality in construction. Poor design is the main factor that reduces the overall performance of the construction project. The main factors are insufficient overall design time, method of selecting the designer, lowest price offer, lack of documentation and changes in client requirements.

(Saeed and Hasan, 2012) conducted a study to find the factors to building failures & defects in construction industry. The study found that failures & defects are common in construction

which rises cost, duration and resources. The identified factors are climatic conditions, location of building, construction materials, maintenance, faulty design and lack of supervision.

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

(Temesgen, 2007) on his study a Challenge for the Ethiopian Public Sector (Federal Level), identified three major problems related to unsuccessful projects in Ethiopian public sectors these are; resource problem shortage of adequately trained and skilled human, financial and material resources, Management problems such as weak sharing of responsibility during planning, weak follow-up, poor coordination and Technical problems which include loose linkages with sectoral policy and strategy, weak technical skill and poor project design are some of the identified problems contribute to project failure in Ethiopia public sectors.

Further (Birhanu and Daniel, 2014) in his study on his he identified that lack of effective supervision, communication, management of commitment, proper equipment's and materials available for use, quality assurance team lead the process, staff turnover, skilled turnover, Inefficient resource management and problems with contractors are some of the challenges he identified to the attainment of project quality.

Previous studies highlighted the factors affecting the quality of construction. Each study has contributed to identifying some factors affecting quality. However, there are few published works that comprehensively address the factors specifically affecting the quality of construction in different parts of the world. Researchers still differ in their perceptions as to what should be emphasized most among the different factors affecting quality. A detailed analysis of the frameworks is carried out and presented in Table 2.1.

Table 2.1: Quality Problems Factors

Lack of contractor supervision	(Arditi&Gunaydin, 1998; Wong & Fung, 1999)
Poor relationship and partnering among project participants	(Arditi&Gunaydin, 1998; Jha&Iyer, 2006; Tang <i>et al.</i> , 2009)
Reduced Subcontractor responsibility	(Leonard, 2008; Pheng& Wei, 1996; Wong & Fung, 1999)
Inappropriate method of contractor selecting	(Arditi&Gunaydin, 1998; Pheng& Wei, 1996)

Poor quality procedure and department	(Chan & Tarn, 2000; Moody, 2005; Saraph, <i>et al.</i> , 1989)
Lack of auditing system	(Pheng& Wei, 1996; Samuels, 1994)
Poor Training system	(Arditi&Gunaydin, 1998)
Low quality continues improvement	(Joaquin <i>et al.</i> , 2008; Pheng& Wei, 1996)
Lack of process improvement	(Pheng& Wei, 1996; Saraph, <i>et al.</i> , 1989)
Lack of Management commitment	(Hiyassat, 2000; Marosszeky, <i>et al.</i> , 2002; Yung & Yip, 2010)
Low effective project management system	(Anderson, 1992; Chan & Tarn, 2000; Yung & Yip, 2010)
Bureaucracy	(Marosszeky, <i>et al.</i> , 2002)
Supplier impact	(Arditi&Gunaydin, 1997; Wong & Fung, 1999)
Low quality drawing and specification	(Arditi&Gunaydin, 1998; Pheng& Wei, 1996)
Design complexity	(Chan & Tarn, 2000)
Poor performance of quality tools	(Arditi&Gunaydin, 1997; Leonard, 2008)
Difficult application of quality system	(Mohammed & Abdullah, 2006; Serpell, 1999)
Project size and complexity	(Chan & Tam, 2000; Jha&Iyer, 2006)
Material/Equipment specification	(Hiyassat, 2000; Pheng& Wee, 2001)
Project Environment	(Chan & Tam, 2000)
Low quality and poor availability of resources	(Joaquin, <i>et al.</i> , 2008; Yung & Yip, 2010)
Lack of motivation	(Marosszeky, <i>et al.</i> , 2002; Pheng& Wee, 2001; Serpell, 1999)

Source: (Adenuga, 2013)

In general, the problems identified by different researchers are almost similar even though there is variation due to their practical context of the projects. However, none of these studies has focused on quality of construction projects in case of construction industries in Ethiopia context. This creates a research gap that this study seeks to bridge under Ethiopia current quality standard problems in the areas of construction projects under construction industries. Hence, in order to bridge the gap, the study benchmark the above influencing factors to achieve its specific objectives under Ethiopia construction projects condition, and categorized them in four categories accordingly for the purpose of the study, which are stakeholder engagement, project funding, construction materials, and project management.

2.4 Conceptual Framework of the Study

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. The conceptual framework in this study in order to achieve its specific objectives which considered stakeholder engagement,

project funding, construction materials, and project management ability as independent variables against quality of construction projects which is a dependent variable, and in addition project distinctive has taken as a moderating variable for the given research purpose.

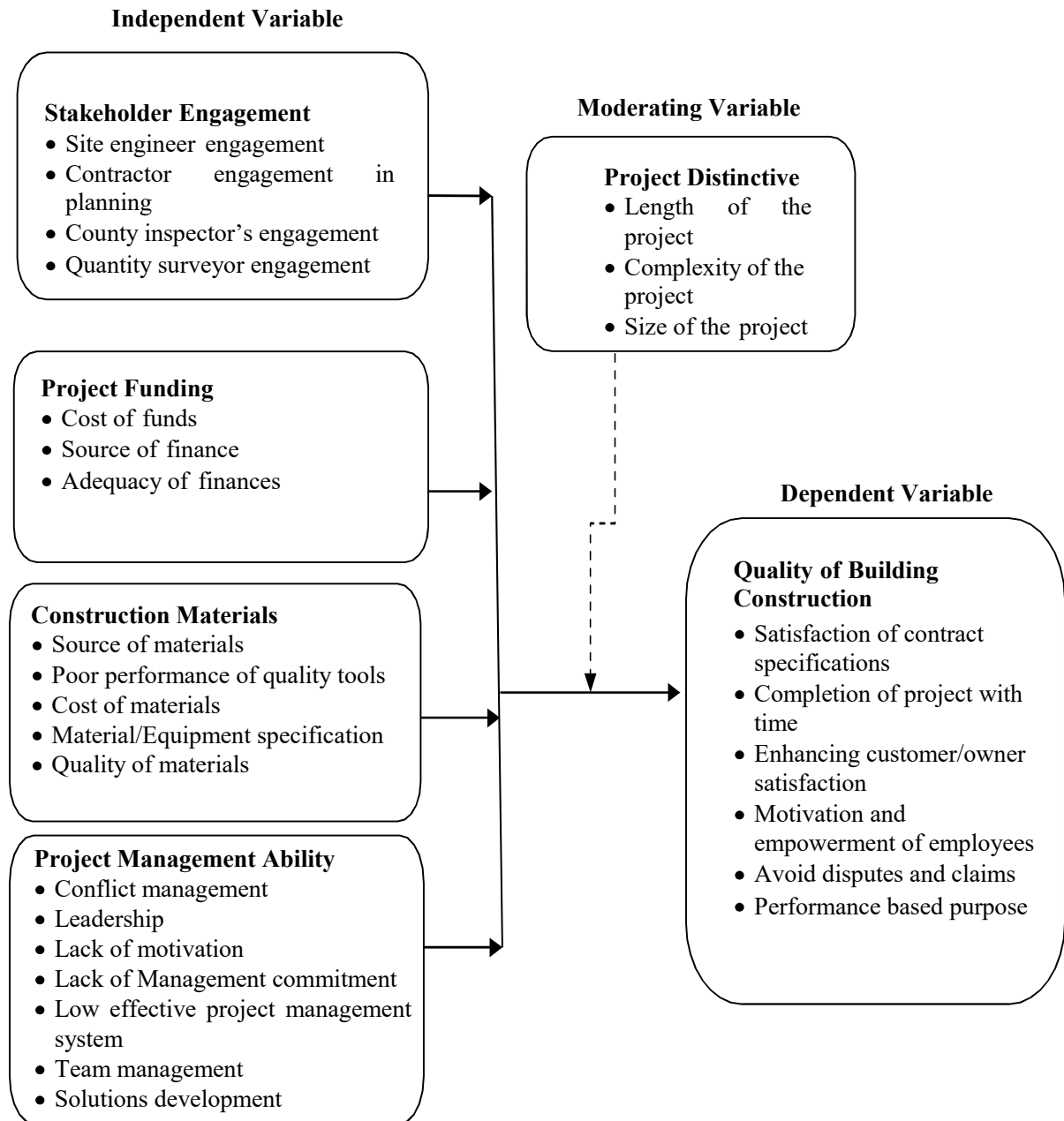


Figure 2.1: Conceptual Frame Work (adopted and modified from Adenuga, 2013)

CHAPTER THREE

METHODS OF THE STUDY

3.1 Introduction

The main purpose of the research methodology is to explain how the research is accomplished, what knowledge is required, what information is needed and how information is collected. Research methodology consists of research approach, sample design-sampling technique, sample size, source and instruments of data collection, methods of data analysis, ethical issues, validity and reliability of the study.

3.2 Research Approach

The study gathered relevant and appropriate information on the role of monitoring and evaluation for success. The study employed both quantitative and qualitative methods to collect primary and secondary data. Relevant data and information was gathered from top management of construction companies, contractors, country inspectors, national government officials and project owner's. The primary and secondary sources helped to triangulate data from different perspectives regarding the research problem. The secondary sources of information used to provide the conceptual framework and acquire a general picture of the problem.

3.3 Research Design

The research design was adopted because it describes the state of affairs, as it exists at present in the study (Kothari, 2010). The availability of time, cost as well as the skill of the researcher was taken into consideration for deciding the research design and how to get sufficient information for the research purpose and hence only individuals who have in depth knowledge of the research topics were contacted. The scientific way of dealing with the sample design and operational design were taken into consideration while dealing the research design and procedure. The study intends to apply this design to evaluate the relationship between design factors and quality of construction projects for the selected area. This design is very useful in studying the inter-relations between the variables already mentioned in the conceptual framework. A survey approach is appropriate because the population of the study is in different geographical regions within selected building construction industries in Addis Ababa, Ethiopia. A total of 310 respondents were identified with the required knowledge and experience in the

area of monitoring and evaluation and project management considering the independent, moderating and dependent variables. Therefore, the research was designed in both descriptive and explanatory features of study. The descriptive study allowed the researcher to describe those data and helps to know the event that was taken place whereas explanatory study to examine the relationships between variables.

3.4 Sources of Data

3.3.1 Primary Data

The data required to validate the proposed hypotheses and carry out empirical examination for this study are specifically concerned with factors affecting quality of construction projects: in the case of selected building construction industries. However, there is little existing information and data on factors affecting quality of construction projects: in the case of selected building construction industries research. Furthermore, in empirical studies, data are often obtained directly by the researcher for a particular research project (Saunders *et al.*, 2009). This is commonly referred to as primary data collection, where original primary data are obtained directly by the researcher through various methods such as questionnaires, interviews and direct observation (Bryman and Bell, 2015).

Generally, the use of primary data is suggested when the required data is not available to the researcher from published sources (Bryman and Bell, 2015). Most of the available secondary data comprised general information on factors affecting quality of construction projects in building construction industries, which were considered not applicable for this study. This necessitated a need to collect primary data for this study which furnish the paper with the appropriate and up to date information required to answer the research questions. Therefore, based on the discussion above, this study suggests the use of primary data. Primary data collection is always associated with selecting appropriate sampling techniques, as it is not possible to collect the required original data from an entire population (Saunders *et al.*, 2009). In general; the required data for this study was collected using primary data collection methods. Primary data was collected from top management of construction companies, contractors, country inspectors, national government officials and project owner's by using a five point Likert scales self-administered questionnaire that consist of closed ended questions that was designed to collect responses for qualitative and quantitative analysis respectively.

3.5 Data Gathering Tools/Instruments

A survey questionnaire was prepared and administered to distributed to top management of construction companies, contractors, country inspectors, national government officials and project owner's. The questionnaire contains mainly closed ended and few open ended questions. It is an appropriate instrument to obtain variety opinions within a relatively short period of time. The questions rating was done depending on the type of questions and choices given. Since the media of communication of the international organization is English; the questionnaire was constructed in English. The questionnaire consisted of different parts mainly focusing on the factors affecting quality of building construction projects which helped the researcher to see how to identify factors affecting quality of construction projects: in case of selected construction industries in Addis Ababa, Ethiopia? and what actually helps the research to be successful. The information obtained through displayed data collection efficiency, quality and consistency across all the collected questionnaires. The response was kept confidential. Thus, the researcher triangulated the findings with the qualitative and quantitative data collected through questionnaire.

3.6 Population and Sample

A researcher draws a sample from a larger pool of cases, or elements. A sampling element is the unit of analysis or case in a population (Newman, 2007). Random assignment involves assigning participants to groups within a research study in such a way that each participant has an equal probability of being assigned to any of the groups within the study (Kazdin, 1992). In stratified sampling, a researcher first divides the population into sub populations (strata) on the basis of supplementary information. After dividing the population in to strata, the researcher draws a random sample from each sub population. He or she can sample randomly within strata using simple random sampling technique (Newman, 2007). Sample size determination is an important element in any survey research, although it is a difficult one (Adams *et al.*, 2007). There are different sample size determination techniques, for this paper the method developed by (Carvalho, 1984) is favored and directly referred as quoted on (Malhorta Narsh K., 2007) as shown in the table below.

Table 3.1: Carvalho's Sample Size Determination

Population Size	Small	Medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3201-10000	80	200	315
10001-35000	125	315	500
35001-150000	200	500	800

Source: (Carvalho ,1984) as quoted by as quoted on (Malhorta Narsh K., 2007)

The simple random sample is both the easiest random sample to understand and the one on which other types are modeled. In simple random sampling, a researcher develops an accurate sampling frame, selects elements from the sampling frame according to a mathematically random procedure, then locates the exact element that was selected for inclusion in the sample. After numbering all elements in a sampling frame a researcher uses a list of random numbers to decide which elements to select (Newman, 2007).

Therefore, for the purpose of this study, the researcher used probability sampling particularly stratified sampling and simple random sampling technique since the total population of the study is large and heterogeneous in type stratified sampling and simple random sampling technique was preferred. These methods ensure that all the individuals in the target population have an equal chance of being included in the sample which help to eliminate the biasness. The target population for the study was classified into five strata based on the departments and section in the industries. Then the samples are selected from each stratum according to their proportion to the total population. Since the information required for the study needs different people who have knowledge and awareness about factors affecting quality of building construction projects on the industries, stratified sampling technique is used to have the right proportion of people from every concerned department or section. From each stratum, representative samples were drawn through simple random sampling technique. The departments in the selected construction industries considered as strata, from which data were

collected are: top management of construction companies, contractors, country inspectors, national government officials and project owners.

Table3.2: Sample Size Determination for the study from staff composition of building construction industries in Addis Ababa, Ethiopia under the case study.

Department	Total Population of Each Stratum	Target Population of Each Stratum	Sample Size of Each Stratum
Top management	164	164	50
Contractors	153	153	50
Country Inspectors	294	294	80
National government officials	174	174	50
Project owners	283	283	80
Total	1068	1068	310

Source: Building Construction Industries Human Resource Department

However, as we can see in the table above the targeted population (Top management, Contractors, and National government officials) in each stratum was found in the given range (i.e. the range 151-280), therefore it's considered as large based on Carvalho's Sample Size determination. The targeted population (Country inspectors & Project owners) in each stratum was found in the given range (i.e. the range 281-500) which are also considered as large based on Carvalho's Sample Size determination. Therefore, among the total population, based on Carvalho's and census Sample Size method determination, and in order to make the study manageable 310 targeted populations were taken as a sample size.

3.7 Methods of Data Analysis

The data collected through questionnaire presented in table form and descriptive statistics is employed. After making the necessary coding, to analyze the usable data collected from respondents Statistical Package for Social Sciences (SPSS) is used. Both descriptive and inferential are applied in order to come up with a better result. Descriptive statistics is used to describe a set of data in terms of its frequency of occurrence, its central tendency, and its dispersion. Regression analysis, correlation analysis and reliability test examined through employing inferential statistics.

The regression model for the proposed conceptual frame was:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6(X_1X_2X_3X_4X_5) + \varepsilon$$

Where:

Y = Quality of Building Construction Projects

β_0 = Constant Term; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and β_6 = Beta coefficients;

X_1 = Stakeholder Engagement; X_2 = Project Funding; X_3 = Construction Materials; X_4 = Project Management Ability; X_5 = Project Distinctive

ε = Error Term

3.8 Ethical Considerations

Research ethics is deemed a crucial element in conducting a research project within social science research. It is broadly referred to as the appropriateness of researchers' behavior in connection with the rights of those who are the subjects of the research project (Saunders *et al.*, 2009). The ethical issues of voluntary participation, informed consent, risk of harm, confidentiality and anonymity are central and should be considered by researchers when conducting any research project within the social science context (Bryman and Bell, 2015).

The research work followed St. Mary's University ethical guidelines and considered the main ethical issues of the principles of voluntary participation, the requirements of informed consent, ethical standards concerning risk of harm for participants, confidentiality of the information provided by respondents and principles of anonymity that ensure that participants would remain anonymous throughout the study. For example, an informed consent statement was provided at the beginning of the questionnaire, informing participants that their consent would be assumed by their completion of the survey.

Furthermore, to ensure the study's research ethics, an ethical review application would be completed and submitted to the research ethics committees along with a sample of the questionnaire. The study's ethical application would be reviewed by the College of Graduate Studies Ethical Review Committee of the St. Mary's University, and granted full ethical approval prior to the pre-survey fieldwork and the main survey.

3.9 Reliability and Validity

3.8.1 Assessing Reliability

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure while reliability has to do with the accuracy and precision of a measurement procedure. A measuring instrument is reliable if it provides consistent results. As multiple items in all constructs were used, the internal consistency/reliabilities of five building blocks of independent variables; stakeholder engagement, project funding, construction materials, and project management ability, a moderating variable; project distinctive, and dependent variable; quality of building construction projects were assessed with Cronbach's Alpha and the reliability values for all constructs are confirmed as greater than 0.7, which are considered ideal (Pallant, 2005). Hence, the findings indicated all constructs considered in the questioner for this study was reliable. The following table shows the summary of reliabilities of all variables under the questioner.

Table 3.2: Reliability Statistics

VARIABLES	NUMBER OF ITEMS	CRONBACH'S ALPHA
Stakeholder Engagement	4	0.722
Project Funding	3	0.865
Construction Materials	5	0.931
Project Management Ability	7	0.733
Project Distinctive	3	0.834
Quality of Building Construction Projects	6	0.872

Source: Questionnaire Survey, 2020

3.8.2 Analysis of Validity

Malhotra (2010) mentioned about three types of validity in his study: content validity, predictive validity, and construct validity. This study addressed content validity through the review of literature and adapting instruments used in previous research.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

As discussed in previous chapter, this study attempted to factors affecting quality of construction projects: in the case of selected building construction industries in Addis Ababa, Ethiopia. Therefore, the findings of the study are presented and discussed in this chapter. The questionnaire was developed in two different five Likert scales for different areas of investigations which are ranging from five to one independently; where the first Likert scales represented by 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. In order to investigate factors affecting quality of construction projects: in the case of selected building construction industries in Addis Ababa, Ethiopia, Correlation and regression analysis were conducted for Likert scale typed questionnaire. A total of 310 questionnaires were distributed to the selected strata and 273 (88%) questionnaire was obtained valid and used for analysis. The collected data were presented and analyzed using SPSS (version 20) statistical software. The study used correlation analysis, specifically Pearson correlation to measure the degree of association between different variables under consideration. Regression Analysis was also used to test the effect of independent variable on dependent variable.

4.1 Response Rate

A total of 310 questionnaires were distributed to employees and 273 (88%) questionnaire was obtained. The remaining 11 questionnaires were not collected due to unwillingness to provide information and some respondents were in absence of leave. Based on these, the response rate is 88%.

4.2 Background Information

Table 4.1: Background Information

Demographic Profile (N=273)		Frequency	Percent
Designation in the Organization	Top management	43	15.8
	Contractor	39	14.3
	Country inspector	79	28.9
	National government official	34	12.5

	Project owner	78	28.6
Relationship With the Project	Top management	43	15.8
	Contractor	39	14.3
	Country inspector	79	28.9
	National government official	34	12.5
	Project owner	78	28.6
Level of Education	Post Graduate	26	9.5
	Undergraduate	61	22.3
	Diploma	111	40.7
	Certificate	59	21.6
	Any other (specify)	16	5.9
Years of Experience In Industry	1 to 5 years	119	43.6
	5 to 10years	76	27.8
	11 to 15 years	40	14.7
	16 to 20 years	28	10.3
	21 years and above	10	3.7

Source: (SPSS Output, 2020)

The analysis of the respondent's profile in terms of their designation in the organization, relationship with the project, level of education and years of experience in industry in line with Table 4.1 is presented as follows:

Designation in the Organization:

The researcher sought to determine the designation of respondents in the organization. From the findings, 43 respondents (15.8%) were top management, 39 respondents (14.3%) were contractor, 79 respondents (28.9%) were country inspector, 34 respondents (12.5%) were national government official, and 78 respondents (28.6%) were project owner. This implies the fact that all the respondents are directly involved in the building construction projects of their industry and hence, according to the response, the respondents provide relevant and reliable information needed that can be considered as reliable and relevant for the study.

Relationship with the Project:

From the findings, the respondents were top management (15.8%), contractor (14.3%), country inspector (28.9%), national government official (12.5%), and project owner (28.6%). This shows that majority of the respondents were almost the same degree of involvement for the study, therefore they were well versed with relevant information on building construction projects which was needed for the study. Hence, their information can be considered as reliable and relevant for the study.

Level of Education:

From the total respondents, 26 respondents (9.5%) have Post Graduate, 61 respondents (22.3%) have Undergraduate, 111 respondents (40.7%) have Diploma, 59 respondents (21.6%) have Certificate and the remaining 16 respondents (5.9%) are other degree holders. According to the response, the respondents provide relevant and reliable information needed for the study and they are fit in line with the response of the questionnaire.

Years of Experience in Industry:

From the total respondents, 119 respondents (43.6%) have had 1 to 5 years of stay in the industry, 76 respondents (27.8%) 5 to 10 years of stay in the industry, 40 respondents (14.7%) 11 to 15 years of stay in the industry, 28 respondents (10.3%) 16 to 20 years of stay in the industry, 10 respondents (3.7%) 21 years and above years of stay in the industry. The findings imply the fact that most of the respondents have sufficient knowledge and experience about their firm and the subject matter of the study.

4.3 Stakeholder Engagement

The study in this section sought information about stakeholder engagement in the selected building construction industries. With regard to factor affecting building construction industries in Addis Ababa, Ethiopia, the study requested respondents to rate the extent to which stakeholder engagement affects quality of building construction projects inside their industry. Table 4.2 presents the findings.

Table 4.2: Stakeholder Engagement

Item	Mean	Std. Deviation
Site engineer engagement	3.66	1.441
Contractor engagement in planning	3.61	1.456
County inspector's engagement	3.53	1.445
Quantity surveyor engagement	4.23	.923
Mean of Mean	3.76	

Source: (SPSS Output, 2020)

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on the above table 4.2. A mean (M) score of 0 to 1.5 means that stakeholder engagement affects quality of

building construction project at very low extent, between 1.50 to 2.50 means that stakeholder engagement affects quality of building construction project at low extent, between 2.50 to 3.50 means the stakeholder engagement affects quality of building construction project at moderate extent, between 3.50-4.50 means that stakeholder engagement affects quality of building construction project at great extent and a mean above 4.50 means the stakeholder engagement affects quality of building construction project in a very great extent.

Based on the findings on Table 4.2, all of the items for the stakeholder engagement that affects quality of building construction project scores as shown in the total mean of mean (3.76) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that the stakeholder engagement affects quality of building construction project is at the level of great extent.

As per the table 4.2, the results show that the building construction industries under the study have taken into consideration stakeholder engagement as the factor for the quality of building construction projects. Thus, these finding can be useful for project industries to enhance the quality of building construction projects in Ethiopia. The final result for the study is similar to (Basu, 2014) who argued that the connections between various process operators in the building development division can be directed or restricted by contracts, for instance between the customer and the manufacturer. And it's also conforms to (Seddon, 2008) who claimed that stakeholder administration concentrates on comprehension stakeholder' needs and desires, tending to issues as they happen, overseeing clashing interests and encouraging suitable stakeholder engagement in venture choices and exercises.

In general, based on the above results it was found that Ethiopian construction industries stakeholder engagement is a challenge and factor for quality of building construction projects. This is evidenced that Ethiopian construction industries under the case study has challenges in practicing stakeholder engagement standards in the project areas. Thus the study concludes that building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the possible solutions to practice stakeholder engagement standards for building construction projects in order to enhance quality of building construction projects.

4.4 Project Funding

The study in this section sought information about project funding in the selected building construction industries. With regard to factor affecting building construction industries in Addis Ababa, Ethiopia, the study requested respondents to rate the extent to which project funding affects quality of building construction projects inside their industry.

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on table 4.3. A mean (M) score of 0 to 1.5 means that project funding affects quality of building construction project at very low extent, between 1.50 to 2.50 means that project funding affects quality of building construction project at low extent, between 2.50 to 3.50 means the project funding affects quality of building construction project at moderate extent, between 3.50-4.50 means that project funding affects quality of building construction project at great extent and a mean above 4.50 means the project funding affects quality of building construction project in a very great extent. Table 4.3 presents the findings.

Table 4.3: Project Funding

Item	Mean	Std. Deviation
Cost of funds	4.08	1.274
Source of finance	4.08	1.261
Adequacy of finances	3.96	1.190
Mean of Mean	4.04	

Source: (SPSS Output, 2020)

Based on the findings on Table 4.3, all of the items for the project funding that affects quality of building construction project scores as shown in the total mean of mean (4.08) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that the project funding affects quality of building construction project is at the level of great extent.

As per the table 4.3, the results show that the building construction industries under the study have taken into consideration project funding as the factor for the quality of building construction projects. Thus, these finding can be useful for project industries to enhance the quality of building construction projects, and helps to reduce challenges they faced in the area.

The overall results of this part of the study correlate with (Budi *et al.*, 2014) who claims that as rising of funds to finance an economically separable capital investment project, which the providers of funds look essentially to the income from the project as the wellspring of assets to benefit their advances and give the profits of value put resources into the project. The study further found that cost of funds was greatly influence quality of construction. These were in line (Olatunji, 2010) who states that groups in the development part work in a globalized advertise, with vast project groups and jointed tasks with universal organizations in which they show social contrasts, proficient morals and diverse thoughts regarding how to direct business. Further it was also revealed that adequacy of finances greatly influences quality of construction. This concurs with (Matesehe, 2013) who characterized extend funding as funding a specific monetary unit in which a bank is fulfilled to look at first to the income and profit of that monetary unit as the wellspring of assets from which an advance will be reimbursed and to the benefits of the financial unit as the security for the advance.

In general, based on the above comparative results it was found that Ethiopian construction industries, the parameter project funding is a challenge and factor for quality of building construction projects. This is evidenced that Ethiopian construction industries under the case study has challenges in project funding in the building construction project areas. Thus, the study concludes that building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the possible solutions to the parameter project funding for building construction projects in order to improve quality of building construction projects.

4.5 Construction Materials

The study in this section sought information about construction materials in the selected building construction industries. With regard to factor affecting building construction industries in Addis Ababa, Ethiopia, the study requested respondents to rate the extent to which construction materials affect quality of building construction projects inside their industry. Table 4.4 presents the findings.

Table 4.4: Construction Materials

Item	Mean	Std. Deviation
Source of materials	3.98	1.458
Poor performance of quality tools	4.01	1.406
Cost of materials	3.88	1.407

Material/Equipment specification	3.92	1.311
Quality of materials	3.79	1.358
Mean of Mean	3.92	

Source: (SPSS Output, 2020)

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on the above table 4.4. A mean (M) score of 0 to 1.5 means that construction materials affect quality of building construction project at very low extent, between 1.50 to 2.50 means that construction materials affects quality of building construction project at low extent, between 2.50 to 3.50 means the construction materials affect quality of building construction project at moderate extent, between 3.50-4.50 means that construction materials affect quality of building construction project at great extent and a mean above 4.50 means the construction materials affects quality of building construction project in a very great extent.

Based on the findings on Table 4.4, all of the items for the construction materials that affect quality of building construction project scores as shown in the total mean of mean (3.92) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that the construction materials affect quality of building construction project is at the level of great extent.

As per the table 4.4, the results show that the building construction industries under the study have taken into consideration construction materials as the factor for the quality of building construction projects. Thus, these finding can be useful for project industries to enhance the quality of building construction projects. The result was similar to (Aliverdi, Naeni and Salehipour, 2013) who claims that materials influence project costs and the quality of construction. The study further found that quality of materials greatly influences quality of a building construction and that cost of materials greatly influences the quality of a building construction. This conformed to (Enshassi, Mohamed and Abushaban, 2009) who concentrating on components influencing the execution of development undertakings in the Gaza strip found that the most imperative elements concurred by the proprietors, advisors, and contractual workers as influencing the execution of development activities were material cost, quality and accessibility of assets. The results also showed that source of materials lightly

influence the quality of construction projects. These were similar to (Fisk and Reynolds, 2011) who claims that limit of materials can construct the costs of era and the total cost of any wander. In summary, based on the above comparative results it was found that Ethiopian construction industries, the parameter construction materials are a challenge and factor for quality of building construction projects. This is evidenced that Ethiopian construction industries under the case study has challenges in construction materials in the building construction project areas. Thus, the study concludes that building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the possible solutions to the parameter construction materials for building construction projects in order to improve quality of building construction projects.

4.6 Project Management Ability

The study in this section sought information about project management ability in the selected building construction industries. With regard to factor affecting building construction industries in Addis Ababa, Ethiopia, the study requested respondents to rate the extent to which project funding affects quality of building construction projects inside their industry.

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on table 4.5. A mean (M) score of 0 to 1.5 means that project management ability affects quality of building construction project at very low extent, between 1.50 to 2.50 means that project management ability affects quality of building construction project at low extent, between 2.50 to 3.50 means the project management ability affects quality of building construction project at moderate extent, between 3.50-4.50 means that project management ability affects quality of building construction project at great extent and a mean above 4.50 means the project management ability affects quality of building construction project in a very great extent. Table 4.5 presents the findings.

Table 4.5: Project Management Ability

Item	Mean	Std. Deviation
Conflict management	3.86	1.435

Leadership	3.84	1.377
Lack of Management commitment	3.86	1.311
Lack of motivation	3.70	1.360
Low effective project management system	4.22	.894
Team management	3.58	1.132
Solutions development	3.81	1.524
Mean of Mean	3.84	

Source: (SPSS Output, 2020)

According to the findings on Table 4.5, all of the items for the project management ability that affects quality of building construction project scores as shown in the total mean of mean (3.84) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that the project management ability affects quality of building construction project is at the level of great extent.

As per the table 4.5, the results show that the building construction industries under the study have taken into consideration project management ability as the factor for the quality of building construction projects. Thus, these finding can be useful for project industries to enhance the quality of building construction projects. which was similar to (Usman, Kamau and Mireri, 2014) who included that the developing many sided quality of the building business calls for expanded adequacy in the arranging and control of activities. The study also revealed that conflict management influence quality of building construction project and that team management lightly influence quality of building construction project. (Armstrong, 2010) concur by expressing that investigation and workmanship gauges are very critical to accomplish quality.

In summary, based on the above comparative results it was found that Ethiopian construction industries, project management ability is a challenge and factor for quality of building construction projects. This is evidenced that Ethiopian construction industries under the case study has challenges in project management ability in the building construction project areas. Thus, the study concludes that building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the possible solutions to the project management ability for building construction projects in order to enhance quality of building construction projects.

4.7 Project Distinctive

The study in this section sought information about project distinctive in the selected building construction industries. With regard to factor affecting building construction industries in Addis Ababa, Ethiopia, the study requested respondents to rate the extent to which project distinctive affect quality of building construction projects inside their industry. Table 4.6 presents the findings.

Table 4.6: Project Distinctive

Item	Mean	Std. Deviation
Length of the project	3.86	1.419
Complexity of the project	3.60	1.413
Size of the project	4.02	1.263
Mean of Mean	3.83	

Source: (SPSS Output, 2020)

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on the above table 4.6. A mean (M) score of 0 to 1.5 means that project distinctive affect quality of building construction project at very low extent, between 1.50 to 2.50 means that project distinctive affects quality of building construction project at low extent, between 2.50 to 3.50 means the project distinctive affect quality of building construction project at moderate extent, between 3.50-4.50 means that project distinctive affect quality of building construction project at great extent and a mean above 4.50 means the project distinctive affects quality of building construction project in a very great extent.

According to the responses of the respondents based on the findings on Table 4.6, all of the items for the project distinctive that affect quality of building construction project scores as shown in the total mean of mean (3.83) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that the project distinctive affect quality of building construction project is at the level of great extent.

As per the table 4.6, the results show that the building construction industries under the study have taken into consideration project distinctive as the factor for the quality of building construction projects. Thus, these finding can be useful for project industries to enhance the

quality of building construction projects. This finding is therefore consistent with (Muller et al., 2012) that investigated the moderating effect of project complexity, size and length on the relationship between the leadership competence of project managers and their success in projects. Results from this study showed that emotional and managerial leadership competences are correlated with project success and quality. (Kennedy *et al.*, 2011) concur the findings for this part by conducted virtual experiments to examine team communication and performance when teams work under varying types and levels of project overall characteristics and complexity, and they indicated that project characteristics overall complexity influences the communication performance relationship.

In summary, based on the above comparative results it was found that Ethiopian construction industries, project distinctive is a challenge and factor for quality of building construction projects. This is evidenced that Ethiopian construction industries under the case study has challenges in distinctive in the building construction project areas. Thus, the study concludes that building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the possible solutions to the distinctive for building construction projects in order to improve quality of building construction projects.

4.8 Determinates of Quality of Building Construction Projects

The study in this section sought information about quality of building construction projects in a general format. With regard to quality of building construction projects, the study requested respondents to rate to what extent of quality of building construction projects could be in higher level in their respective construction industry by taken into consideration the items mentioned under the table.

For this part also, the research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 1 = Very Low Extent, 2= Low Extent, 3 = Moderate Extent, 4= Great Extent, and 5 = Very Great Extent. Based on the response of the respondents Mean computed on table 4.7 below. A mean (M) score of 0 to 1.5 means that quality of building construction projects in their case were improved at very low extent by using the items mentioned under table 4.7, between 1.50 to 2.50 means that quality of building construction projects in their case were improved at low extent by using the items, between 2.50 to 3.50 means quality of building construction projects in their case were improved at moderate extent

by using the items, between 3.50-4.50 means that quality of building construction projects in their case were improved at great extent by using the mentioned items and a mean above 4.50 means quality of building construction projects in their case were improved at very great extent by using the mentioned items. Table 4.7 presents the findings.

Table 4.7: Quality of Building Construction Projects

Item	Mean	Std. Deviation
Satisfaction of contract specifications	3.71	1.581
Completion of project with time	3.83	1.499
Enhancing customer/owner satisfaction	3.78	1.463
Motivation and empowerment of employees	3.71	1.377
Avoid disputes and claims	3.60	1.427
Performance based purpose	4.26	.868
Mean of Mean	3.82	

Source: (SPSS Output, 2020)

Based on the findings on Table 4.7, all of the items which are considered for quality of building construction projects in the case study scores as shown in the total mean of mean (3.82) which is in between 3.50 - 4.50 that imply the respondents agreed to the fact that by using the items mentioned on table 4.7, quality of building construction projects in their industry can be improved at the level of great extent. Thus, these finding can be useful for project industries to enhance the quality of building construction projects by taken into consideration the mentioned items. This finding is therefore consistent with (Tan, C. K., & Abdul-Rahman H., 2005) that emphasizes on time delivery of projects and meeting of quality standards. The final result for this part also supported by (Raji Al-Ani *et al.*, 2011), who recommended a Quality Management System (QMS) for Construction Site for increase in quality levels in projects, and communication between staff in various Management. The research explained in construction industry there are two main reasons for lesser quality is not usage of building material and second one is poor techniques applied in construction. He stated that there is a misunderstanding to understand quality management.

In general, based on the above comparative results it was found that Ethiopian construction industries, there is a challenges in practicing quality of building construction projects inside building construction projects under the case study. This is evidenced that Ethiopian construction industries under the case study has challenges in building construction project areas to come up with quality building construction projects. Thus, the study concludes that

building construction industries under case study in Addis Ababa, Ethiopia should have to focus on the collective outcomes of the mentioned items inside quality of building construction projects to the project in order to enhance quality of building construction projects at the required manner.

4.8.1 Correlation Analysis

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong relationship between the variables being correlated whereas values closer to 0 indicates that there is little or no linear relationship. As described by (Pallant 2005), the correlation is a commonly used measure of the size of an effect: values of ± 0.1 represent a small effect, ± 0.3 is a medium effect and ± 0.5 is a large effect.

In this section, correlation analysis conducted in the light of each research objectives and conceptual frame works developed. The relationship between dependent variable (quality of building construction projects), independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) was investigated using correlation analysis. This provided correlation Coefficients which indicated the strength and direction of relationship. The p-value also indicated the probability of this relationship's significance.

4.8.1.1 Correlation Matrix between dependent variable, independent variables and moderating variable

Table 4.8: Correlation Matrix between dependent variable, independent variables and moderating variable

		Quality of Building Construction Projects	Stakeholder Engagement	Project Funding	Construction Materials	Project Management Ability	Project Distinctive
Quality of Building Construction Projects	Pearson Correlation	1	.788**	.697**	.705**	.828**	.659**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	273	273	273	273	273	273
Stakeholder Engagement	Pearson Correlation	.788**	1	.546**	.522**	.656**	.485**

	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	273	273	273	273	273	273
Project Funding	Pearson Correlation	.697**	.546**	1	.446**	.654**	.617**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	273	273	273	273	273	273
Construction Materials	Pearson Correlation	.705**	.522**	.446**	1	.643**	.456**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	273	273	273	273	273	273
Project Management Ability	Pearson Correlation	.828**	.656**	.654**	.643**	1	.584**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	273	273	273	273	273	273
Project Distinctive	Pearson Correlation	.659**	.485**	.617**	.456**	.584**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	273	273	273	273	273	273
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: (SPSS Output, 2020)

The correlation Matrix between dependent variable (quality of construction projects), independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) was computed in the above table 4.8. The result of correlation matrix dependent variable (quality of building construction projects) against independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) is analyzed as follow.

As indicated on table 4.8, the Pearson correlation test was conducted between dependent variable against independent variables and moderating variable. And on the given study the results show that there is significant positive correlation at the level of 0.01 between a dependent variable (quality of construction projects) against independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive). In other words, stakeholder engagement, project funding, construction materials, and project management ability, and project distinctive

has positive relationship with correlation coefficient of 0.788** ($r=0.788$), 0.697** ($r=0.697$), 0.705** ($r=0.705$), 0.828** ($r=0.828$), and 0.659** ($r=0.659$) respectively, and strongly significant significance at the value of 0.01 level with dependent variable (quality of construction projects).

Furthermore, the research findings of the above empirical investigation on table 4.8 are generally consistent with majority of prior studies and stand with more recent studies reporting similar results. This consolidates the research findings and dimensions reaching relatively conclusive results on the topic of the factors affecting quality of construction projects: in the case of selected building construction industries in Addis Ababa, Ethiopia. In addition, the new research discoveries and research directions attained with in the set of empirical observation bridge the mixed theoretical views of factors affecting quality of construction projects within the existing knowledge, giving rise to some good insights.

In general, the overall empirical findings of this research investigation from the statistical results of correlation matrix indicates that the correlation between dependent variable (quality of building construction projects) against independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) have a positive impact and most largely and significantly associated.

4.8.2 Regression Analysis

This regression analysis is conducted to know by how much the independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) explains the dependent variable (quality of construction projects). the regression was conducted based on the conceptual framework that is between dependent variable (quality of building construction projects) against independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive). The results of the regression analysis are presented as follows.

4.8.2.1 Autocorrelation Test

Table 4.9 shows that the multiple linear regression model summary and overall fit statistics. From the table its find that the adjusted R^2 of the proposed model is 0.850 with $R^2 = 0.853$. this means that the linear regression explains 85.3 % of the variance in the data. The Durbin-Watson

$d = 2.085$, which is between the two critical values of $1.5 < d < 2.5$ (Bryman, A. and Bell, E., 2015). Therefore, in the multiple linear regression data that is used for this model there is no first order linear auto correlation.

Table 4.9: Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.924a	.853	.850	.42033	.853	257.335	6	266	.000	2.085

a. Predictors: (Constant), COMPUTE X1X2X3X4X5=X1 * X2 * X3 * X4 * X5, Project Funding, Construction Materials, Project Distinctive , Stakeholder Engagement , Project Management Ability

b. Dependent Variable: Quality of Building Construction Projects

Source: (SPSS Output, 2020)

4.8.2.2 Multicollinearity Test

Table 4.10: Multicollinearity test of independent variable (Coefficients^a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.268	.246		-5.162	.000		
	Stakeholder Engagement	.420	.044	.382	9.581	.000	.347	2.882
	Project Funding	.140	.034	.142	4.151	.000	.471	2.121
	Construction Materials	.214	.032	.243	6.762	.000	.429	2.329
	Project Management Ability	.430	.055	.321	7.823	.000	.328	3.050

Project Distinctive	.163	.035	.178	4.658	.000	.378	2.642
COMPUTE X1X2X3X4X5 =X1 * X2 * X3 * X4 * X5	.000	.000	-.121	1.821	.070	.124	8.049

a. Dependent Variable: Quality of Building Construction Projects

Source: (SPSS Output, 2020)

The result in table 4.10 show that the collinearity between independent variables has no series problem, hence the value of tolerance for all independent variable is greater than 0.1 and all VIF is less than ten ($VIF < 10$), according to (Pallant 2005). Thus, from the above table 4.10 it can be concluding that there is no co linearity within the data of the study.

4.8.2.3 Regression analysis between dependent variable, independent variables and moderating variable

Table 4.11: Regression model between dependent variable, independent variables and moderating variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924a	.853	.850	.42033

a. Predictors: (Constant), COMPUTE X1X2X3X4X5=X1 * X2 * X3 * X4 * X5, Project Funding, Construction Materials, Project Distinctive , Stakeholder Engagement , Project Management Ability

b. Dependent Variable: Quality of Building Construction Projects

Source: (SPSS Output, 2020)

Table 4.11 above indicates R, R Square, Adjusted R Square and standard error of the estimate. Further, it lists the independent variables that are entered in to the regression model. R (.924) is the correlation of independent and moderate variables with the dependent variable. The model summary, above shows the R Square value is 0.853. This tells us how much of the variance in the dependent variable (quality of building construction projects) are explained by the independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive). This means that the model (independent and moderate variables) explains 85.3% of the variance in dependent variable (quality of building construction projects) under the case study, the remaining 14.7% of the changes in the fact can be attributed from other factors. To assess the statistical significance of the result it is necessary to look in to table 4.12 ANOVA.

Table 4.12: ANOVA result between dependent variable, independent variables and moderating variable.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	272.791	6	45.465	257.335	.000b
	Residual	46.996	266	.177		
	Total	319.787	272			
a. Dependent Variable: Quality of Building Construction Projects						
b. Predictors: (Constant), COMPUTE X1X2X3X4X5=X1 * X2 * X3 * X4 * X5, Project Funding, Construction Materials, Project Distinctive , Stakeholder Engagement , Project Management Ability						

Source: (SPSS Output, 2020)

The F Value in the ANOVA test determine the p value; the P value is the probability of getting a result at least as extreme as the one that was actually observed, given that the null hypothesis is true. The null hypothesis is rejected when the p value is smaller than the alpha level from the ANOVA test. Which means the null value is rejected if the critical F value is smaller than F value in the ANOVA tests, unless you also have a small P value. Hence, for this research the test P value of 0.00 from table 4.12 was computed which indicate the test P value is smaller than an alpha level of 0.05 and 0.01, which means the null hypothesis couldn't be rejected by comparing the F value in the ANOVA test.

In sum, the ANOVA Table 4-12 above shows that p - value (sig.) is significant at 0.01 level of significance. This indicates a statistically there is significant contribution, as indicated by the Sig. value equal to .000. Therefore, the ANOVA table indicates that the model as a whole is significant at $p < 0.01$). The R^2 result indicates that 85.3% of the variance in quality of building construction projects (dependent variable) has been significantly explained by independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive). Accordingly, since the sign of 'B' coefficient for the independent and moderating variables is positive, therefore there is a positive relationship between the variables.

The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The F value shows 257.335 which is greater than the F critical it shows the model is significant. Which implies the coefficients included in the model improved the model fit.

Table 4.13: Regression coefficient between dependent variable, independent variables and moderating variable.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	-1.268	.246		-5.162	.000
	Stakeholder Engagement	.420	.044	.382	9.581	.000
	Project Funding	.140	.034	.142	4.151	.000
	Construction Materials	.214	.032	.243	6.762	.000
	Project Management Ability	.430	.055	.321	7.823	.000
	Project Distinctive	.163	.035	.178	4.658	.000
	COMPUTE X1X2X3X4X5=X1 * X2 * X3 * X4 * X5	.000	.000	-.121	-1.821	.070
a. Dependent Variable: Quality of Building Construction Projects						
b. Predictors: (Constant), COMPUTE X1X2X3X4X5=X1 * X2 * X3 * X4 * X5, Project Funding, Construction Materials, Project Distinctive , Stakeholder Engagement , Project Management Ability						

Source: (SPSS Output, 2020)

In general, Table 4.13 shows the ANOVA results of the multiple regression analysis. The significance value of 0.00 indicates that the regression relationship is strongly significant in predicting dependent variable (quality of construction projects) against its factors explained as independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) which shows the model is significant and fit to the model.

The regression model equation was:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6(X_1X_2X_3X_4X_5) + \varepsilon$$

Where:

Y = Quality of Building Construction Projects

β_0 = Constant Term; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and β_6 = Beta coefficients;

X_1 = Stakeholder Engagement; X_2 = Project Funding; X_3 = Construction Materials; X_4 = Project Management Ability; X_5 = Project Distinctive

ε = Error Term

As per the result above the resulting equation become:

$$Y = -1.268 + 0.382X_1 + 0.142X_2 + 0.243X_3 + 0.321X_4 + 0.178X_5 + \varepsilon(0.05)$$

The result of this study exhibited that all the independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) have positive and significant effect on dependent variable (quality of building construction projects) in the studied selected building construction industries in Addis Ababa, Ethiopia. As the result indicate standardized coefficient of Beta=.382 (at a tolerance level of 9.581 and sig. at the 0.01 level) for stakeholder engagement, and standardized coefficient of Beta=.142 (at a tolerance level of 4.151 and sig. at the 0.01 level) for project funding, standardized coefficient of Beta=.243 (at a tolerance level of 6.762 and sig. at the 0.01 level) construction materials, standardized coefficient of Beta=.321 (at a tolerance level of 7.823 and sig. at the 0.01 level) project management ability, and standardized coefficient of Beta=.178 (at a tolerance level of 4.658 and sig. at the 0.01 level) project distinctive, which all results implied that from the regression analysis; its results that all the independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) have positive and significant effect on dependent variable (quality of building construction projects) in the studied selected building construction industries in Addis Ababa, Ethiopia.

Meanwhile, as shown on table 4.13 above quality of building construction projects for the case study has smallest and insignificant association with 'COMPUTE $X_1X_2X_3X_4X_5=X_1 * X_2 * X_3 * X_4 * X_5$ ' in which this computing term was included in the regression model is because the study has used moderating variable for the given case study, and with the findings of a standardized coefficient of Beta=-0.121 (at a tolerance level of -1.821, and sig. level of 0.07 which is higher than a sig. level of 0.01 and 0.05, that is unacceptable). Therefore, according to research findings 'COMPUTE $X_1X_2X_3X_4X_5=X_1 * X_2 * X_3 * X_4 * X_5$ ' element have a very

small significance and little impacts as a factor on quality of building construction projects which were under the case study since a sig. level of 0.07 which is higher than a sig. level of 0.01 and 0.05, that is unacceptable. Arguably, the opposing result may be attributable to differences in the sample, perhaps in terms of different sample size and area of the case study. Therefore, 'COMPUTE $X_1X_2X_3X_4X_5=X_1 * X_2 * X_3 * X_4 * X_5$ ' element, have a very small significance to predict dependent variable quality of building construction projects for the case study areas. Hence, 'COMPUTE $X_1X_2X_3X_4X_5=X_1 * X_2 * X_3 * X_4 * X_5$ ' parameter would be excluded from the regression model for the study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents a summary of the study findings, conclusions and recommendations. The findings are summarized in line with the objectives of the study which include determining the influence of stakeholder engagement on quality of construction projects in case of building construction industries in Addis Ababa, Ethiopia; evaluating the extent to which construction materials affect quality of building construction projects in Addis Ababa, Ethiopia; investigating the effect of project funding on quality of construction projects in case of building construction industries in Addis Ababa, Ethiopia; assessing the influence of project management ability on quality of construction projects in Addis Ababa, Ethiopia. These independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) were studied against the dependent variable which is quality of building construction projects.

5.2 Summary

According to the data analysis in the previous section, summary of the findings presented as follows.

The study determined the influence of four collective building blocks (Site engineer engagement, Contractor engagement in planning, County inspector's engagement, and Quantity surveyor engagement) of stakeholder engagement on quality of building construction projects in Addis Ababa, Ethiopia and all of the items for the stakeholder engagement that affects quality of building construction project scores a total mean of mean of four collective building blocks (Site engineer engagement, Contractor engagement in planning, County inspector's engagement, and Quantity surveyor engagement) of stakeholder engagement is 3.76, which implied that the respondents agreed to the fact that the stakeholder engagement affects quality of building construction project at the level of great extent, and found that stakeholder engagement greatly influence quality of building construction project.

The study further evaluating the extent to which the three collective building blocks (Cost of funds, Source of finance, Adequacy of finances) of project funding influence quality of building construction projects in Addis Ababa, Ethiopia and all of the items for the project funding that affects quality of building construction project scores a total mean of mean of three collective building blocks (Cost of funds, Source of finance, Adequacy of finances) of project funding is 4.08, which implied that the respondents agreed to the fact that the project funding affects quality of building construction project at the level of great extent, and revealed that project funding greatly influences quality of building construction project.

The study also assessed the influence of five collective building blocks (Source of materials, Poor performance of quality tools, Cost of materials, Material/Equipment specification, Quality of materials) of construction materials on quality of building construction projects in in Addis Ababa, Ethiopia and found that all of the items for the construction materials that affect quality of building construction project scores a total mean of mean of the five collective building blocks (Source of materials, Poor performance of quality tools, Cost of materials, Material/Equipment specification, Quality of materials) of construction materials is 3.92, which implied that the respondents agreed to the fact that the construction materials affect quality of building construction project at the level of great extent and found that construction materials greatly influences quality of building construction project.

The study in addition explored to what extent that seven collective building blocks (Conflict management, Leadership, Lack of Management commitment, Lack of motivation, Low effective project management system, Team management, Solutions development) of project management ability on quality of building construction projects in in Addis Ababa, Ethiopia and found that all of the items for the project management ability that affects quality of building construction project scores a total mean of mean of seven collective building blocks (Conflict management, Leadership, Lack of Management commitment, Lack of motivation, Low effective project management system, Team management, Solutions development) of project management ability is 3.84, which implied the respondents agreed to the fact that the project management ability affects

quality of building construction project at the level of great extent and found that project management ability greatly influences quality of building construction project.

The study also evaluates the extent of influence of three collective building blocks (Length of the project, Complexity of the project, Size of the project) of project distinctive on quality of building construction projects in Addis Ababa, Ethiopia, and found that all of the items for the project distinctive that affect quality of building construction project scores a total mean of mean of three collective building blocks (Length of the project, Complexity of the project, Size of the project) of project distinctive is 3.83, which is implied the respondents agreed to the fact that the project distinctive affect quality of building construction project at the level of great extent which found that project distinctive greatly influences quality of building construction project.

Finally, the statistical results of study from the correlation and regression analysis confirm and explore that there is a strongly significant positive correlation at the level of 0.01 between independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive) with the dependent variable (quality of building construction projects). The regression was conducted based on the conceptual framework that is between dependent variable (quality of building construction projects) and implied that all dependent and moderate variables for the study have a positive impact and most largely and significantly associated with dependent variable. Regression analysis in addition revealed that that nearly 85.3% of the variance in the data for the study which revealed that of dependent variable (quality of building construction projects) is explained by independent variables (stakeholder engagement, project funding, construction materials, and project management ability), and moderating variable (project distinctive).

5.3 Conclusion

Based on the responses majority of respondents agreed, based on the results of the study and the summary of findings the following conclusions are given:

The study determined the influence of stakeholder engagement, and concluded that stakeholder engagement positively and significantly influences quality of building construction projects in Addis Ababa, Ethiopia,

The study further concluded that project funding greatly and positively influences quality of building construction projects in Addis Ababa, Ethiopia,

The study also assessed the influence of construction materials and concluded that construction materials has a positive and significant influence on quality of building construction projects in Addis Ababa, Ethiopia,

The study explored the influence of project management ability and concluded that project management ability significantly influences the quality of building construction projects in Ababa, Ethiopia,

Finally, the study further deduced that of project distinctive is very greatly influence the quality of building construction project in in Addis Ababa, Ethiopia.

5.4 Recommendation

Based on the study results and conclusions drawn above, some recommendations are proposed as a means of alleviating the problems found.

The study recommends that stakeholders and the construction industry should embrace transparency through information accessibility, clarity, accuracy and sharing of information which includes the progress of the building project as well as the financial usage, and they both must work together with all the stakeholders in the building industries in order to ensure quality of building construction projects.

The study also pushes for the contractors and designers need to be compelled to follow strictly to the required standards of materials for building construction projects. This will ensure that the management ability is put into consideration by encouraging those in management to embrace risk management practices such as risk identification, quantification, monitoring and mitigation to help prevent risks and improve quality.

Providing financial incentives to encourage development of sustainable construction projects that should be emphasized by the relevant government authorities. Those encouragements ensure that the finances are adequate so as to allow the contractors and other people involved to deliver quality work and on time.

Finally, from the findings the study suggested that formulation and updating of laws and regulations that provide legal frame work for the development of safe sustainable quality of construction projects in the areas of building construction projects under the case study.

5.5 Suggestion for Further Study

The present study used building construction projects of construction industries inside Addis Ababa, Ethiopia. Hence, future studies should consider expanding their scope to include the whole construction industries in Ethiopia, and to be done in other town in the country. Furthermore, the evaluation of factors affecting quality of construction project is limited to building construction projects, therefore further studies should be conducted on to on the quality of the factors affecting construction projects of different areas and in different parts of the country.

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St.Mary's University
Post Graduate program
Department of project Management
M.A thesis on Project Management

Appendix I: Letter of Introduction

Nega Geletu,

St. Mary's University,

Phone number: +251912323493,

Addis Ababa, Ethiopia.

Dear Respondent,

SUBJECT: REQUEST FOR RESEARCH DATA

I am a graduate student at St. Mary's University. In partial fulfilment for the award of a Master of Arts Degree in Project Management, I am carrying out a research study on the 'FACTORS AFFECTING QUALITY OF CONSTRUCTION PROJECTS: IN THE CASE OF SELECTED BUILDING CONSTRUCTION INDUSTRIES IN ETHIOPIA'.

You have been identified as one of the people that could be of assistance with the research and I thus request your participation in the research. Essentially, you would be required to complete a questionnaire. You will be treated anonymously and your responses will be treated with utmost confidentiality. The information you provide will be used only for academic purposes.

Yours Faithfully,

Nega Geletu

Thank you in advance.

Appendix II: Research Questionnaire

Kindly answer the following questions by writing a brief answer or ticking “√” in the boxes provided.

PART A: Background Information

1. What is your designation in the organization?.....

2. What is your relationship with the project?

Contractors []

County inspectorate []

National government officials []

Project owners []

3. Which is your highest level of education?

Post Graduate []

Undergraduate []

Diploma []

Certificate []

Any other (specify).....

4. How long have you been in this industry?

1 to 5 years []

5 to 10years []

11 to 15 years []

16 to 20 years []

21 years and above []

PART B: I Stakeholder Engagement

To what extent in your industry do you think stakeholder engagement in building construction projects?

Very great extent [5] Very low extent [1]

Great extent [4]

Moderate extent [3]

Low extent [2]

5. To what extent in your industry do you think stakeholder engagement in building construction projects?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Site engineer engagement					
Contractor engagement in planning					
County inspector's engagement					
Quantity surveyor engagement					

6. In your opinion, how does the stated stakeholder engagement factors influence building construction projects?

.....

PART C: Project Funding

To what extent does project funding factors influence building construction project in your industry?

Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

7. To what extent does the following project funding factors influence building construction project in case of your industry?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Cost of funds					
Source of finance					
Adequacy of finances					

8. In your own opinion, how does project funding factors influence building construction project in case of your industry?

.....

.....

PART D: Construction Materials

9. To what extent do construction materials influence building construction projects of your company?

Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

10. To what extent do the following construction materials influence building construction projects in case of your industry?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Source of materials					
Poor performance of quality tools					
Cost of materials					
Material/Equipment specification					
Quality of materials					

11. In your own opinion, how do construction materials stated above influence building construction projects in case of your industry?

.....

PART E: Project Management Ability

12. To what extent does factors relate to project management ability influence of building construction project in case of your construction industry?

Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

13. To what extent do the following project management ability influence build construction project in case of your construction industry?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent

Conflict management					
Leadership					
Lack of Management commitment					
Lack of motivation					
Low effective project management system					
Team management					
Solutions development					

14. In your own opinion, how do the factors relate to project management ability above influence building construction project in case of your industry?

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PART F: Project Distinctive

15. To what extent do the following aspects of project distinctive influence building construction project in your industry?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Length of the project					
Complexity of the project					
Size of the project					

PART G: Quality of Building Construction Projects

16. To what extent in your industry would you rate the quality of building construction projects in the following aspect?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Satisfaction of contract specifications					
Completion of project with time					
Enhancing customer/owner satisfaction					
Motivation and empowerment of employees					
Avoid disputes and claims					
Performance based purpose					

Thank You for Your Participation

Appendix III: Selected Building Construction Industries in Addis Ababa, Ethiopia Participated in the Study

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
1	Zagwila Construction PLC	Alimayehu Yashaya	28/05/2020	
2	AQius consulting	Abebe Berea	28/05/2020	
3	Netgesha G/michael Building Contractor	Netgesha G/michael	29/05/20	
4	YAREAL ABEDA Consulting Architects And ENGINEERS	Yipereyal Abebe	29/05/20	

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
1	Kela Consulting Architects and Engineering PIC	MESHA MARU	26/05/2020	 
2	BURJO CONSTRUCTION PRA	BIEUR AENMIEU	26/05/2020	
3	SATUEL MENGESH CONSULTING ARCHITECTS AND ENGINEERS	SATUEL MENGESH	27/05/2020	 
4	HEKASHA CONSULTING ARCHITECTS AND ENGINEERS	HEKASHA Golek	27/05/2020	 

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
1	Abdi Sendakachew FIC/AFI/PI/S	388-748 95-96 Addis Aber, Terefe Genet, Manager	05/05/2020	
2	Temesgen and friends Col/CP	አብነት ጊዮርጊስ ዳ. ለ. አብነት Temesgen Gebremariam General Manager	5/05/2020	
3	Telkoma, farwa & friends consulting	ዝኤ ለሣገን Telephone Solomon 95, 96, Addis, AF General Manager	5/05/2020	
4	Light Ethiopia Con.	Tamene H Meriam	07/05/2020	

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
	Amenou Hanae friends building design company pls	Amenou Amenou General Manager	27/05/20	 
	Kalleiden, mekky- friends CONSULTING P/S	Nedjetun MEGASH TESHOME General Manager	28/05/20	 
	Architect CONSULTING A/E	Tadel & Angour C. Manager	28/05/20	 
	EFEMU ESTU SPC ISPAEC & FRIENDLY BUILDING CONSTRUCTION	ISVE of LWESANGE A. Manager	29/05/20	 

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
1	Kafita B-C	Abdu Tema	29/01/2020	
2	Mareya Emeraldale B.C	Mareya Emeraldale	29/01/2020	
3	Megash Wadere B.C	Megash	30/05/20	
4	DANIEL ERGETKA	Daniel Egetka	02/06/20	

List of selected Building Construction Companies and Consulting Companies which are participating in completing the questionnaire

No	Name of the company	Name of the person who accepted the request	Date	Signature and Stamp of the Company
1	Kolla Karanjo sub City Administration Construction office	gal/or/2020	24/05/2020	
2	Filkanan Constructions P.L.C	gal/or/2020	24/05/2020	