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COLLEGE OF BUSINESS AND ECONOMICS

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The Effect of Quality Management on Project Success: Evidence From Real Estate Projects in Addis Ababa

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Statement of Declaration

I hereby declare that the thesis/ dissertation entitled" The Effect of Quality Management on Project Success Evidence from Real Estate Projects", submitted in partial fulfillment of the requirements for the degree of Master of Arts in Project Management at BAIS, Addis Ababa University, is my original work and has not been submitted to any other institution for the award of any degree or certificate. All sources of assistance and support received during the course of this study have been duly acknowledged.

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This is to certify that the thesis prepared by Yordanos Abebayehu, entitled "the Effect of Quality Management on project success evidence from real estate projects". Submitted in partial fulfillment of the requirements for the Degree of Master of Arts Project Management compiles with the regulation of the University and meets the accepted standards with respect to Originality and quality.

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Abstract

This research study aimed to examine the effect of quality management on project success in selected real estate projects in Addis Ababa, Ethiopia. In particular, the current study sought to investigate the effects of quality planning, quality assurance, and quality control on project success. This research employed quantitative research method and explanatory research design. Out of a target population of 164 professionals, the study sampled 116 respondents was taken by using Yamane formula sample size determination model, purposive and stratified sampling techniques was used for collecting information from the organizations. The study utilized structured, close-ended questionnaires to collect data from project managers, site engineers, consultants, office engineers, and foremen involved in selected real estate projects. Data were analyzed using descriptive statistics, correlation analysis, and multiple regression analysis assisted by using SPSS version 27. The findings showed that quality planning, quality assurance, and quality control had positive and statistically significant effects on project success. From the three dimensions of quality management, quality assurance had the greatest impact on project success followed by quality planning and then quality control. Moreover, it is evident from the results that successful quality management practices will enhance project success by improving time, cost, quality, and client satisfaction. According to the findings, theoretical implication, practical implication, specific recommendations and suggestions for further study are provided.

Key words: Project Management, Quality Management, Quality Planning, Quality Assurance, Quality Control, Project Success and Real Estate

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Abbreviations and Acronyms

CPM	Critical Path Method

ERP	Enterprise Resource Planning
ISO	International Organization for Standardization
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
PMPQ	Project Management Planning Quality
QA	Quality Assurance
QC	Quality Control
QCI	Quality Control and Inspection
QM	Quality Management
QP	Quality Planning
TQM	Total Quality Management

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Quality management is to ensure efforts to achieve the required level of quality for the product, which is well planned and organized. It focuses on improving stakeholder satisfaction through ongoing and incremental improvements to processes, including eliminating pointless tasks, continuous monitoring and application of quality procedures in all aspects of the project. Project success from sponsor and the beneficiary points of view required both the explicit and implied quality requirement as an input. “Conformance to requirements or fitness for use" was another further defined of quality. This suggests that product or services must meet up with the anticipated objectives of the project, thereby providing value to both the sponsor and beneficiary. The main objective of quality management is to confirming that the project design and specifications are adhered to, and that the expectations of stakeholders are met or exceeded (PMI, 2021).

Quality in the construction industry emphasizes the competence to discover requirements with conformance to a quality standard (Leong et al., 2014). Furthermore, (Mane & Patil, 2015) determine that quality construction projects as well as project success can be regarded as the fulfillment of expectations of the project participants. and that it is one of the main factors in construction and real estate project success. Quality management is one of the areas of knowledge in project management. It is a discipline that seeks to ensure that the outcomes and benefits of projects are fit for purpose and meet requirements (PMI, 2013). While (Mane & Patil, 2015) also defines a Quality management system as all activities of the overall management function that determine the quality policy, objectives, and responsibilities, implemented through mechanisms such as quality planning, quality control, quality assurance within the quality system. Quality management is the execute of synchronizing all required processes and responsibilities to maintain and to keep high level standard. In construction and real estate projects quality management is a critical component to preventing defects in the finished products results in initiating the needs for replacements, flaws, accidents, or any other form of anomalies that have a negative impact on the outcome and clients experience (Zeng et al., 2019).

Quality management has three essential elements: quality planning, assurance, and control. There are indications that showed several advantages from implementation of quality management, such as improving communication between stakeholders, decreasing rework and wastage, improving oversight of sub-contractors and suppliers, reducing errors and other benefits which make them more productive, profitable and meet the client's satisfaction and it can also improve the processes of the project efficiency. Through general guidance, documentation and perpetual improvement using "plan-do-check-act" (PDCA) technique, the satisfaction of customers and quality objectives are achieved successfully (Wawak et al.,2020).

For a while, the construction projects have been lived in quality program of inspection and quality control. Construction works and materials were either approved or rejected depending on the inspection and quality control. The ISO 9000 series is a framework for improving quality in the construction industry (Kumaraswamy & Dissanayaka, 2000). This has led to the development of the quality assurance system which follows a parallel orbit with that of construction industry. Although, the procedure has some basic distinctions when compared to that of construction, but these are mainly due to the different characteristics of the construction production process and other operational activities.

The construction industry in Ethiopia is a significant economic growth determinant for the nation according to the report, the contribution of construction to gross domestic products (GDP) accounting to 9.4% of total outputs. This would put the industry's market value at about $26 billion with an estimated average projection annual growth rate of 8% predicted through 2026 (National Bank of Ethiopia, 2022). The construction industry was on rapid growing and main receiver of commercial and residential building projects are undergoing results in turning the country in to one of the continent's highest performing economies (African Economic Outlook Report, 2022). As cities expand rapidly, there is a greater demand for strong and high-quality buildings that are completed within the scheduled time. The rise of the real estate sector is essential to a nation's overall development because it greatly improves employment, commercial banking, and capital markets. Furthermore, it improves households' well-being by providing excellent shelter and encouraging the building of personal wealth that can be leveraged for future prosperity (Taylor, 2004).

A key component of real estate project success is quality and meeting the expectations or satisfaction of all project participants also defines quality. Over the year, many local real estate projects have had problems and challenges with quality issues. Some studies examine general concept of quality management implementation ideas or certain aspects of quality control. Despite the study, there is still limited understanding of Quality management implementation and how their proper implementation impacts on project success this makes it difficult for real estate projects performance and quality outcomes. Therefore, this study aims to examine the effect of quality management on project success and give clarity into the most effective practices for improving quality, time, cost, and client satisfaction in Addis Ababa real estate projects context.

1.2. Statement of the Problem

Quality assurance (planning to meet quality requirements) and quality control are both parts of project quality management (action performed to control results to determine if they adhere to requirements). quality management provides a framework for efficient, effective, and beneficial use of tools, techniques, and procedures leading to successful operation of a construction project." On a particular note, quality assurance, quality control, and quality planning, collectively used for quality management in the construction sector (Mane & Patil, 2015). The extent of conformance with the final delivery to the client's criteria is referred to as quality. one common cause projects fail is because quality is compromised to comply a short deadline (Kim et al., 2012). It is very helpful to finish work on schedule just to find out that the supplied items won't deliver quality and functionality (PMI, 2021). How ever, the Ethiopia construction industry is known having about by almost greater than 65% of delay in project timeline due to the project did not meet the required quality (leaks, cracks and rework etc.). These outcomes caused a loss of around $100million annually due to delays that could have been prevented (Ministry of Construction, 2022). These issues with quality problems have raised concerns about standards and safety.

In most real estate companies endures to suffer with disorganized performance, delays, rework, workmanship defects and increased projects costs. Globalization and competition have increased within the last thirty years (Neyestani & Juanzon, 2016). As stated by (Quiambao & Alvaro, 2023) one of the important factors causing significant quality problems in real estate projects is non-involvement of project team members in quality decision making. Several numbers of assessments have criticized the real estate sector, most notably with low productivity, poor quality and

inadequate quality management system (Ali & Rahmel, 2010). In the real estate sector, achieving acceptable quality standards has long been a challenge (Jima, 2018). Great disbursement of time, money and resources, both human and material are wasted annually due to ineffective or non-existent quality management procedures.

Most of real estate projects in Addis Ababa encounters some quality problems issues during and after construction due to inexperienced manpower, low quality materials, non-descriptive bid documents, insufficient design and highly attributed to lack of appropriate and consistent monitoring and control (Markos, 2018). Real estate projects predominantly experience quality failure including untimely deterioration and structure defects due to lack of effective supervision, appropriate equipment and materials available for use, a quality assurance team that leads the process, staff turnover, skilled turnover, inefficient resource management, and contractor issues are some of the challenges that affect the attainment of a project's quality (Awoke, 2022).

Despite the recognition of these challenges, there is limited empirical evidence on how the effective implementation of quality management influences project success in terms of time, cost, quality performance, and client satisfaction. Consequently, the effect of quality planning, quality assurance, and quality control on the success of real estate projects has not been thoroughly investigated in the context of Addis Ababa real estate projects.

1.3. Research Questions

1. What is the effect of quality planning on the real estate project success in Addis Ababa, Ethiopia?
2. What is the effect of quality assurance on the success of real estate project implemented in Addis Ababa, Ethiopia?
3. What is the effect of quality control on the success of real estate project success in Addis Ababa, Ethiopia?

1.4. Research Objectives

1.4.1. General Objective

To examine the effect of quality management on real estate project success in Addis Ababa, Ethiopia.

1.4.2. Specific Objectives

The specific objectives align with the general research objectives and aim to address the effect of quality management on project success.

1. To determine the effect of quality planning on real estate project success in Addis Ababa, Ethiopia.
2. To determine the effect of quality assurance on the real estate project success in Addis Ababa, Ethiopia.
3. To evaluate the effect of quality control on the real estate project success in Addis Ababa, Ethiopia.

1.5. Significance of the Study

This study will benefit academic field by strengthening and enhancing the knowledge about quality management and how it affects, influences real estate project successes. It delivers empirical evidence on the relationship with quality planning, quality assurance, and quality control with project success. The findings will assist to fulfill gap in prior research, particularly when it comes to real estate projects, where research on quality management is limited on how effective execution of these practices influences real estate projects success. As a result, it provides a foundation for further studies on project success and quality management. The real estate companies and the construction professionals will use to identify which quality management components most significantly influence real estate project success. by implementing quality planning, assurance, and control the findings can help the professional to improve project success. They also help reduce delays, cost overruns and rework to promote efficiency and customer satisfaction**.** The findings could help shape professional guidelines, standards and contribute the development of better organized quality management framework in Ethiopia. This research will also provide insights into practical implications and policy recommendation.

1.6. Scope of the Study

To ensure clarity and emphasis regarding the research problem, this study is constrained by thematic, geographical, temporal, and methodological scopes.

Time scope: this study examines current ongoing and completed to evaluate the effect of quality management on real estate projects. The study cover both recently completed and ongoing real estate projects. This period is selected to ensure the presence of reliable and recent data.

Thematic scope: the study focuses on the relationship between the effect of quality management on project success in real estate projects. The three independent variables under quality management included quality planning, quality assurance, and quality control. This choice was made because the aforementioned independent variables constitute some of the most important elements of project quality management in project management theories and PMBOK. The dependent variable under investigation was project success, measured based on time performance, cost performance, quality performance, and client satisfaction.

Geographical scope: study is geographically limited to private real estate developers(companies) in Addis Ababa, Ethiopia. Particularly, the study examined the development projects of Ayat Real Estate, Gift Real Estate, and Ovid Real Estate. These real estate development firms were chosen due to their many projects currently on-going and finished, having worked in Addis Ababa many mixed used buildings now, as well as employing various professionals dealing with project quality management processes. Addis Ababa was considered because it houses the major real estate development undertakings in Ethiopia.

Methodological scopes: this study focuses on research design, data collection and analysis methods used to examine the effect of quality management on project success in real estate project Addis Ababa, Ethiopia. The study employees a quantitative research approach, assist by explanatory, to examine the relationship between independent variable and dependent variables which are quality management and project successes. Data will be collected from real estate projects from selected private real estate developers (company) using structured questionnaires distributed to project managers, engineers and other relevant professionals. The collected data will be analyzed using statistical techniques to test hypothesized relationships and include descriptive statistics as means, standard variation and frequency, correlation and regression analysis to determine the strength and direction of the relationship between variables. The study excludes qualitative research approaches such as interview and case studies.

1.7. Limitation of the study

This study has certain limitations that make it difficult to effectively achieve its objectives. Examining quality management in Addis Ababa real estate projects is the primary objective of this thesis. The processes and methods related to applying quality management in the city's real estate projects are the particular focus of the study. However, it was unable to collect information from every real estate project because of the huge number of real estate project in Addis Ababa. The study is limited to real estate companies that are currently active moreover, project management is a broad and comprehensive discipline that includes domains such as procurement management, risk management, time management, and cost management, this research is limited to quality management. The respondents are employed in the real estate sector. Consequently, the outcome and the suggestion of this paper would seem to be more appropriate for real estate projects and building projects.

1.8. Operational Definitions

Quality management: is the process of making sure that every project activity necessary to plan, design and carry out a project is effective and efficient with regard to the purpose of objective and its performance. The concept action and procedures are implemented within the framework of construction project that to assures the deliveries within the project satisfy standards and meet requirements. Quality procedure in place within the project that affects quality projects compliance with project specifications quality monitoring within project.

Quality planning: the process of setting quality standards, creating quality plans and detailing procedure needs and defining resources required to accomplish project quality objective and goals. Development of written quality plans, determination of quality standards, distribution of sources for quality awareness of quality requirement among terms.

Quality assurance: it is the process of providing evidence to create confidence and increase trust among all stakeholders that the quality-related tasks are being carried out successfully; and that all intended steps are being taken to give sufficient assurance that a product or service will meet the specified requirements for quality.

Quality control: involves ongoing monitoring and documentation for the outcomes of executing quality plan activities, aiming to assess performance and suggesting appropriate modifications. It

comprises activities intended to monitor, examine and test the project's result to ensure that the final output meets the stipulated standards of quality. Numerous inspections were carried out, defects were found and material testing that was verified, confirmed to specifications.

Project success: means how successful the project has been in achieving its objectives in relation to cost, schedule, quality, and customer satisfaction. Project has been carried out as per the planned schedule, done successfully within the budget, followed the project's quality, removed defects, made customers satisfied, and achieved the project's objective.

Real estate: is the process of turning a piece of land into a residential or commercial property through a number of planned building projects.

1.9. Organization of the Study

The chapters of this research paper are as follows:

Chapter one: shows background of study, statement of the problem, objective of research, significance of the study, scope and operational documents.

Chapter two: focuses on literature review. It contains relevant theories, conceptual and empirical decisions leading to the identification of research gaps and conceptual framework.

Chapter three: presents the research design, target population, sampling methods, sample size, data collection instruments to be used as well as the method of data analysis and presentation.

Chapter four: displays the major findings, analysis, and discussion of sample population based on the primary data gathered.

Chapter five: discussed the summary of major findings, their respective conclusions and possible recommendations will be presented.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

Literature reviews of related works are compiled and organized in this chapter in accordance with the title of this study "the effect of quality management on project success" among the real estate projects in Addis Ababa. The objective of this study is to comprehend the effect of quality management regarding quality planning, quality assurance, and quality control, as well as real estate project success. This chapter outlines the objective of this issue. Literature reviews of theoretical explanation of these concerns are mentioned. Furthermore, literature reviews of previous empirical efforts conducted by other researchers regarding the scope of interests of this research study are also mentioned. Finally, the conceptual framework of this study is determined in relation to the hypothesis.

2.1. Theoretical Literature Review

2.1.1. Review of Concepts

Quality management is considered an essential component of any corporate organization. For at the end of it all high-quality goods and services given is what quality delivers in terms of customer satisfy, encourage loyalty and reduced risks or wasted effort. In other words, quality is about meeting or surpassing customer expectations on the part of buy-in and therefore, is critical to the long-term existence and success of organizations. In the real estate sector, quality becomes more important because of the complex character of projects and there is clear link between the quality performance of the projects and client satisfaction with project sustainability.

According to existing literature, quality can be attained through continuous improvement, as long as the quality plans are well-developed and implemented to fulfill established standards and stakeholder expectations. According to (PMI, 2021), adds that quality management within projects includes key processes like quality planning, quality assurance, and quality control, whereby project quality is realized over time through systematic prevention and elimination of defects. More significantly, efficient communication of quality plans and continuous training increases employee involvement in quality related activities, which in turn improves the overall project performance and adherence to quality standards.

2.1.2. Project

Project is “a short-term activity undertaken to develop a unique product or service” (PMI, 2021). The majority's perception of a project's comprehension is converting input into output through processing, which contains the main presumptions that underlying this understanding (PMI, 2017). A project is a collaborative endeavor aimed at fulfilling a particular objective. Projects are not permanent configurations but rather temporary systems of teamwork established within or between organizations to complete specified tasks within a stipulated short time period (Turner, 2016). The classic or traditional approaches to project management includes a body of maximums, incorporate assumptions, as well as certain implied that do not effectively apply or fall apart for the real-world complex projects. These characteristics are linked with what is referred to as a neo-classical outlook that is explicated below (Aliu et al., 2023).

A “project” can be broadly defined “Any set of tasks and activities that require human resources, non-human resources (funds, people, equipment), are multi-functional (cross multiple functional lines), have a clear objective, need to meet specifications, and occur between dates with budgets (if applicable)” (Kerzner, 2013). “Projects can be portfolios or programs, or they can exist independently” (PMBOK, 2021).

A project is characterized as a collection of actions carried out to accomplish a specific goal. A project is normally done only once and cannot be repeated. A project has a start time, a finish time, and a budget. There are various phases to a project. A project uses variety of resources such as people, money, and materials, and these resources are limited and shared.

A project is a collection of works that are carried out each time with the intention of achieving specified objectives. It is clear that it has certain characteristics, that makes it a one-time program or a one-time project, with budgeting, on investment, a life cycle that requires data for starting and finishing, as well as the use of many resources, mostly limited or shared by other projects. according to some authors defined as “project is a combination of unique, difficult, and related tasks with one objective that must be completed on schedule, within budget, and by specifications” (Kylindri, 2019).

Tasks involved in the process groups are likely to be subjective from one project to another as each one of them is unique with the possibility of each one of their respective clients having different demands (Kerzner, 2017).

2.1.3. Project Management

Project management is planning, organization, monitoring and control of all facet of the project with the inspiration of all involved parties to succeed. By understanding the fundamental concepts involved in a project, it can allow as to conclude that project management is the tools and techniques to implement the project to a definite goal. The goal of the project include safety while adhering to the time schedule, staying within budget, and meeting performance standards. According to the definition of project management, it is concerned with project performance in terms of short-term aspects of project success, such as adherence to time, cost, and quality objectives (IPM Association, 2006). Successful project management can be defined as achieving a continuous stream of project objectives within time, within cost, at the desired performance and technology level while utilizing the assigned resources effectively and efficiently (Kerzner, 2017).

Project management is a critical component in the management of construction projects. It requires not just familiarity with modern management concepts, but also thorough understanding of the processes of design and construction. Construction projects are characterized by well-defined objectives in terms of scope, time, cost, quality, and availability of resources. Even though construction projects may differ from projects carried out such as aerospace, energy, or pharmaceuticals due to aspects of technology and institutional arrangements, according to (Radujkovic & Sjekaica, 2017).

2.1.4. Project Success

A definition of " project" was previously explored, and "success" is the most elusive component. An explanation of an event in which the goals of a project are achieved with consistency in the schedule allocated and budget, achieving the intended technological performance level while making efficient use of the resources allotted for the production of results that receives the approval from the stakeholders or the client is called a “successful project”. (Baker et al., 1988) state that there is never truly success in a project there is only perceived success. (Freeman & Beale, 1992) demonstrate that Architects tend to focus on how the building looks while engineers tend to focus on how the building stands up. The idea of project success is difficult to measure because it varies

on who the stakeholders are and when you ask them (DeWit, 1988). Project success was defined differently for each stakeholder but it was based on the general principles of whether project was considered to be successfully completed or met goals/expectations (Parfitt & Sanvido, 1993).

These objectives and standards could cover things like technological, economical, educational, social, and professional matters, among others. It was noted that effectiveness is a synonym for success: the degree to which objectives are achieved (Belout, 1998). According to (Chovichien & Nguyen, 2013) Mention that the project goals are the most acceptable criteria for measuring project success. Anyhow the term 'goals' synonyms with the term 'objectives. (Chua et al., 1999) stated that the project manager, client, contractor, consultant, supplier are the main participants in the project. However, there are multiple sets of project success criteria available but each will not satisfy the varying interests of the construction and property professionals (Wai et al., 2012) so the focus should be on the central people in a project (usually the client will be represented by one or more consultants). The contractor is a very important participant in that they are fully responsible for the success of construction and real estate project. The employees/staff also play a very important role in the achievement of both short-term and long-term goals. Thus, the success of a construction and real estate project can be described as "the extent to which a construction or real estate project meets its planned goals and expectations of all participants"

Project Success Criteria serve as a standard for judging if the project success or failure will be determined (DeWit, 1988) & (Cooke, 2002). (Lim & Mohamed, 1999) refer criterion as a principle or standard by which anything is or can be evaluate. Project success criteria are a collection of guidelines or standards that allow a project to be successfully finished within a given time frame (Chan & Chan, 2001). For this study, definitions provided by (DeWit, 1988) and (Cooke, 2002) will be used. It is agreed that project success must be defined in the initial project planning stages (Baccarini, 1999). Measurement system characteristics include ease of use, reliability of results, quick feedback, action-orientates, economy and efficiency, limited measures, wide data collection, and wide feedback, as mentioned by (Frödell et al., 2008).

2.1.5. Quality in Construction

The subject of quality has been treated from the point of view of Construction and real estate projects. The theoretical literature concerning support for quality management has also been briefly revised. The issues concerning the dimensions of quality management and the success of

construction and real estate project are treated in this section. The review also includes the relationship between quality management and the success project.

2.1.5.1. Quality

It denotes the extent to which a given collection of inherent characteristics meets the requirements. Quality can be used extensively in different situations, and according to the requirements of the people using the particular product, different people may have different perceptions of quality (Almusharraf, 2015). There is no universally accepted definition of quality. Generally accepted definitions of quality include fitness for use, specifications, value for money, services, and psychological considerations (Reid & Sanders, 2011).

The construction and real estate business defines the concept of quality in terms of the needs of numerous stakeholders, including the owner, design professional, contractor, and rule-making authority (Günaydn, 2015). For instance, fulfilling the contractors' demands for the creation of comprehensive plans and contract specifications, fulfilling the design requirements about the distribution of time and budget, and meeting the rule-making needs.

There are two kinds of quality in the building and real estate industry, and they include process quality as well as product quality (Reid & Sanders, 2011). Product quality encompasses to the quality of the tangible product, such as tools or technologies, as well as the quality of the materials that are used in the production of a specific product. On the other hand, the necessity that process quality describes the requirement of a production process to produce either acceptable or defective product. It describes to how a certain project is organized or run throughout the phases during the industry stages where the process of design, construction or operation takes place. Both types of quality are significant in the construction and real estate sector since a product's performance is influenced by both process and product quality.

2.1.5.2. Quality Management

The concept behind quality management is to make sure that every effort is focused towards achieving the required level of quality for the products that are properly planned and organized. From the perspective of a construction and real estate projects, quality management means maintaining the quality of real estate works at a standard that can help achieve customers' satisfaction and as a result, ensure competitiveness and survival for the real estate companies

(Abdul-Rahman & Tan, 2005). Quality management is critically important for a real estate company to sustain its business in today's real estate industry. According to (Harris & McCaffer, 2001), quality management has to ensure that there is an environment where quality tools, techniques, and procedures can be effectively deployed for the success of a company. A construction and real estate company's quality management is crucial to every part of its operations; thus, it cannot be seen as a stand-alone endeavor.

Regarding the implementation of quality management in project management, the ideas of quality planning (identification of quality standards), quality assurance (evaluation of overall project performance), and quality control (monitoring of specific project results) in the quality management processes were explained (PMI, 2021).The implementation process was found to include a number of tools and techniques, including statistical sampling, flow-charting, trend analysis, control charts, Pareto diagrams, cost of quality, design of experiments, benefit/cost analysis, bench marking, and flow-charting. The quality tools and techniques that assist quality programs are divided into three categories: hard quality tools, mixing methods, and soft methods (Mathews et al., 2001). Formal and documented quality systems, quality prices, control charts, and statistical sample standards are examples of hard quality instruments. Reviewing strategy and action plans, adjusting organizational structure, control charts, quality circles, and quality planning tools are all examples of mixed methods. Soft methods are training, customer satisfaction surveys, frequent communication with vendors and external organizations, actions to optimize environment impact, empowerment, self-assessment, and bench marking.

2.1.5.3. Quality Management Processes

The project quality management process is a systematic process of ensuring that the project output meets and, in most cases, surpasses the expectations of the stakeholders. this literature survey is investigated the major frameworks, best practices, and theoretical structures of the project quality management processes. The quality management process begins with the development of a quality management plan that needs to be submitted with the tender documents in the initial stages of the project, as explained by (Rossouw & Smallwood, 2008). There are three major processes involved in the management of quality in the construction industry, as explained by (Nicholas & Steyn, 2008) and (PMI, 2021). These are quality planning, quality assurance, and quality control.

Quality Planning (QP)

QP is essentially a process that will guide future subsequent quality-related endeavors. It specifies the requirements and standards that must be met, as well as the measures necessary to achieve them. The quality of a project is measured by how well it complies with a quality plan that will satisfy customer requirements. According to (Nicholas & Steyn, 2008), quality planning provides assurance that all steps necessary to ensure quality have been thoroughly planned. Quality planning is determining which quality standards are applicable to a certain project and how these requirements might be met (PMI, 2021).

The quality plan would outline the requirements to be fulfilled during each stage of the project, which would require approvals before proceeding to the next phase. It would, for instance, indicate the stage of the project where design reviews could take place, the quality assurance measures to be applied on the tasks done by the subcontractors, and the stage where the project would be inspected, among other requirements (Nicholas & Steyn, 2008). It would also specify the quality procedures to be applied and the phases where they would be used. Checklists are frequently used as part of the quality planning process to guarantee that the whole set of requirements has been met (PMI, 2021). A standardized checklist for the frequent tasks performed would be used by organizations in more developed economies.

Quality Control (QC)

Quality control (QC) refers to the process of monitoring and evaluating the work, and then taking corrective actions so that the quality results that are planned will be achieved (Nicholas & Steyn, 2008). QC is the activities and procedures used to achieve and sustain the quality of a particular product, process, or service by monitoring the activities, detecting, and then removing the quality problems so that the customer requirements are met. consequently, the primary objective of QC is defect of detection. The major techniques of QC are inspection and the use application of the statistical quality control and the application of statistical sampling. The outcome of these processes is then used to take corrective actions and to inform the quality assurance process, so that steps are taken to prevent the same mistakes and defects from occurring again Flowcharts and control charts are other techniques (Kemp, 2006). The goal of inspection is to make sure that what is being produced meets the necessary standards (Harris & McCaffer, 2002). In the construction works, there are two types of inspections, which are quantifiable like, lines, levels, versatility, and

dimensions, and those that are open to the interpretation of the inspector including fitness, tolerance, cleanliness, etc. Quality checks on construction performance are carried out by work supervisors to make sure that they fulfill the standard and specified requirements. The inspections alone cannot prevent or correct errors unless appropriate corrective actions are implemented afterwards. Conversely, statistical sampling is the process of choosing a subset of a population of interest to be examined, tested, or inspected (PMI, 2021). The outcome of tests on a small sample is intended to determine the acceptability of an entire lot or batch of materials or work products (Hendrickson & Au, 2008). Finding out if the batch being tested satisfies a minimum acceptable quality level is the goal. Testing concrete's cube strength is an example of statistical sampling in the construction industry. Sampling has the potential to lower quality control costs (PMI, 2021).

Quality Assurance (QA)

Quality Assurance is a relatively modern approach to the achievement of quality in production. This involves shift away from the conventional approach of inspection or quality control, where the emphasis has changed from the detection and correction of the problem to the prevention of the problem. This enables a definitive and constant improvement in quality. Thus, the purpose of quality assurance (QA) is to reduce errors and mistakes that may produce wastes and defects, thereby preventing rework by replacement and making good on the faults. QA is generally concerned with the prevention of quality concerns through planned and systematic efforts. These consist the implementation of good quality management systems, the assessment and evaluation of the sufficiency of the same, the audit of the operation of the system, and the review of the system itself (Harris & McCaffer, 2002). The planned and systematic approaches carried out inside a quality system to make certain that projects will meet the designated quality requirements are collectively referred to as quality assurance (PMI, 2021). The basic principles of quality assurance are "fitness for purpose" and "right first time," which guarantee that the requirements are fulfilled consistently (Harris & McCaffer, 2002). To make sure that quality has become embedded in the production system, quality assurance focuses on managing production or construction processes and approaches. QA is provided to the management of the project management team or the performing organization in the form of internal QA or to the customers and parties who are not actively involved in the execution of the projects in the form of external QA (PMI, 2021). QA audits and quality planning tools are the fundamental methods utilized to provide QA. Quality

audit is a simple review of the activities of the other quality management functions (PMI, 2021). Quality planning tools, quality audits are the fundamental techniques that are used to provide QA. Quality audit is just a systematic review of other quality management activities (PMI, 2021). A quality audit is a review of the various components of the quality system that is done to ascertain how well these components adhere to the requirements of the quality system. According to (Harris & McCaffer, 2002) the components of a quality system are roles, authority, connections, functions, processes, procedures, and resources. Finding the lesson learned that could be used to enhance the project's performance or any other projects inside the company is the primary goal of any quality audit (PMI, 2021). It is useful for figuring out how well a system functions (Nicholas & Steyn, 2008).

2.1.5.4. Total Quality Management

TQM is the way of life of an organization committed to customer satisfaction through continuous improvement (Okuntade, 2015). however, TQM is also a corporate culture characterized by increased customer satisfaction through continuous improvement in which all employees in the firm actively participate (Olatunji et al., 2012).

The word quality has been interpreted in a variety of ways over time. From a reactive stance, where in the resolution of problems concerning quality, the resolution happens only after the problems are identified, to a proactive stance, where in the inclusion of quality in the design of the product or the process, it happens. The original definition of quality, which placed an emphasis on variation and inspection, is where the application of statistical control procedures through the use of charts originated. It was only later that the importance of quality was recognized in the area of strategies, as a result of the absolute commitment of all levels of the business, including its employees, to the supply of quality. In today's world, all organizations need to focus their aim towards the improvement of quality in order to survive. All successful companies have realized that satisfying customers is critical to their existence and that quality is the source of competitive advantage. Once the total quality aim was focused on satisfying or exceeding the expectations of the customer, the focus of being customer-driven quality approaches.

Companies now believe that implementing TQM effectively increases their competitive capacities and gives them a competitive edge in the market (Anderson & J.C, 1995). Several researchers indicated that TQM deployment resulted in increased quality, productivity, and competitiveness in

just 20-30% of organizations that implemented TQM (Chin S. et al., 2007). The application of TQM results in a 90% improvement in customer satisfaction, operating procedures, staff relations, and financial performance (Rategan, 1992). TQM implementation and its beneficial benefits on organizational performance have been the subject of several researches (Kaynak et al., 2000). TQM implementation in construction companies was described using a basic framework that included a customer feedback system, continuous improvement, teamwork encouragement, a reduction in the number of suppliers, process management and improvement through productivity studies, an efficient communication system, top management, an organizational culture review, training plans, and monitoring procedures (Low & Teo, 2004).

2.1.2 Review of Theory

This study was guided by three theories: Juran's Theory of Quality Management, Deming's Theory of Total Quality Management, and Shenhar, Levy, and Dvir's Four Dimensions of Project Success.

Juran's Theory of Quality Management

Joseph M. Juran is one of the gurus in the field of quality management. This theory has proved that there are three major steps in quality management, termed the quality trilogy. The steps are quality planning, quality assurance and quality control. Regarding quality planning, this theory recommends that Addis Ababa real estate projects identify the client, understand their desires, create product attributes, define quality goals, and construct processes with proven capabilities. Quality assurance Ensuring that processes are correctly implemented to satisfy planned quality standards, as well as ensuring that the plan is carried out correctly before problems develop. As far as quality control is concerned, this theory suggests that real estate projects in Addis Ababa should select the subject of control, select units of measurement, establish measurements, establish standards of performance, measure actual performance, interpret the difference created by actual performance and previously established standards, and perform action to bridge this gap. In addition, the philosophy of quality management by Juran also supports the active role of the senior management in the issues of quality. The theory suggests that it is the role of the senior manager to define the quality standard, formulate the quality policies, determine the quality goals in number and time frame, and provide the resources needed to realize the quality goals. The manager is also expected to define the quality what it means for the project. These theories are applicable in creating an assessment of real estate projects quality management in the city of Addis Ababa.

Deming's Theory of Total Quality Management

Edward Deming is another expert in quality. It closely connects with the ideas of quality planning, assurance, and control. It established the Plan-Do-Check-Act cycle to improve quality. Deming Theory's main proposition is that enhancing quality can increase an organization's production and competitiveness (Nofal et al., 2014). According to Deming, low quality leads to excessive expenses, reducing an organization's market competitiveness. On the other hand, quality improvement results in reduced cost since there is little rework, as well as little waste of material and manpower (Khan, 2010). Maintaining a consistent goal, encouraging continuous improvement, and making sure staff members receive proper training and education are just a few of the fourteen principles outlined in Deming's TQM theory. Deming's concept also places a strong emphasis on the need of leadership in quality management, the value of workers, and the use of statistical techniques to find quality gaps. According to this theory, for real estate projects in Addis Ababa to do the right thing in improving project outcomes, they need to get it right first time to avoid costly reworks, develop long-term relationships with suppliers, introduce on-the-job training programs, embrace new approaches to leadership, create an environment of innovation, and also remove communication barriers. They need to improve processes, replace defect detection systems with defect prevention and continuous improvement systems.

Four Dimensions of Project Success

The Four Dimensions of Project Success is a framework to measure the success of a project (Shenhar, 2001). The framework has identified that there are four dimensions of project success: efficiency, impact on customer, business success, and preparing for the future. The Project Efficiency Dimension is concerned with short-term activities such as ensuring that the projects are finished on time and within budget. In addition, it is concerned with whether the project meets the technical and operational requirements. The impact on customer measures whether customer benefits have been achieved through the project. This dimension measures the outcomes of the projects as opposed to the output of the projects (Kylindri et al., 2012). Its focus is on issues such as whether the customer's needs have been fulfilled, whether the customer uses the product, and whether the customer is satisfied.

2.2. Empirical Review of Literature

There are numerous empirical literatures' regarding the relationship between quality management and project success.

Influence of quality planning on project success

Like any other company activity, quality management efforts in real estate sector need to be properly planned and focused. Strategies and action plans for quality management must complement and work with other organizational efforts in order to be successful. This describes the key elements of quality planning. It is a procedure intended to offer an organized series of tasks meant to enhance and preserve quality (Jayarathna & Senaratne, 2012). According to (Zwikael & Globerson, 2006) studied quality planning practices in various industries and concluded that projects with defined goals, organized timelines, and formalized planning processes were more likely to meet their scheduled, cost, and performance goals. According to this study, the effectiveness of quality planning was crucial in ensuring the desired outcomes of construction projects. It entails providing a road map on how the construction projects will ensure the quality goals. A quality plan that details how the construction project's quality objectives were met the result of the quality planning process. (Globerson & Zwikael, 2004) proposed the "Project Management Planning Quality (PMPQ) model and applied it and validated it through an empirical study involving survey research among project managers. The results of the study established that project success is significantly and positively associated with project planning quality. Moreover, the findings supported the view that not all planning processes have an equal bearing on project success. A good quality management plan should define quality objectives, establish indicators that will act as measures of quality, establish action plans for realizing quality objectives, assign responsibility for each action plan to individuals, and put in place ways through which outcomes will be monitored and evaluated (Bhonde & Shaikh, 2015). It ought to also comprise defining timelines, determining the resources needed for the accomplishment of quality objectives and incorporating milestones. In their research, (Duicu et al., 2013) indicated that by applying quality planning, the success rate of projects was improved since activities involving quality management were well coordinated. Additionally, (Leong et al., 2014) established that the success of the quality plan in projects was ensured through the application of customer-focused quality indicators since it was effective in allowing the achievement of quality objectives. (Githenya & Ngugi, 2014) found

that quality planning was among the factors that played an important role in determining whether there would be implementation of a construction project or not. According to (Ong'ondo, 2016), some of the important issues that should be taken into consideration by project managers are scope statement, performance benchmarks, competence of project team members, and roles of project members. Based on these facts, the following hypothesis is proposed:

H1- quality planning has positive and significant effects on real estate project success in Addis Ababa, Ethiopia.

Influence of quality assurance on project success

Quality assurance is a process focused of quality management. Quality can be introduced to the project right from the very beginning (Goswami, 2015). Quality assurance can include aspects such as, qualified employees, continuing to use only skilled, loyal and committed suppliers, employee/supplier training, increased employee/supplier involvement, verification of the inputs to meet quality requirement and the design of an input verification and design analysis (Bhonde & Shaikh, 2015). The purpose of quality assurance is to remove defects. Various studies have explored quality assurance processes under the framework of project management. In studies performed, it was discovered that several deficiencies exist with quality assurance's implementation under the framework of project management. The deficiencies are lack of formal quality assurance implementation, lack of user involvement, and lack of QA assessments. Despite these limitations, quality assurance has proven to be successful in construction projects. The chance for success in the construction of project can be increase by implementing Quality assurance since it provides a certain confidence to the project completion. According to the report from (Alshamamri, 2013) establishing a dedicated department for quality assurance implementation is the method for embedding quality assurance culture in project management. It was also found that a lower number of defects tends to make the transition phase from construction to commissioning & qualification a smooth one thus enabling the project to achieve the time & cost objective (Mallawaaracchi & Senaratne, 2015).

In the construction management literature, the importance of quality assurance has been demonstrated by several empirical researches. for example, according to (Love et al., 2000) discovered that inadequate quality management techniques greatly increase rework, which raises project expenses and delays. In the same way, (Arditi and Gunaydin, 2007) emphasized that using

quality assurance procedures in building projects improves client satisfaction and project performance as a whole. This showed that the project had a very robust quality assurance system which would aid the project team in the reduction of the number of defects. Based on the facts presented in the report, the following hypothesis is proposed:

H2: quality assurance significantly influences real estate project success in Addis Ababa, Ethiopia.

Influence of Quality control on project success

Quality control is also an activity that is significant when it comes to managing the quality of projects. Quality control is defined as reviewing and evaluating the outputs of projects in a bid to determine whether they conform to certain standards or not (Goswami, 2015). However, in case it is determined that the outputs do not conform to the standards as desired, then it is up to the quality control officer to take corrective action. In this regard, corrective action in the context of construction projects could be in the form of redoing some of the building projects. However, this is an important process in quality management. This is because it is not possible to ensure 100% prevention of defects in projects. (Reyes, 2012) has recommended some best practices in the implementation of quality control in construction projects. These include creating an entity named Quality Control Inspection, employing qualified personnel to work in this entity, and creating inspection schedules. The author further suggested that the Quality Control and Inspection team should determine the level of non-conformance requiring corrective actions in order to ensure the efficiency of project execution. (Arachchi et al., 2015) argued that one of the factors that determine the successful implementation of ERP is the role of quality control since it enables the identification and corrective actions of potential weaknesses that can affect the data of the ERP system. In their research. Among the aspects examined by (Githenya & Ngugi, 2014), observed that there was a very strong association between quality control and construction project implementation. According to (Wambugu, 2013) the supply of quality material is a significant factor that determines the success of construction projects. It is noted that the material supply factor impacts the projects, and there is a reduction in motivation of workers due to the delay of projects, which leads to low productivity. Based on these facts, the following hypothesis is proposed as:

H3: quality control has a positive and significance effect on real estate project success in Addis Ababa, Ethiopia.

2.4. Conceptual Framework

Like other industries, the real estate sector has experienced some challenges which have an effect on its performance and production. Based on literature related to this study, it can be summarized that QM has a positive and direct effect on project success. QM procedures are represented by quality planning, quality assurance, and quality control Based on this understanding, the conceptual framework was developed in a way that having three dimensions of QM procedures were considered independent variables, and project success was considered dependent variables. As depicted in figure 1, QM procedures have direct relationship with project success. This model adapted Baldrige criteria cited by (Jha & lyer, 2006) to measure the influence of quality management on project success.

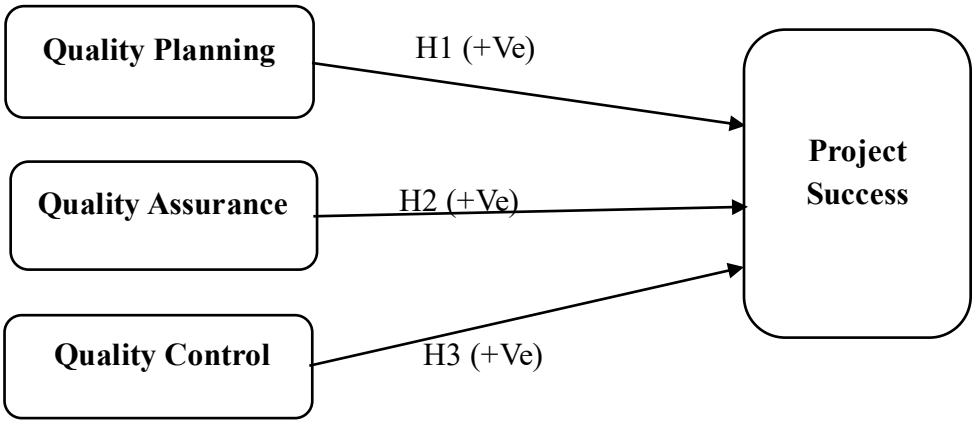


Figure 1 Conceptual Framework

(source: adapted from Jha & lyer, 2006)

This conceptual framework provides a methodical way to comprehend the key components of project success and quality management. The conceptual framework of the study is developed using the Plan-Do-Check-Act (PDCA) cycle as the theoretical basis. The PDCA cycle, a continuous improvement framework that is now often used in project management and quality management procedures, was initially presented by W. Edwards Deming. Quality planning is carried out during the plan phase, which entails setting project goals, quality standards, and procedures before the project is carried out. As indicated by the quality assurance practice, the Do

phase of project execution is symbolic of the execution of scheduled quality activities. According to quality control, the check phase consists of monitoring and analyzing project outputs to verify they meet the needed requirements. Finally, the Act phase emphasizes ongoing improvement and corrective measures that add to the project's overall success.

2.5. Hypothesis

H1: The effect of Quality planning on project success is statistically significant and positive.

H2: The effect of Quality assurance on project success is statistically significant and positive.

H3: The effect of Quality control on project success is statistically significant and positive.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter provides a detailed explanation of the research design and methodology. It discussed in the following sections: research design, research approach, target population, sample size, sampling technique, data collection instrument, data validity and reliability, data analysis method and ethical consideration.

3.2. Research Design

Based on purpose, research design is classified into three main categories such as descriptive, exploratory, and explanatory research (Lewis et al., 2014). Descriptive research is commonly concerned with describing a population in relation to key variables. The aim of exploratory research is to discover ideas and insights whereas, explanatory research is employed in establishing cause and effect relationships among variables. This is a causal analysis, which focuses on the study of the effect of one or more variables upon the changes in another variables. It is, in turn, a study of functional relationships which may exist between two or more variables. Then, the study applicable for explanatory research design for the reason that it intends to examine the relationship between quality management and the success of project. Because an explanatory research design tries to determine cause and effect relationships among the variables to investigate functional relationships (Kothari, 2014).

3.3. Research Approach

This study is deductive research that starts by reviewing existing literature and theory to formulate hypothesis and then collect data to test hypothesis. There are three approaches of research: quantitative, qualitative and mixed (Creswell, 2009). The study was an investigation of the effect of quality management on project success, entailing the relationships among the three dimensions of QM and their impact on project success. Among the aforementioned approaches, then, quantitative research was applied to this study, as (Genner, 2018) explains that when testing a theory and explanation, quantitative research is the best approach to apply. Thus, applying the

quantitative research approach was considered appropriate because quantitative research is a means for testing objective theories through the examination of the relationship among variables.

3.4. Sampling Design

3.4.1. Population and Sampling Frame

Target population is described as a specific set of individuals for which questions can be answered or observations can be made to generate required data (Hair, 2010). The target population of this study comprised professional staff involved in real estate projects within private real estate companies in Addis Ababa. Data from Addis Ababa Investment Agency indicates that there are 23 private real estate companies currently active in the city (Yohannes & Dinku, 2024). Private real estate companies are selected based on specific criteria to ensure their relevance to the research objectives. The study focuses on private real estate companies that: have multiple ongoing and completed projects, maintain regular project staff allowing for examining quality management procedures, possess at least five-year experience, have large- scale impact within the city. within these firms, projects were also chosen purposively based on their relevance to the study. The selection criteria for projects included on ongoing projects, mixed-use buildings and large scale with multiple blocks. According to the defined criteria, three (3) private real estate companies and nine (9) real estate projects were selected and then contacted. These projects had a total population of 164. The sampling frame was made up of a list of professional staff from the selected projects.

Table 3.1 Target population size for selected real estate projects

AYAT REAL ESTATE	CC project	33
	Zone 2 project	16
	Zone 8 project	21
GIFT REAL ESTATE	Legehar project	16
	CMC project	13
	22 Mazoriya project	17
	4 Kilo (Tiyt bet) project	20

OVID REAL ESTATE	Gulela project	13
	Bole Medhaniyalem project	15
Total		164

Sample size

The target population for this research includes professionals of building projects employed by the real estate projects. The sampling frame for this study comprises lists of building professionals obtained from selected real estate projects. In order to ensure that the chosen sample appropriately represents the target population, The sampling frame was developed by collecting lists of building professionals directly from the selected projects and consulting with project workers. The population of the study consisted of professionals working for three (3) selected real estate companies. Within these firms, nine (9) building projects are currently ongoing. Multiple building professionals working in various capacities were involved in each project. Consequently, the study's total population consists of one hundred sixty-four (164) building professionals from the three organizations in nine real estate projects. A statistically representative selection of employees from the target population is essential (Yamane, 1967). The formula created by Taro Yamane (1967) was used to calculate the study's sample size at a 5% precision level and 95% confidence level. First, we should be working with a known limited population size. The Yamane formula for calculating the sample size is as follows:

n= required sample size

N= Total population size

e= is the estimated standard error which is 5% for 95% confidence level.

$$n = N / (1 + N(e)^2)$$

Where

N = 164 $\quad$ $n = 164 / (1 + 164(0.05)^2)$

e = 0.05 $\quad$ $n = 134 / (1 + 164(0.0025))$

$$n = 164 / (1 + 0.41)$$

$$n = 164 / 1.34 = 116 \text{ respondents}$$

3.4.2. Sampling Unit

In this study, the units of sampling are individual building professionals such as project managers, site engineers, office engineers, consultants and foreman who are directly involved in the selected projects. data are collected from these professionals to analyze the significance of quality management towards project success.

3.4.3. Sampling Techniques and Procedure

The researcher applied the use of a multistage sampling method. In the first stage, the study analyzed private real estate companies according to the criteria indicated in the target population section in order to determine companies that could be suitable for the study. Given that the total number of eligible private real estate companies was 3. Because the research is aimed at analyzing private real estate companies that fit the criteria of the study objective.

In the second stage, projects under the selected companies were chosen based on the criteria outlined in target population section. The selected projects are related to the objectives of the study According to the above-mentioned criteria, nine real estate projects were selected from the three private real estate companies.

Stratified sampling technique was applied in the third stage to select professional staff within the selected projects. At the beginning employees were categorized into strata depending on their professional role within the projects including project managers, site engineers, office engineers, and foreman. Through doing this, the study considered the involvement of various professional categories who are involved in the implementation of quality management and project activities. Therefore, it became possible to get the views of professional staff about the quality planning, quality assurance and quality control and success of the project.

Table 3.2 Target population and sample size for the study

Projects	N	Role	N	Sample size	
CC project	33	Project manager	3	2	24
		Consultant	3	2	

		Site engineer	10	8	
		Office engineer	7	5	
		Foreman	10	7	
ZONE 2 PROJECT	16	Project manager	2	1	11
		Consultant	3	2	
		Site engineer	4	3	
		Office engineer	2	1	
		Foreman	5	4	
ZONE 8 PROJECT	21	Project manager	2	1	15
		Consultant	3	2	
		Site engineer	6	5	
		Office engineer	3	2	
		Foreman	7	5	
LEGEHAR PROJECT	16	Project manager	2	1	11
		Consultant	2	1	
		Site engineer	4	3	
		Office engineer	2	1	
		Foreman	6	5	
22MAZORIYA PROJECT	17	Project manager	2	1	12
		Consultant	2	1	
		Site engineer	5	4	
		Office engineer	3	2	
		Foreman	5	4	
CMC PROJECT	13	Project manager	2	1	8
		Consultant	2	1	
		Site engineer	3	2	
		Office engineer	2	1	
		Foreman	4	3	
4 KILO	20	Project manager	2	1	15

TIYTBET PROJECT		Consultant	3	2	
		Site engineer	5	4	
		Office engineer	4	3	
		Foreman	6	5	
GULELA PROJECT	13	Project manager	2	1	8
		Consultant	2	1	
		Site engineer	2	1	
		Office engineer	3	2	
		Foreman	4	3	
BOLE MEDHANIYALEM PROJECT	15	Project manager	2	1	10
		Consultant	2	1	
		Site engineer	3	2	
		Office engineer	4	3	
		Foreman	4	3	
TOTAL	164				116

Simple random sampling technique (lottery method) was used after the division of the population into strata to get the final respondents to complete the questionnaire. This technique made the selection more representative since each individual in each stratum had the same chance of being selected. Using such sampling technique helps in ensuring that each individual in the group comprising not more than 30 staff members have an equal probability of being selected for participation. The total population in the selected real estate projects was 164 and the sample size of the study was 116.

3.5. Data Source and Collection method

For this research study, primary sources of data were utilized and collected using a structured questionnaire to get standardized answers from all participants systematically. the most significant data gathering tools identified for this research study are Questionnaires. To gather the necessary information, a questionnaire will be developed using a five-level Likert scale, as recommended by

(Cooper & Schindler, 2008). It shall be used for developing the questionnaire to obtain the information required in the research study. The Likert scale will be utilized in this research study because it measures the attitude of the respondent based on a scale ranging from 1 to 5. Closed ended questionnaires shall be utilized as the primary instrument for collecting primary data. The primary data collected will undergo checking, filtering, and then entry for further statistical analysis. Descriptive and inferential analysis shall be utilized for data statistical analysis by using methods such as ranking, weighted average, mean, standard deviation and regression analysis. These analytical techniques helped drive meaningful insights from the collected primary data.

3.6. Validity and Reliability of Instruments

validity

Validity test is the process of determining a research instrument accurately measures what it is meant to measure. The questionnaire used to conduct this study was adopted from previous research that assessed the same construct.

Reliability

The reliability test evaluates a property or construct's consistency**.** The pilot test was conduct to evaluate the legibility and reliability Before releasing the final questionnaire to the respondents by calculating Cronbach's alpha value for each questionnaire item. It is appropriate to use the scale if the alpha value is larger than or equal to 0.7 (Tavakol & Dennick, 2011). For quality planning, quality assurance, quality control and project success. These findings were generated using SPSS.

Table 3.3 Cronbach's alpha values

Variables	Cronbach's alpha
Quality planning	0.906
Quality assurance	0.889
Quality control	0.833
Project success	0.836

Source: Survey Data, 2026

3.7. Methods of Data Analysis

Both descriptive and inferential statistics analyze the quantitative data gained through structured questionnaire. Descriptive statistics shall be used to describe the usefulness of the data set to describe preliminary descriptive statistics mean, standard deviation, frequency, and percentage. Inferential analysis shall be used to examine the relationship and impacts of the variables. Inferential analysis included Pearson correlation analysis to examine the strength and direction of the relationship between quality management dimensions and project success. The foremost useful of this kind of analysis is meant for hypothesis testing and regression analysis. So, to determine the effect of quality management on project success, multiple regression analysis determined the different causal relationship that was conducted when two or more variables are used. This technique allowed to examine the contribution of quality planning, quality assurance and quality control to the overall success of projects. The multiple linear regression models are specified as:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_n x_n + \varepsilon$$

Where:

- Y = is the measured value of project success or the value of the dependent variable
- Independent variables

  x_1= The measured value of Quality Planning

  x_2 = The measured value of Quality Assurance

  x_3 = The measured value of Quality Control

- β_0 = Constant term (coefficient of intercept)
- $\beta_1 \beta_2 \beta_3$ = Coefficients of the independent variables (regression coefficient).
- ε = Error term

  β represents the coefficients of independent variables, X represents column vectors for quality planning, assurance, and control, and ε represents prediction errors.

3.8. Interpretation and Result

The analyzed data will be interpreted through the study of statistical results. The findings will be examined within the context of the research questions and objectives. It will be expected that the research will add to the current body of knowledge by offering actual data regarding the impact of quality management more especially, quality assurance, quality control, and quality planning on real estate project success. Furthermore, the regression is intended to demonstrate how each area of quality management contributes to project success on their own. It will indicate that projects can improve project outcomes by upgrading their quality management systems.

3.9. Ethical Consideration

Ethical consideration for the research entails a series of guidelines that control your research activities. The researcher was instructed that all actions conducted by the participants during data gathering would be done on a voluntary basis. By this process, the respondents remain out of harm and will be guaranteed freedom at all costs that they can withdraw anytime with no consequence at all. In ensuring that the confidentiality of the data being driven by the respondents is maintained, the respondents were not asked to write their names among those who conducted the data gathering.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND INTERPRITATION

4.1 Introduction

This chapter provides information obtained from the gathered data in a study on the effect of quality management on project success on real estate projects in Addis Ababa. The questionnaire was adopted to gather primary data. IBM SPSS version 27 was used for the statistical analysis. After carefully examining the results in considering the study objectives, the study finding was organized and presented in tabular format. Multiple regression, inferential statistical methods, and correlation analysis were used to investigate the relationship between the variables.

4.2. Response rate

Structured questionnaires were administered to 116 randomly chosen respondents out of which 108 returned the questionnaires after completion. As a result, it was clear that the questionnaires that had been returned were suitable in addressing the study objectives considering that they constituted 93% of the total number of respondents.

4.3. Demographic Characteristics of the Respondents

In order to describe the sample and provide readers a better understanding of the findings in this subsection, the researcher tried to examine the personal data of demographic information. The demographic analysis examines the respondents background information, such as their gender, age, educational background, Occupational role and work experience. The structured answers to the survey were obtained and presented in the table.

Table 4.1 Respondents' gender distribution

Gender	Frequency	Percent
Male	73	67.6
Female	35	32.4
Total	108	100.0

Source: Survey Data, 2026

As per Table 4.1 the results reveal that the male respondents are higher than female respondents. As illustrated, 67.6% of the total respondent are male, whereas 32.4% of are female. This distribution shows the relative participation of men and female with in labor force. This implies that the professionals who were mostly participating in the project were males, an indication that the real estate industry in Addis Ababa, Ethiopia is male-dominated.

Table 4.2 Respondents' age level

Age	Frequency	Percent
21-29	34	31.5
30-40	61	56.5
41-50	13	12
Total	108	100.0

Source: Survey Data 2026

As shown Table 4.2 the majority (56.5%) of the respondents are between the ages of 30-40. The other (31.5%) are between the age of 21-29, while the remaining (12%) of the respondents are age group of 41-50 years. The age distribution of the participants may influence the knowledge transfer process as well as the quality management processes within the project. As is stated in the results, the survey should include more active young people. As (Patrick, 2006) states, productivity increases with age until 40 years old and remains stable above that age. Therefore, their responses are useful for assessing the implementation of quality management practices and their effect on project success in the selected real estate projects.

Table 4.3 Respondents' educational level

Educational level	Frequency	Percent
Graduate (MSC)	31	28.7
Under graduate (BSC)	69	63.9
Diploma	8	7.4

Total	108	100.0

Source: Survey Data,2026

From the Table 4.3 the educational profile of the respondents shown the large group hold bachelor's degree (63.9%), while (28.9%) had a master's degree. A smaller group of respondents (7.4%) a diploma. Collectively, 92.6% of the participants had at least a first degree. this high level of academic proficiency suggests that the respondents have intellectual background to undertake and accurately interpret projects in the real estate developments.

Table 4.4 Respondents' experience level

Experience	Frequency	Percent
0-5 years	38	35.2
6-10 years	43	39.8
10-15 years	24	22.2
Above 15 years	3	2.8
Total	108	100.0

Source: Survey data, 2026

From table 4.4, it shows that the total respondents, 39.8% of the employees have 6-10 years' experience category, representing 39.8% (n=43) of the total respondents. This followed by respondents with 0-5 years of experience, who constitute 35.2%(n=38). Furthermore, 22.2%(n=24) of the participants reported having 10-15 years of experience, while the remaining 2.8% (n=3) have been in the industry for above 15 years. The above information is important since 64.8% of the respondents have over five years' experience. many experienced employees are included in the survey response. Therefore, participants involved in the study have practical skills. Consequently, information provided on quality management and success of projects is credible.

Table 4.5 Respondents' position level

Position	Frequency	Percent
Project Manager	8	7.4
Consultant	13	12
Site Engineer	32	29.6
Office Engineer	19	17.6
Foreman	36	33.3
Total	108	100.0

Source: Survey Data,2026

Table 4.5 shows that the respondents were asked about their occupations. Extremely high occupational diversity can be observed for all the respondents under study. To start with, there are Foreman who constitute 33.3% (n=36) of the respondents, then come Site Engineers who make up 29.6% (n=32) of the respondents. Other types of occupations include Office Engineers, which make up 17.6% (n=19) of the respondents, Consultant and Project Manager constituting 12% (n=13) and 7.4% (n=8) of the respondents, respectively. It is important to note that the research must feature very high occupational diversity. their response is relevant and can help with the research on quality management and how projects success.

4.4 Descriptive statistics

This section discusses the descriptive statistics for the research variables which include Quality planning, Quality assurance, Quality control and Project success. It is important to mention here that the descriptive statistics have been derived on the basis of average score value (mean) and Standard deviation (SD). Below is the scale which has been devised for interpreting the results of the research. To understand the results obtained from the questionnaire, the scale discussed below will be used. The scores of 1.00 to 1.80 will show the "Strongly Disagree" opinion about the topic

being researched while scores between 1.81 to 2.60 will suggest the "Disagree" opinion. Similarly, scores of 2.61 to 3.40 will denote the "Neutral" opinion while scores between 3.41 to 4.20 will denote the "Agree" and opinion 4.20 to 5.00 as Strongly agree (Sözen & Güven, 2019).

Quality Planning

Table 4.6 Descriptive statistics for Quality Planning

Items	N	Mean	SD
The Project has well written and documented quality plans	108	3.96	.906
Quality plan defines the specific quality goals and objectives for the project	108	3.78	.941
The quality plan clearly stipulates the actions the project team intends to take to achieve quality goals	108	3.02	.917
Quality plans stipulate ways for evaluating the implementation of the plan	108	3.06	.936
Senior managers are actively involved in the developments of quality plans	108	3.19	.855
Line employees and clients are engaged in the development of quality plans	108	3.34	.888
Aggregate mean	108	3.39	.907

Source: Survey Data, 2026

The above table 4.6 shows that the respondents' perception of Quality planning is positive concerning the initial documentation of real estate projects within the study area. the obtained (mean = 3.96; SD = 0.906) shows that all projects are very well-written and documented in terms of quality planning. This fact implies that the developers in the area tend to follow quality management norms quite formally. Another point, which was agreed upon by the employees was that their quality plans were able to define goals and objectives of their real estate projects (mean = 3.78; SD = 0.941). Nevertheless, the collected data indicates a significant change in respondents' opinions regarding the procedural side of quality planning. Namely, respondents expressed

uncertainty about the clarity of actions, which should be performed to achieve the set quality goals in real estate projects (mean = 3.02; SD = 0.917). Thus, it appears that while documentation is rather well-developed, the plan itself leaves much room for improvement regarding the stipulation of actions that should be performed. Similar conclusion can be made based on another question that received the score of (mean = 3.06; SD = 0.936). It can be assumed that respondents had some difficulties evaluating implementation of the developed plans due to its lack of clarity. collaboration was evaluated rather neutrally (in terms of means) during the survey.

the senior managers are involving in quality planning process received a rating of (mean = 3.19; SD = 0.855), while line employees and clients scored slightly higher (mean = 3.34; SD = 0.888). Thus, there is evidence of insufficient involvement of all parties concerned in development of the plans in the area. More collaboration will contribute to the increase of effectiveness of quality planning in real estate projects.

In conclusion, the aggregate mean (mean = 3.39; SD = 0.907) suggests that quality planning is a process that is evaluated by respondents as a neutral one. Although the documentation is quite satisfactory in the field of real estate development, the process of quality planning still requires stipulation of clear actions and more collaboration between all stakeholders.

Quality Assurance

Table 4.7 Descriptive statistics for Quality Assurance

Items	**N**	**Mean**	**SD**
The project has a quality assurance plan to monitor and control project quality	108	3.03	.767
The company has structured system for recruiting construction workers	108	3.06	.841
The company has elaborate programs for improving workers capacity and engagement levels	108	3.04	.696
The company has a well-structured system for vetting and selecting suppliers	108	2.94	.800

The company has comprehensive programs for improving suppliers' capacity and engagement level	108	3.12	.806
The project has effective system for evaluating design and engineering drawings	108	3.11	.728
Aggregate mean	108	3.05	.773

Source: Survey Data, 2026

The above table 4.7 shows that the respondent attitude towards all processes mentioned is on a neutral level. When talking about using quality assurance planning tools in order to control and monitor the project quality, we should mention that the mean is quite neutral (mean =3.03; SD =.767). That means that the respondents doubt the presence of such quality assurance planning tools within the project. The similar situation can be observed in regard to recruitment of construction workers because it is quite average (mean = 3.06; SD =.841).

In regard to the processes related to people and partnering management, we may see the neutral attitudes as well. Thus, according to (mean = 3.04 with SD=.696), it can be claimed that employees believe that there are no programs aimed at enhancing people and partnering issues within the project. The lowest mean is observed when talking about the system for evaluating suppliers (mean=2.94; SD =.800). Such standard deviation means that despite the fact that the average opinion is neutral, different people think differently in regard to this process.

What concerns internal technical reviews, we may notice that the mean is not high (mean = 3.12; SD =.806). That means that the program to enhance supplier capacities is quite average. In addition, the mean concerning the system for reviewing design and engineering drawings equals to 3.11 with SD=.728. Such standard deviation implies that most employees share one point of view in regard to the process being discussed.

Thus, the aggregate mean of 3.05 with SD=.773 indicates that Quality Assurance is on the neutral level. As one can observe, although these systems exist, they are still far from perfection. Hence, there is the need to work out some strategies in order to obtain good results while dealing with real estate projects.

Quality Control

Table 4.8 Descriptive statistics for Quality Control

Items	N	Mean	SD
The project has independent quality control and inspection (QCI) teams to monitor quality standards	108	3.15	.771
The project has an inspection schedule created to monitor quality throughout its execution	108	2.94	.823
The project allocates adequate resources to its quality control and inspection (QCI) teams	108	3.03	.779
The project applies statistical methods to identify and monitor quality variations	108	3.16	.833
The project takes corrective measure whenever quality gaps are identified during inspections	108	3.16	.888
Senior managers are actively involved in project quality control activities	108	3.22	.789
Aggregate mean	108	3.11	.804

Source: Survey Data, 2026

The above table 4.8 shows that there is a consistent pattern of neutrality among all indicators. First of all, the existence of independent quality control and inspection (QCI) teams was rated at (mean = 3.15; SD = .771). It can be argued that while such teams exist in these projects, their independency or effectiveness does not receive much recognition among respondents. In addition, the existence of an inspection schedule obtained the lowest score of the group (mean = 2.94, SD = .823), which implies that respondents cannot positively evaluate the systematicity of inspections during projects' performance.

Another critical issue related to quality monitoring is associated with the tools available for monitoring this process. The allocation of proper resources to the activity obtained (mean = 3.03;

SD = .779) from respondents. The latter clearly stated that they have a neutral opinion about it. Also, the application of statistical methods for quality variations identification was evaluated by respondents (mean = 3.16; SD = .833), which means that such an approach is neither widespread nor unpopular among workers.

In addition, the analysis revealed that there are no major concerns in relation to how quality problems are being handled in these real estate projects. Corrective actions that can be implemented if any quality problem was discovered in the process (mean= 3.16; SD = .888), which means that respondents remain neutral regarding this aspect. Finally, the engagement of top managers in QCI obtained the highest mean value of the category (mean = 3.22, SD = .789). However, even in this case, the score remained neutral, which means that managers perform this task rather passively.

Summing up, the aggregate mean on the QC variable of 3.11 (SD = .804) confirms the conclusion that respondents are generally neutral towards the quality control activities in these real estate projects. According to these findings, it can be assumed that although the necessary tools for conducting quality control are available, the inspected process lacks some rigidity and efficiency. To improve projects' quality, developers should move this process to the next level and implement more active control and management measures.

Project Success

Table 4.9 Descriptive statistics for Project Success

Items	N	Mean	SD
The project is completed within the scheduled timeline	108	3.18	.863
The project is completed within the authorized budget and financial constraints	108	3.16	.763
Clients are satisfied with the outcome of the project	108	3.24	.682
Projects meets with all technical quality standards and specification	108	3.06	.734

Lessons learned from previous projects are applied to the success of subsequent projects	108	3.12	.794
Aggregate mean	108	3.15	.767

Source: Survey Data, 2026

The above table 4.9 shows that all dimensions of project success in the studied real estate projects are neutral. With regard to the fundamental constraints of project management, the mean of 3.18 (SD = .863) indicates neutrality of the view on completion of the projects within the planned deadlines. In the same way, the mean of 3.16 (SD = .763) denotes neutrality with regard to staying within the authorized budget limitations. The obtained results mean that, although there are no failures, it can be stated with certainty that there is not enough efficient management of time and finances.

The same concerns stakeholder satisfaction and technical performance. Thus, the mean of 3.24 (SD = .682) denotes neutrality with regard to clients' satisfaction with the project results, even this largest score suggests that more efforts are needed to provide for high client satisfaction. Also, the mean of 3.06 (SD = .734) is indicative of neutrality with regard to compliance of the projects with all technical requirements. This aspect is especially important in the case of the construction projects since it relates directly to their safety and quality.

Finally, it was established that organizational learning is viewed by the respondents as neutral; the mean of 3.12 (SD = .794) denotes neutrality of views on application of lessons learned in the earlier projects. The obtained result suggests that there are no systematic attempts to apply experience accumulated in the prior projects to the ongoing ones.

As the aggregate mean of 3.15 (SD = .767) indicates, overall Project Success is viewed as neutral. It means that, on the whole, there are some successful factors in the project, which cannot provide for decisive success in terms of timely completion, staying within budget, and ensuring technical superiority of the projects. In order to increase the rate of success, additional efforts should be undertaken in terms of financial management, schedule, and application of the prior experience.

4.5 Correlation analysis

In this study, the correlation analysis method is used to analyze the existence of the relationship between the quality management dimensions including quality planning, quality assurance, and quality control and the success of the project. Correlation between each variable is depicted by the use of correlation coefficients that range between −1.00 and +1.00. Based on the interpretation of Pearson correlation coefficient, a positive sign implies a positive relationship between two variables while a negative sign represents an inverse relationship.

Table 4.10 Pearson Correlation analysis result

Pearson Correlation				
	QP	QA	QC	PS
QP	1			
QA	.758**	1		
QC	.830**	.831**	1	
PS	.848**	.884**	.880**	1
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Survey Data, 2026

As shown in Table 4.10 there is a significant positive correlation between quality planning and project success (r = 0.848; p = 0.000). There is a significant strong positive correlation between quality assurance and project success (r = 0.884 and p = 0.000). there is a significant positive correlation between quality control and project success (r = 0.880 and p = 0.000).

On the whole, all dimensions of quality management have significant strong positive correlations with project success. All the relationships are very significant because of the low p-values (p = 0.000). All these findings show that quality planning, quality assurance and quality control are positively correlated with project success. Given the above results, it is worth discussing the association between quality management dimensions and project success further in the next section through regression analysis.

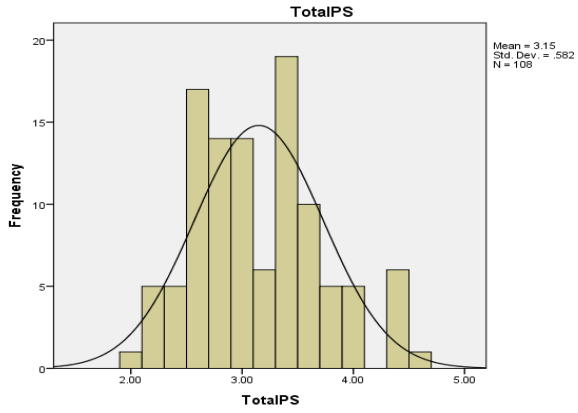
4.6 Regression Analysis

Multiple regression analysis was performed to find out the magnitude and direction of the correlations found using the correlation analysis. In this study, the use of regression analysis has been done to find out the causative effect of quality management dimensions such as quality planning, quality assurance, and quality control on the project success. All these three factors have been regarded as the independent variables, whereas project success has been taken as the dependent variable. Moreover, the significance and direction of the effect of each of the dimensions on project success have been measured.

4.6.1 Assumptions and tests

Normality test

The validity of the regression analysis rests upon the fulfillment of two basic assumptions, including the normality and linearity. In this regard, we have already tested the normality assumption visually and statistical. For this purpose, we made use of the histogram technique as well as the descriptive statistical analysis. Normality can also be examined by means of P-P plots. If the histogram is of bell shape, it indicates that the residual distribution is normally distributed. The normal distribution of residuals is extremely important since the regression analysis assumes a normal error component about the fitted estimates. It can be observed from Figure 4.1 that the success of projects is normally distributed relative to quality management dimensions



Source: Survey Data, 2026

Figure 2 Histogram

Table 4.11 Normality test

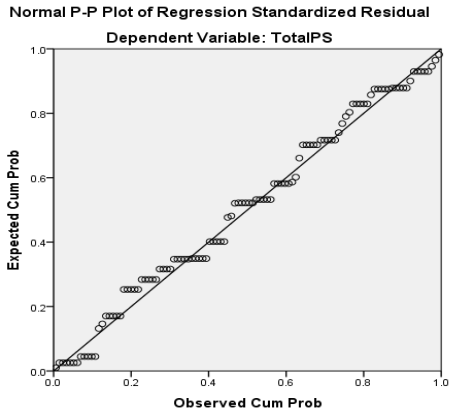
	N	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Total QP	108	3.3904	.445	.233	-.695	.461
Total QA	108	3.0478	.975	.233	.571	.461
Total QC	108	3.1080	.872	.233	.028	.461
Total PS	108	3.1500	.436	.233	-.310	.461
Valid N (listwise)	108					

Source: Survey Data, 2026

Data normality test was carried out by use of descriptive statistics and normal p-p plot approach. Table 4.11 shows that skewness value falls in the range of 0.436 to 0.975 within international standards of -1 to +1. Likewise, kurtosis values fall in the range of -2 to +2, indicating that the normally distribution is present in the data. from the above discussion, it can be noted that there is normality in the data set.

Linearity test

The linearity assumption holds true when plotting the dependent and independent variables against each other on a scatter diagram displays a linear pattern in which most of the data points fall along a straight line. In addition, the distribution of residuals should not show any pattern but appear randomly placed above and below the horizontal straight line for the results of linear regression to be considered valid. The purpose of linearity test is to measure how consistently project success (dependent variable) reacts to changes in the quality management independent variables (quality planning, quality assurance, and quality control). Residuals obtained through regression analysis in this research work were computed and plotted in SPSS software.



Source: Survey Data, 2026

Figure 3 Normal P-P plot

Multi collinearity test

Table 4. 12 Multi collinearity test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Total QP	.297	3.370
	Total QA	.294	3.398
	Total QC	.215	4.645

a. Dependent Variable: Total PS

Source: Survey Data, 2026

Multicollinearity diagnosis was performed in order to ascertain whether there existed any issue of multicollinearity among the independent variables. As indicated in table 4.12 below, the tolerance level for the independent variables ranges from 0.215 to 0.297, a level which exceeds the required minimum level of 0.20 and greater than 0.10. Moreover, the Variance Inflation Factor (VIF) level for the independent variables is all below 10. Therefore, there exists no issue of multicollinearity among the independent variables.

Checking the assumption Model Summary for Regression Analysis

Table 4.13 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.870	.20947
a. Predictors: (constant), QP, QA, QC				
b. Dependent Variable: PS				

Source: Survey Data, 2026

The importance of the R value of 0.935 in the regression model presented above is that it shows the existence of positive correlation between all independent variables and the dependent variable. This implies that there exists a very strong positive correlation between the predictors in the regression model above and the dependent variable in the regression model above. The value further suggests that all the independent variables combined can predict 87.4% of the variation in the dependent variable as it stands since the R Square in the regression model above is 0.874.

When we adjust the R Square in relation to the number of independent variables included in the above regression model, then we obtain the value of Adjusted R Square. The adjusted R Square is therefore used to measure the proportion of variance in the dependent variable which can be predicted by the regression model above. From the regression model above, the Adjusted R Square is 0.870. This means that the amount of variance which can be explained by the regression model above is 87.0%.

In summary, from the above regression model, the results suggest that quality planning, quality assurance, and quality control are positively correlated with project success. Thus, organizations should consider incorporating quality in their projects through quality planning, quality assurance, and quality control.

ANOVA summary interpretation

Table 4. 14 ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.687	3	10.562	240.725	.000[b]
	Residual	4.563	104	.044		
	Total	36.250	108			
a. Dependent Variable: PS						
b. Predictors: (Constant), QP, QA, QC						

Source: Survey Data, 2026

Regression model with quality planning, quality assurance, and quality control as predictor variables proves statistically significant in explaining the project success variable using the provided information in the ANOVA table. The fact that F=240.725 means that the regression model has relatively more variance in explaining the dependent variable compared to the error term of the independent variable. In addition, since the significance level (Sig.=0.000) is less than 0.05, then this is an indication that the regression model is statistically significant. Therefore, at least one of the independent variables (QP, QA, and QC) substantially affects the dependent variable (PS). Moreover, from the above table, since the value of F is greater, then this means that the regression model has relatively good predictive ability in explaining the variation in the dependent variable. However, it is important to note that the ANOVA table does not indicate the independent variable with maximum influence on the model. Therefore, coefficient analysis should be performed to determine such independent variable.

4.6.2 Result of Multiple Regression coefficient

Parameter estimation and interpretation

Having carefully reviewed the assumptions, parameter estimation followed by analysis was done to determine the effect of quality management components directly on project success. These findings, together with their discussion, are contained in the section below.

Table 4. 15 Regression Result Showing the Effect of quality management on Project success

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.034	.122		.277	.782
	Total QP	.271	.061	.284	4.448	.000
	Total QA	.453	.067	.432	6.741	.000
	Total QC	.263	.069	.285	3.801	.000
a. Dependent Variable: Total PS						

Source: Survey Data, 2026

The effect of quality planning on project success

The quality plan (B = .271, p =.000) has a significant and positive influence on project success (there is no p-value greater than 0.05). In other words, the greater quality plan in real estate projects, the greater project success. Therefore, attempts to achieve quality planning will be fruitful for organizational project success.

It is shown that the empirical finding demonstrates the existence of statistical significance and positiveness of the relationship between quality planning and the success of projects. As a result, the impact of quality planning on the increase of the project success rate can be confirmed due to the evidence presented earlier by other authors. For instance, according to the study conducted by (Zwikael & Globerson, 2006), those projects which have defined aims, proper timetables and well-organized quality planning procedures have higher chances to meet deadlines and to achieve other objectives stated at the beginning. Additionally, the positive correlation between quality planning and project success proved in this paper is consistent with the findings of (Globerson & Zwikael, 2004) related to the PMPQ model. Furthermore, the obtained result also supports the claims made by (Bhonde & Shaikh, 2015) concerning the importance of developing quality aims and plans to promote better project results. In addition to the mentioned facts, it should be noted that the findings of the study carried out by (Duicu et al., 2013) and (Githenya & Ngugi, 2014) also confirm

the validity of the obtained result in regard to the role of quality management planning for the success of real estate projects.

The effect of quality assurance on project success

The quality assurance (B = .453, p =.000) has a significant and positive influence on project success (there is no p-value greater than 0.05). In other words, the greater quality assurance in real estate projects, the greater project success. Therefore, attempts to achieve quality assurance will be fruitful for organizational project success.

The empirical result indicates that Quality Assurance positively affects the success of projects at a statistically significant level. This is a validation of the importance of Quality Assurance in ensuring project success, as earlier confirmed by previous literature. For example, the use of Quality Assurance principles in construction projects led to greater customer satisfaction and better performance of the projects as reported by (Arditi & Gunaydin, 2007). Moreover, the positive relationship obtained in the present study is consistent with the findings of (Mallawaaracchi & Senaratne, 2015), which indicated that quality assurance helps reduce errors and ensure timely delivery and budgeting of projects.

The present result is also in agreement with the propositions put forward by (Alshamamri, 2013), who argued that integrating Quality Assurance into project management increases the likelihood of project success since it ensures successful completion of the projects. The empirical results also confirm the findings of (Love et al., 2000), which argued that quality management is critical in reducing reworks, cost, and delays. Thus, the empirical result proves the existence of Quality Assurance and its role in project success in practice. In other words, it indicates that Quality Assurance contributes to the success of real estate projects in the Addis Ababa region of Ethiopia. Consequently, the hypothesis, which suggests that Quality Assurance has a statistically significant effect on the success of real estate projects, is accepted.

The effect of quality control on project success

The quality control (B = .263, p =.000) has a significant and positive influence on project success. In other words, the greater quality control in real estate projects, the greater project success. Therefore, attempts to achieve quality control will be fruitful for organizational project success.

The empirical finding shows that there is a statistically significant positive impact of Quality Control on project success. This indicates the importance of quality control in enhancing project performance, as has been proven in previous research works. The study conducted by (Githenya & Ngugi, 2014), for instance, found that there was a very strong relationship between quality control and construction project execution. Likewise, the positive relationship identified in this research work is consistent with the findings of (Wambugu, 2013) showing that the control of variables such as provision of quality materials is important in determining the success and productivity of real estate projects.

Additionally, the result is consistent with the claims made by (Reyes, 2012) indicating that undertaking quality control inspection and identifying the non-conformity levels will facilitate efficient project execution. Furthermore, the empirical findings agree with the findings of the study carried out by (Arachchi et al., 2015) highlighting that quality control plays an important role in the detection of weaknesses that may affect the whole project success. Therefore, based on empirical evidence, it has been proved that quality control is not only an academic concept, but it plays an important role in ensuring project success in the real estate industry of Addis Ababa, Ethiopia. In light of this, the hypothesis that quality control has a positive and significant effect on project success is accepted.

Finally, when comparing the relative influence of the three independent variables on the dependent variable. the standardize coefficient (Beta value) show that quality assurance (β = .432) has stronger effect on project success followed by quality control (β = .285) while quality planning (β = .284) the least influence on the dependent variable.

Regression Model:

Based on the regression analysis the revised regression model equation has been adjusted as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$$

Where:

- Y = is the measured value of project success or the value of the dependent variable

- Independent variables

  x_1 = The measured value of Quality Planning

  x_2 = The measured value of Quality Assurance

  x_3 = The measured value of Quality Control

- βo= Constant term (coefficient of intercept)
- $\beta_1, \beta_2, \beta_3$ = Coefficients of the independent variables (regression coefficient).
- ε = Error term

$$Y = 0.034 + 0.271x_1 + 0.453x_2 + 0.263x_3 + \varepsilon$$

4.6.2 Summary of Hypothesis

Table 4.16 Summary of Hypothesis

Hypothesis	Result	Decision
H1: The effect of quality planning on project success is statistically significant and positive.	Significant(B=.271), positive (p = .000)	Hypothesis Accepted
H2: The effect of quality assurance on project success is statistically significant and positive.	Significant(B=.453), positive (p= .000)	Hypothesis Accepted
H3: The effect of quality control on project success is statistically significant and positive.	Significant(B=.263), positive (p = .000)	Hypothesis Accepted

Source: Survey Data, 2026

CHAPTER 5

SUMMARY, CONCLUSTION AND RECOMMENDATION

5.1. Introduction

The current chapter gives an outline of the main findings of the study, the conclusion made by the researcher and the recommendations made after analyzing the results. Future suggestions for further studies are also made. The current chapter is prepared based on the analysis of the effects of quality management which includes quality planning, quality assurance, and quality control on the success of projects in the real estate sector in Addis Ababa.

5.2. Summary of findings

The current study aimed at establishing the influence of quality management dimensions on the success of projects. This included analyzing the three quality management dimensions of quality planning, quality assurance, and quality control. Analysis of the raw data was done using Statistics Package for Social Science Version 27. Figures and tables were used in illustrating the results generated from the analysis. Below are the key findings of the current study.

- The findings show that quality planning, quality assurance, and quality control have been implemented in some context in the chosen real estate projects. however, variation remain in ensuring that the quality standards have been upheld all through the process.
- According to the findings, most participants rate the success of their projects as being moderate since even though the projects have been successful in aspects like cost, time, and quality, they can still improve.
- Quality planning, quality assurance, and quality control have shown a statistically significant positive influence on the success of projects, implying that quality management play an important role in ensuring project success.
- The study indicated that quality assurance had the strongest influence of the three quality dimensions on the success of projects.
- Moreover, it has emerged that the percentage of variation in the success of the projects explained by quality management was high.

- In summary, all the formulated hypotheses were proven; hence quality management dimensions contribute to project success.

5.3. Conclusion

It was concluded that the proper implementation of quality management contributes to the successful completion of real estate projects. Companies implementing quality planning and quality assurance as well as conducting quality control activities manage to deliver projects effectively and efficiently by making sure, they meet all requirements within the shortest possible period of time.

- The results reveal that the selected real estate projects apply quality planning, quality assurance, and quality control at a moderate level, meaning that although the quality management system exists, it is not yet applied extensively enough. Likewise, project success in the selected projects is moderate indicating that while projects demonstrate certain levels of success regarding time, cost, quality, and client satisfaction, considerable improvements are possible.
- The inferential analysis revealed that quality planning is a key element which positively impacts project success by assisting projects in setting quality goals, determining quality standards and implementing quality activities. In other words, improved planning of quality activities enhances the possibility of achieving a project success.
- Moreover, the research concludes that among all three dimensions of quality management, quality assurance has the most significant impact on project success. This means that process monitoring, compliance with standards, staff qualification, training, and continuous improvement are important factors in increasing project success.
- Furthermore, the study reveals that quality control is an important factor that positively influences project success by providing assistance in inspection, testing, defect detection and rectifying defects. This means that projects applying quality control mechanisms will be able to provide better technical quality, minimize rework and increase project success.
- Thus, the study concludes that the application of quality management is crucial in enhancing project success of real estate projects in Addis Ababa. Hence, real estate companies which apply quality planning, quality assurance, and quality control can successfully deliver projects regarding quality, time, cost, and client satisfaction.

Theoretical implications

- Consequently, the obtained findings support the main quality management theories such as Juran's Quality Trilogy and the principles of total quality management. In particular, the research focuses on quality planning, assurance, and control.
- The contribution of the research to the existing literature on the topic concerns gaining the empirical evidence about the effect of the quality management practices on the performance of projects carried out in the developing country.

Practical implications

- Hence, it may be concluded that the practices of quality assurance should receive additional attention of real estate organizations to help deliver high-quality projects and follow the required quality standards.
- The real estate organizations need to focus on developing quality management systems that would allow to implement the practices of quality planning, assurance and control.

5.4. Recommendation

- Real estate companies need to focus on enhancing the implementation of quality management practices through the whole project life cycle. In view of the fact that quality planning, quality assurance, and quality control have proved to have a considerable positive impact on the success of a project.
- Project managers and project teams need to pay more attention to quality planning at the very beginning of each project. It is meant to include the preparation of quality plans, establishment of quality objectives, quality standards, assignment of responsibilities, and definition of quality monitoring procedures. Thus, the enhancement of quality planning is expected to result in fewer defects, no rework, and increased likelihood of achieving project objectives.
- Real estate companies should pay more attention to quality assurance because its role has been shown to be the greatest for the success of projects. The improvement of process monitoring, the observance of established standards and procedures, regular review of the quality of work performed, and promotion of continuous improvement are some ways of enhancing quality assurance. Real estate companies should also pay much attention to

providing the training of their employees and assuring that the professionals involved in project implementation have sufficient competence.

- companies should enhance quality control during project implementation by means of inspecting, testing the material and work output used, finding defects in advance and correcting them.
- Real estate companies should promote a culture of continuous improvement by means of documentation of lessons learned from ongoing and completed projects and using them as the basis for future projects.
- regulatory bodies and sector stakeholders need to enhance the follow-up and support mechanism to promote the use of quality management practices in real estate projects.

5.5. Suggestion for future research

- Another aspect that could help increase the scope of future research in this domain is including other domains of the construction industry and then researching on them.
- A consequence of this study taking the quantitative approach could be the use of a qualitative approach in future studies in this field involving interviews and case studies.
- The comparison of quality management in construction for private and public projects is one area that should be explored in the future.
- An aspect of quality management in construction projects like innovations and technology is another area that should be researched in detail.

Reference

Ali, A.S. and Rahmel, B. (2010) 'The performance measurement of construction project managed by ISO-certified contractors in Malaysia', *Journal of Retail & Leisure Property*, 9(1), pp. 25–35. https://link.springer.com/content/pdf/10.1057/rlp.2009.20.pdf

Almusharraf, A. (2015) 'Quality management in construction projects', *International Journal of Engineering Research and Applications*, 5(5), pp. 12–18.

Alshamamri, R. (2013) 'Implementing quality assurance in project management: Establishing organizational structures', *International Journal of Project Management Studies*, 5(1), pp. 22–30. https://www.ajol.info/index.php/aujst/article/download/290372/273193

Arditi, D. and Günaydın, H.M. (2007) 'Total quality management in the construction process', *International Journal of Project Management*, 15(4), pp. 235–243. A

Arachchi, K., Chong, C.S. and Madhushani, S. (2015) 'The role of quality control in ERP implementation success', *International Journal of Information Management*, 35(4), pp. 450–460.

Atamba, L. and Kwasira, T. (2023) 'Quality management practices and successful completion of building construction projects in Nakuru Town, Kenya', *International Journal of Business Management and Technology*, 7(6).

Awoke, W. (2022) *Assessment of quality management system in real estate construction in Addis Ababa: The case of Gift Real Estate*. Thesis. St. Mary's University.

Baccarini, D. (1999) 'The logical framework method for defining project success', *Project Management Journal*, 30(4), pp. 25–32.

Belout, A. (1998) 'Effects of human resource management on project effectiveness and success: Toward a new conceptual framework', *International Journal of Project Management*, 16(1), pp. 21–26.

Bhonde, U. and Shaikh, S. (2015) 'Quality management in construction projects: Planning, monitoring, and evaluation', *International Journal of Engineering Research & Technology*, 4(6), pp. 123–129.

Chan, A.P.C. and Chan, A.P.L. (2001) 'Key performance indicators for measuring construction success', *Benchmarking: An International Journal*, 8(3), pp. 203–221.

Chovichien, V. and Nguyen, T.A. (2013) 'List of indicators and criteria for evaluating construction project success', *Construction Management and Economics*, 31(9), pp. 918–932.

Cooke-Davies, T. (2002) 'The "real" success factors on projects', *International Journal of Project Management*, 20(3), pp. 185–190.

De Wit, A. (1988) 'Measurement of project success', *International Journal of Project Management*, 6(3), pp. 164–170.

Duicu, C., Ciobanu, R. and Popescu, D. (2013) 'The role of quality planning in project management success', *Procedia Technology*, 12, pp. 562–569.

Frödell, M., Josephson, P.-E. and Lindahl, G. (2008) 'Swedish construction clients' views on project success and measuring performance', *Construction Management and Economics*, 26(4), pp. 393–401.

Gazal, H.O., Musibau, A. and Rukayat, O. (2022) 'Evaluation of impact of project quality management on project success', *International Journal of Interdisciplinary Research in Social Sciences*. Available at: https://www.kcaijirss.com/index.php/home

Jha, K.N. and Iyer, K.C. (2006) 'Critical factors affecting quality performance in construction projects', *Total Quality Management & Business Excellence*, 17(9), pp. 1155–1170. Available at: https://www.tandfonline.com/doi/abs/10.1080/14783360600750444

Jima, S.B. (2018) *Challenges and sustainability of private residential real estate construction projects*.https://scholar.archive.org/work/umpntodn4jcfninibz5ikovjli/access/wayback/https://nadre.ethernet.edu.et/record/3613/files/THESESAASTU-2019-291.pdf

Kumaraswamy, M.M. and Dissanayaka, S.M. (2000) 'ISO 9000 and beyond: From a Hong Kong construction perspective', *International Journal of Quality & Reliability Management*, 17(2), pp. 136–149.

Leong, T., Zakuan, N., Saman, M., Ariff, M. and Tan, C. (2014) 'Using project performance to measure effectiveness of quality management system maintenance and practices in construction industry', *The Scientific World Journal*, 1(1), pp. 1–9.

Low, S.P. and Jasmine, A.T. (2004) 'Implementation of total quality management in construction firms', *International Journal of Project Management*, 22(5), pp. 409–424.

Love, P.E.D., Li, H. and Mandal, P. (2000) 'Determining the causal structure of rework in construction', *Construction Management and Economics*, 18(4), pp. 479–490.

Mallawaaracchi, T. and Senaratne, S. (2015) 'Quality management practices in construction projects: Impacts on project performance', *International Journal of Construction Management*, 15(3), pp. 199–210.

Markos, F. (2018) *Assessment on the implementation of quality management practices in real estate construction in Addis Ababa: The case of Flintstone and Afro Tsion Real Estate*. Thesis. Addis Ababa University.

Mathews, B., Ueno, T., Kekale, T., Repka, S., Pereira, L. and Silva, P. (2001) 'Quality tools and techniques for construction projects', *International Journal of Quality & Reliability Management*, 18(6), pp. 619–635.

Mane, P.P. and Patil, J.R. (2015) 'Quality management system at construction project: A questionnaire survey', *International Journal of Engineering Research and Applications*, 5(3), pp. 126–130.

Neyestani, B. and Juanzon, J.B.P. (2016) 'Developing an appropriate performance measurement framework for total quality management in construction and other industries', *IRA International Journal of Technology & Engineering*, 5(2), pp. 32–44.

Nofal, M., Al-Hajj, A. and Hamzeh, F. (2014) 'Quality improvement practices in construction projects', *Journal of Construction Engineering and Management*, 140(6), pp. 1–10.

Olatunji, O.A., Windapo, A.O. and Nureni, A.A. (2012) 'Total quality management implementation in the construction industry', *Journal of Construction Project Management and Innovation*, 2(1), pp. 1–16.

Project Management Institute (PMI) (2021) *A guide to the project management body of knowledge (PMBOK® guide)*. 7th edn. Newtown Square, PA: Project Management Institute.

Quiambao, F. and Alvaro, J. (2023) 'Quality management practices in select real estate construction firms: The role of team involvement in decision making', *e-Journal of Philippine Studies*, 15(2), pp. 45–59.

Ruxwana, N.L., Herselman, M.E. and Conradie, P. (2014) 'An investigation into quality assurance challenges in project management', *South African Journal of Industrial Engineering*, 25(2), pp. 101–112.

Sözen, E. and Güven, U. (2019) 'The effect of online assessments on students' attitudes towards undergraduate-level geography courses', *International Education Studies*, 12(10), p. 1.

Tavakol, M. and Dennick, R. (2011) 'Making sense of Cronbach's alpha', *International Journal of Medical Education*, 2, pp. 53–55.

Turner, J.R. (2016) *Gower handbook of project management*. 5th edn. London: Routledge. https://books.google.com/books?hl=en&lr=&id=8oEHDAAAQBAJ&oi=fnd&pg=PP1

Wai, S.H., Yusof, A.M., Ismail, S. and Ng, C.A. (2012) 'Exploring success factors of construction projects in Malaysia', *International Journal of Engineering Business Management*, 4(1), pp. 1–9. https://journals.sagepub.com/doi/pdf/10.5772/55659

Wawak, S., Ljevo, Ž. and Vukomanović, M. (2020) 'Understanding the key quality factors in construction projects—A systematic literature review', *Sustainability*, 12(24), p. 10376.

Yohannes and Dinku (2024) *The performance of private residential real estate developers in Ethiopia: The case of Addis Ababa*. Addis Ababa: Addis Ababa University.

Zwikael, O. and Globerson, S. (2004) 'Evaluating the quality of project planning: A model and field results', *International Journal of Production Research*, 42(8), pp. 1545–1556.

APPENDIX

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

M.A Research on Project Management

Dear Respondent,

I would like to express my sincere gratitude for your willingness to serve as a respondent for this survey. This questionnaire has been developed as part of the data collection tool for the partial fulfillment of the requirements for the Master of Project Management degree. **The title is "**The Effect of Quality Management on Project Success: Evidence from real estate Projects in Addis Ababa" I assure you that all information gathered through this questionnaire will be used solely for legitimate academic purposes. The anonymity of each respondent will be strictly maintained throughout the research process. Based on your professional experience, kindly indicate the extent to which quality management practices particularly those emphasizing the technical and process-related aspects of construction projects are reflected in your context. Please mark your response by ticking (√) the appropriate box using the following scale: where 1= **Strongly Disagree, 2 = Disagree**, **3 = Neutral, 4 = Agree,** 5 = **Strongly Agree**

Your honest and thoughtful responses are highly valued and will contribute significantly to the quality of this research.

Thank you once again for your cooperation and support.

Name: Yordanos Abebayehu

Email: - abebayehuyordanoss@gmail.com

SECTION A: GENERAL INFORMATION

1. Gender

Male ☐ Female ☐

2. Age

21-29 ☐ 30-40 ☐ 41-50 ☐ >50 ☐

3. Educational background

Graduate (MSC) ☐ Diploma ☐

Undergraduate (BSC) ☐

If other, please specify ----------

4.What's the title of your position?

Project Manager ☐ Site Engineer ☐ Foreman ☐

Consultant ☐ Office Engineer ☐

If other, please specify ----------

5. In which real estate project, you are involved?

please specify ----------

6. How long have you been working in your company?

0-5 years ☐ 10-15 years ☐

6-10 years ☐ more than 15 years ☐

SECTION B: COMPONENTS OF QUALITY MANAGEMENT

The following statements are issues related to the implementation of selected independent variables on quality management. Please Mark the Appropriate Answer by (√), Using the key (Where: 1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree)

No	Item	1	2	3	4	5
P1	Quality Planning					
1.1	The Project has well written and documented quality plans					

1.2	Quality plan defines the specific quality goals and objectives for the project					
1.3	The quality plan clearly stipulates the actions the project team intends to take to achieve quality goals					
1.4	Quality plans stipulate ways for evaluating the implementation of the plan					
1.5	Senior managers are actively involved in the developments of quality plans					
1.6	Line employees and clients are engaged in the development of quality plans					
P2	Quality Assurance	1	2	3	4	5
2.1	The project has a quality assurance plan to monitor and control project quality					
2.2	The company has structured system for recruiting construction workers					
2.3	The company has elaborate programs for improving workers capacity and engagement levels					
2.4	The company has a well-structured system for vetting and selecting suppliers					
2.5	The company has comprehensive programs for improving suppliers' capacity and engagement level					
2.6	The project has effective system for evaluating design and engineering drawings					
P3	Quality Control	1	2	3	4	5
3.1	The project has independent quality control and					

	inspection (QCI) teams to monitor quality standards					
3.2	The project has an inspection schedule created to monitor quality throughout its execution					
3.3	The project allocates adequate resources to its quality control and inspection (QCI) teams					
3.4	The project applies statistical methods to identify and monitor quality variations					
3.5	The project takes corrective measure whenever quality gaps are identified during inspections					
3.6	Senior managers are actively involved in project quality control activities					

SECTION C: SELECTED VARIABLES OF PROJECT SUCCESS

The following statements are issues related to the implementation of selected dependent variables on project success. Please Mark the Appropriate Answer by (√), Using the key (Where: 1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree)

No	Item	1	2	3	4	5
P4	Project Success					
4.1	The project is completed within the scheduled timeline					
4.2	The project is completed within the authorized budget and financial constraints					
4.3	Clients are satisfied with the outcome of the project					

4.4	Projects meets with all technical quality standards and specification					
4.5	Lessons learned from previous projects are applied to the success of subsequent projects					

Part two: Open ended question

1) please share any additional thoughts or experience related to quality management in real estate projects?

_____

2) In your opinion, what challenges affect the implementation of quality planning, quality assurance and quality control in construction projects?

_____