



**College of Business and Economics**

**School of Commerce**

**Title: The Effect of Quality Management System on Project Success:  
In the case of Hosea Real Estate**

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## **Statement of Declaration**

I, Loza Merid, declare that the thesis entitled “The Effect of Quality Management System on Project Success: In the Case of Hosea Real Estate” is my original work. I did this study independently with the advice and help of my research adviser Fesseha Afework (Asst. Prof.). Furthermore, this research has not been submitted to any other program or university and all information sources used have been properly acknowledged.

**Declared by: Loza Merid**

Signature \_\_\_\_\_ Date \_\_\_\_\_

This letter certifies that Loza Merid Asfaw completed her research on “The Effect of Quality Management System on Project Success: In the Case of Hosea Real Estate”. The work is unique and qualifies for the Master of Arts in Project Management award.

**Advisor: Fesseha Afework (Asst. Prof.)**

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**THE EFFECT OF QUALITY MANAGEMENT SYSTEM ON PROJECT  
SUCCESS: IN THE CASE OF HOSEA REAL ESTATE**

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## List of Abbreviations and Acronyms

ISO	International Organization for Standardization
PM	Project management
EQA	Ethiopian Quality Award
QA	Quality Assurance
QC	Quality Control
QMS	Quality Management System
QS	Quality System
CQMS	Construction Quality Management System
TQM	Total Quality Management

## **Abstract**

*This research study aimed to investigate the effect of QMS on project success, using the case of Hosea Real Estate, a construction firm in Addis Ababa. The study employed a mixed-methods approach, utilizing both quantitative and qualitative data collection techniques. A structured questionnaire was distributed to 40 project experts within the organization, achieving a 100% response rate. Additionally, interviews were conducted to gain deeper insights into the management's role and the implementation of quality management practices. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 28, focusing on descriptive statistical analysis along with inferential analysis.*

*The findings revealed that Hosea Real Estate's quality planning, quality assurance, and quality control mechanisms had a significant positive effect on project success. Specifically, the study found that implementing clear quality objectives and control procedures positively impacted project outcomes. Additionally, an effective quality assurance system, including regular quality audits and process monitoring, enhanced project success. Furthermore, the study identified that the company's overall quality management system mediated the relationship between quality management practices and project success. Factors such as top management commitment, employee involvement, and continuous improvement were found to moderate this relationship.*

*The research provides valuable insights for construction companies in Ethiopia, highlighting the importance of establishing a robust quality management system to ensure the successful delivery of construction projects. The findings offer practical recommendations for strengthening quality management practices and achieving better project outcomes. These recommendations include enhancing quality planning processes, strengthening quality assurance mechanisms, and implementing more comprehensive quality control measures. The study also underscores the need for increased investment in employee training and development programs to further improve quality management practices within the construction industry in Ethiopia*

**Key words:** Quality Assurance, Quality planning &Control, Quality Management System, Project management, Quality

# **Chapter One: Introduction**

## **1.1 Background**

The construction industry plays a vital role in global economic growth and development, contributing to employment, infrastructure development, and overall prosperity. However, it faces persistent challenges in achieving consistently high-quality projects. While technological advancements and management practices have been made, issues such as project delays, cost overruns, safety hazards, and dissatisfaction with the final product remain common worldwide. Quality Management System (QMS) is a set of procedures and policies that organizations use to ensure the consistent quality of their products or services. One of the most widely adopted QMS frameworks is the ISO 9000 standard, which has been implemented by over 776,608 companies across 161 countries since its introduction.

Existing evidence suggests that the adoption of ISO 9000 QMS can bring several benefits to organizations, including improved communication between stakeholders, reduced mistakes and rework, better control over subcontractors and suppliers, and ultimately, increased productivity, profitability, and market share. Additionally, the implementation of QMS helps organizations meet client requirements more effectively.

In the construction industry, the traditional approach to quality management has been focused on inspection and quality control, where construction works and materials were accepted or rejected based on these processes. However, the introduction of the BS 5750: Quality Systems in the UK in the 1980s and the subsequent development of the ISO 9000 standards have significantly changed the industry's perception and approach to managing quality in construction projects.

The local construction industry in the study context has also been affected by the widespread adoption and importance of ISO 9000 certification, which has become a significant phenomenon in the industry. This emphasizes the need for construction companies, such as Hosea Real Estate Construction, to implement a robust QMS to address the challenges they face and improve the quality of their projects.

The development of the real estate industry is crucial for a country's overall progress, contributing significantly to employment, the growth of commercial banking, and the development of capital markets. Moreover, it enhances the well-being of households by

providing quality shelter and facilitating the accumulation of personal wealth that can be leveraged for further prosperity (Taylor, 2004)

Quality is a fundamental concept in the success of real estate projects, where project success and quality are defined by meeting the expectations and satisfaction of all project participants, including clients, construction consultants, and contractors. In Ethiopia, the construction industry has faced challenges with quality issues over the years, leading to significant budget allocations for infrastructure projects. Subpar quality outcomes often result in faulty constructions, necessitating additional investments for defect removal and maintenance work. In real estate development firms, quality management should encompass both agent services and construction activities. Implementing Quality Management Systems (QMS) in service industries like real estate poses unique challenges due to the intangible nature and immediate consumption of services. (Heskett, Sasser and Hart, 1990; Heskett, Sasser and Schlesinger, 1997; and Fitzsimmons and Fitzsimmons, 1998). The focus in service industries typically centers on organizational processes that deliver services rather than tangible products.

The application of QMS in construction projects is essential for ensuring compliance with quality standards, timely completion within budget constraints, and customer satisfaction. Quality management systems encompass quality planning, assurance, control, and continuous improvement to achieve optimal project outcomes

### **1.1.1 Overview of Hosea Real Estate**

Addis Ababa, the capital and largest city of Ethiopia, is a booming metropolis with a high demand for housing and urban development. As the city grows, so does the number of real estate projects and developers that are focusing on apartments for different segments of the market, from luxury to affordable. Most real estate developers in Ethiopia are small-scale mom-and-pop shops, however, there are some that stand out for having done multiple projects and having been in the sector for many years and Hosea is one of the 169 developers in Addis Ababa from among those have implemented QMS .

Hosea Real Estate Development, under the leadership of its founder and CEO, Ato Yeman G/selasea, was established in 2008. Over the years, the company has diversified its investments across various industries, including real estate development, spice and edible oil exports, medicinal drug imports, and construction-grade steel product imports. Notably, since 2018,

Hosea has actively engaged as a real estate developer, undertaking significant projects in Addis Ababa.

The company has successfully completed three rounds of real estate development on approximately 5,500 square meters of land across three sites: 22, Hayate, and Bole. In the first phase, houses were constructed on a 1,000-square-meter plot and transferred to homeowners within a remarkable timeframe of one year and eight months. The second phase, covering 3,000 square meters, witnessed the completion of infrastructure facilities such as roads, as well as the provision of utilities including power, water, communication lines, and waste management systems. This phase addressed the housing needs of 300 residents by offering affordable yet high-quality housing options with various typologies. The inauguration of this phase was honored by the presence of the Mayor of Addis Ababa, Adanech Abebe.

Currently, Hosea is in its third phase, focusing on constructing high-rise apartments on a 1,500-square-meter plot in the central business district (CBD). Approximately 30% of the construction stages have been completed, indicating the company's commitment to expanding its real estate offerings.

Through its consistent growth and strategic approach, Hosea Real Estate has emerged as a prominent player in the industry, managing a diverse portfolio of properties and investments valued at over 250 million Ethiopian Birr. The company aims to maintain a balanced investment portfolio, encompassing residential houses, commercial buildings, and other real estate options.

As Hosea enters a new phase of transformation, it recognizes the need to consolidate its successes and address any existing weaknesses. Internal reports, reviewed by consultants, highlight the company's commitment to improvement and enhancement. This phase of transformation underscores Hosea's determination to build upon its achievements, refine its operations, and position itself as a leading real estate company in the region.

The company's dedication to delivering quality products, addressing housing needs, and contributing to the development of Addis Ababa's real estate sector underscores its significance and potential for further growth and success.

## **1.2 Problem Statement**

The construction industry, particularly in the context of real estate development, faces numerous challenges in maintaining and improving quality standards. Inadequate quality management practices in the real estate housing construction industry in Addis Ababa have led to widespread criticism due to the perceived low quality of construction projects, both in terms of the finished product and the construction processes employed. This has resulted in low achievement rates, negative impacts on completion time, cost overruns, and quality-related issues, contributing to overall poor project performance. A recent industry report showed that over 60% of real estate construction projects in Addis Ababa experienced significant quality-related issues, leading to client dissatisfaction and project delays.

The current state of the industry is characterized by a lack of care and poor attitude towards quality among contractors, as well as generally low-quality management practices in Ethiopia, including leadership, policy and strategy, resources management, process management, customer satisfaction, business performance, and impact on society. The absence or inefficiency of quality management procedures in construction projects leads to significant wastage of time, money, and resources, as well as non-compliance with established requirements. These quality-related problems during construction can have long-term consequences for the operating life of the finished project, resulting in penalties, time burdens, and productivity losses.

Hosea Real Estate Construction, a leading real estate developer in Addis Ababa, has recognized the importance of implementing a robust Quality Management System (QMS) to address these challenges and improve the quality of its construction projects. A well-implemented QMS can help Hosea Real Estate Construction eliminate ambiguity in project activities, enhance overall construction quality, and improve customer satisfaction, which is crucial for maintaining its reputation and competitiveness in the market. Additionally, a QMS can help the company better manage project timelines, budgets, and resources, leading to more successful project outcomes.

By conducting this research, the study will contribute to bridging the gap between the current state of quality management practices and the desired state of a well-implemented QMS. The study will provide valuable insights and guidance on successfully implementing QMS, which can be used by Hosea Real Estate Construction and other real estate developers in the industry

to address the challenges they face and improve the quality of their construction projects. The research will be backed up by verifiable evidence, such as data collected through interviews, surveys, and document analysis, as well as a comprehensive review of relevant literature on quality management in the construction industry.

### **1.3 Research Objectives:**

#### **1.3.1 General Objective**

Assessing the effect of construction quality management on real estate development, with a specific focus on Hosea Real Estate. It aims to evaluate the effectiveness of their quality management practices and QMS influence on project success.

#### **1.3.2 Specific Objective**

The specific objectives align with the general research objective and aim to address various aspects related to the effect of the Quality Management System on project success in the specific case of Hosea Real Estate Construction.

1. To identify and analyze the specific quality management practices employed by Hosea Real Estate Construction, as well as the main challenges faced in implementing these practices.
2. To examine the influence of the quality management system on the project success, reputation, and customer satisfaction for Hosea Real Estate Construction.
3. To evaluate the impact of the quality management system on the completion time, adherence to project budgets, and overall cost implications for the construction projects undertaken by Hosea Real Estate Construction.

### **1.4 Research Questions:**

1. What are the specific quality management practices employed by Hosea Real Estate Construction, and what are the main challenges faced in implementing these practices?
2. How does the implementation of a quality management system influence the project success, reputation, and customer satisfaction for Hosea Real Estate Construction?
3. What is the impact of the quality management system on the completion time, adherence to project budgets, and overall cost implications for the construction projects undertaken by Hosea Real Estate Construction?

By addressing these research questions, this study aims to provide valuable insights into the effect of construction quality management in the context of real estate development, offering recommendations to enhance quality practices and promote successful project outcomes.

### **1.5 Significance of the Research:**

The research on the effect of quality management in real estate development project success holds significant importance due to the following reasons:

1. **Practical Contribution to Hosea Real Estate Construction:** The study's findings will provide valuable insights for Hosea Real Estate Construction in understanding the impact of quality management systems on project success. The company can use this knowledge to enhance its quality management practices, address challenges, and improve overall project outcomes. It will contribute to their ability to deliver successful construction projects, enhance client satisfaction, and strengthen their reputation in the industry.
2. **Customer and stakeholder Satisfaction:** Ensuring high-quality construction can enhance customer satisfaction, foster positive relationships, and facilitate repeat business.
3. **Cost Reduction:** Implementing robust quality management systems can minimize the costs associated with rework, warranty claims, and legal disputes.
4. **Industry Reputation:** High-quality construction practices contribute to overall Hosea's reputation in the real estate development industry, attracting investors and stakeholders.
5. **Contribution to the Construction Industry:** The research will contribute to the broader construction industry by highlighting the importance of quality management systems in achieving project success.

### **1.6 Scope of the study**

This study is limited to quality management practices in Hose Real Estate Company projects and the effect of implementing Quality management in the company.

## **1.7 The Organization of the Report**

This research proposal has three chapters containing an introductory part with a background of the study, a statement of the problem, the significance of the study, research questions, and the scope of the study included in chapter one. Chapter two is composed of a review of the relevant literature which includes theoretical, conceptual, and empirical frameworks. Chapter three contains the details of the research methodology and the steps that will be used to gather and analyze data.

## **Chapter Two: Literature Review**

### **2.1 Introduction**

This chapter provides a comprehensive overview of the construction industry and the role of real estate firms within it. It presents a synthesis of diverse findings and conclusions from various articles, ensuring that recent publications are given particular consideration to align with the main theme of this paper. This will make it possible to evaluate the construction quality management practices on the chosen Organization using the best technique and approach. Additionally, this chapter includes a concise summary of the conceptual framework that underpins the study.

The construction industry in Ethiopia is expected to grow by 5.6% in real terms in 2023, and register an average annual growth of 8.9% from 2024 to 2027. The literature review reveals that the construction industry holds significant importance within the economy and plays a crucial role in socio-political and economic development. To achieve desirable outcomes with high quality, it is imperative to have a deep understanding of the construction industry and its effective functioning. Lund (2011) highlights that each construction project within the industry is characterized by its unique nature, as they involve individual orders and production processes.

Over the past two decades, the concepts of "quality" and "quality management systems" have gained substantial prominence in the business world. These terms have become widely recognized, leading to the emergence of numerous consultants who specialize in these areas. Quality-related concerns have not only shaped the growth of new organizations but have also given rise to entire industries, such as the American Society for Quality and Six Sigma consulting.

The notion of quality in business focuses on the savings and additional revenue that organizations can realize if they eliminate errors throughout their operations and produce products and services at the optimal level of quality desired by their customers.

A construction project is considered successful when it is completed on time, within budget, following specifications, and to stakeholders' satisfaction. However, levels of project performance and project success are low in the construction industry especially in developing countries such as Nigeria where owners are generally dissatisfied (Odediran, Babalola & Adebisi, 2013; Isa, Jimoh & Achuen, 2013). One of the significant reasons for owners' dissatisfaction with building projects is their poor quality (Abdulrahman, Wang & Wen, 2010; Achi, Onukwube & Ajayi, 2007). Every customer wants a quality product that meets its needs and is worth the value of money it has invested into the product (Achi et al., 2007). The construction industry has many characteristics that set it apart from other production environments, especially when compared with other sectors such as manufacturing (Kamal, Yusof & Iranmanesh, 2016).

## **2.2. Theoretical Literature Review**

### **2.2.1 Project and Project Management**

**Project:** Several definitions have been provided by many scholars on the matter. Projects are short-term activities that aim to provide a unique product, service, or outcome (PMBOOK, 2013). One of the most important qualities of a project is that it has a clear goal, a defined beginning and finish, and that it involves multiple departments and specialists. It also does something new that has never been done before, and it has certain time, cost, and performance criteria (Larson, 2011).

**Project Management:** According to Kerzner (2009), project management entails using a variety of information, tools, and abilities to get best outcomes. It is the process of planning, organizing, directing, and regulating resources for a relatively short-term aim or target. Information/communications, contract/procurement, human resources, and risk management are all integrated into project management. Moreover, one of the most commonly accepted definition of project is that a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification (Robert K. Wysocki, 2014).

### **2.2.2 Quality Management**

**Quality:** may mean features of products that meet customer needs and thereby provide 0911 customer satisfaction, yet others equate it to attainment of prescribed standards. The International Organization for Standardization (ISO) formally defines quality as the ‘totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs’ (ISO, 1994). According to Burati, Matthews, and Kalindi (1992), quality is defined as meeting specific performance requirements, which encompass legal, aesthetic, and functional aspects (Arditi & Gunaydin, 1997). However, a more widely accepted definition of quality is provided by the International Standard Organization (ISO8042, 1994). The ISO defines quality as the combination of features and characteristics of a product or service that contribute to its ability to satisfy stated or implied needs. Renowned quality management expert, Dr. J.M. Juran, simplifies quality as "fitness for purpose." In essence, a product that fulfills its intended purpose effectively meets the user's needs and expectations. The key lies in ensuring clarity of purpose among all parties involved in the design and production process (Chung H.W., 1999). These definitions of quality are consistent with the teachings of previous quality management experts. Their views on quality serve as the foundation for understanding its significance.

Assessing the quality of construction work presents challenges as many construction practices cannot be easily quantified. Barbara J. Jackson (2010) states that the quality of a project is defined by the standards outlined in the specifications. Quality directly impacts project costs, as specifications dictate the materials and equipment to be used. Each construction product has varying levels of performance, durability, and aesthetics. Therefore, a project that specifies minimum standards for materials and installations will generally incur lower costs compared to one incorporating high-end materials and installations.

### **2.2.3 Quality Management System**

According to ISO 8402 (1994), a quality management system encompasses all management functions that establish quality policy, objectives, and responsibilities, and implement them through activities like quality planning, quality control, quality assurance, and quality improvement within a quality system. In the context of construction projects, there are three main processes involved in quality management: quality planning, quality assurance, and quality control (Nicholas & Steyn, 2008; PMI, 1996).

Quality management aims to enhance organizational performance and meet the needs of stakeholders by improving products, services, systems, and processes. It involves ensuring that the entire organization is effective and capable. Managing quality requires a continuous pursuit of excellence, ensuring that organizational activities are fit for purpose and continually improving (Hakim et al., 2006).

To achieve continuous improvement in a quality management system, it is crucial for top management to provide full support and commitment, particularly in the development and implementation of construction projects. This entails clearly identifying, documenting, planning, implementing, and controlling quality management in an efficient manner (Griffith & Watson, 2004). A Project Quality Plan (PQP) is typically prepared to establish project-level quality procedures that align project information with company policies, procedures, and inspection routines.

ISO 9001:2015 is a widely recognized standard that sets requirements for a quality management system, applicable to organizations of any size or sector. Although certification is not mandatory, ISO 9001:2015 provides a framework for organizations to systematically manage their processes and consistently deliver products that meet customer expectations. The standard incorporates management principles such as customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision-making, and relationship management (ISO 9001, 2015).

The success of a construction project relies on the knowledge, skills, creativity, and motivation of its employees and partners. Construction firms should demonstrate commitment to their employees, offering opportunities for development and growth. The availability of skilled personnel and quality construction materials, including raw materials, finished products, components, and parts, is essential for achieving construction quality. Additionally, technology and innovation in construction machinery and equipment play a significant role in modern construction, directly impacting project progress and quality (Wysocki, 2014; Crawford, 2002).

In summary, quality management in construction aims to satisfy customers, meet requirements, ensure fitness for purpose, and deliver products that are suitable for use. It should be a non-

negotiable aspect of construction projects, as it increases the likelihood of project success and customer satisfaction.

#### **2.2.4 Quality planning**

The process of planning quality management involves the identification of quality requirements and standards for the project and its deliverables. It also entails documenting how the project will ensure compliance with these quality requirements. This process plays a crucial role in providing guidance and direction for managing and validating quality throughout the project.

According to Nicholas and Steyn (2008), quality planning instills confidence by ensuring that all necessary measures for maintaining quality have been carefully considered. It involves the identification of relevant quality standards for the project and devising strategies to meet them (PMI, 1996).

#### **2.2.5 Quality assurance**

Quality Assurance represents a modern approach to achieving quality in production, moving away from traditional inspection and quality control systems. Its focus is on ensuring lasting and continuous improvement by proactively planning and preventing problems at their source, emphasizing prevention rather than detection of non-conformance. This involves establishing robust quality management systems, assessing their adequacy, conducting system audits, and reviewing the system itself (Harris & McCaffer, 2002).

Despite the wealth of site experience accumulated over the years, a significant number of building contracts still result in client dissatisfaction and complaints against contractors (PMI, 1996). To implement quality assurance, an organization must establish and maintain a quality management system as part of its day-to-day operations. However, some contractors view standardizing procedures as adding unnecessary layers of bureaucracy, particularly in complex and dynamic construction environments (Chung H.W., 1999).

Unfortunately, the adoption of quality assurance in the construction industry has primarily been driven by clients. Forward-thinking clients consider contractors' ability to consistently "do it right the first time" when awarding contracts, thus emphasizing the underlying philosophy of quality assurance. There is a growing trend toward making the implementation of a quality system a contractual requirement. Contractors who wish to remain competitive and not be excluded from bidding opportunities should not delay in establishing a quality system within their organization. Even in the absence of external pressure, they will find themselves at a

disadvantage compared to competitors who have improved their productivity through effective quality management (Chung H.W., 1999).

Many government bodies responsible for public works and housing, as well as public utilities companies, now insist on effective or certified quality systems as prerequisites for tendering. Private developers with major projects in planning are expected to follow suit. The basis of competition in the construction industry is shifting from price alone to a combination of price and quality. Therefore, contractors should act promptly in establishing a quality system within their organization to avoid being left behind. Evidence from Australia has shown that "quality does not cost, it pays," as demonstrated by an analysis of various building projects (Roberts, 1991).

By implementing a proactive quality system, which typically incurs a cost of approximately 1% of the project value (known as prevention cost), the expenses associated with repairs and other issues (termed failure cost) can be reduced from 10% to 2%. This translates to a significant saving of 7%. The economic advantages of preventive measures are evident (Chung H.W., 1999). While there is an initial cost associated with establishing a quality system, the long-term impact on project costs is a reduction in rework. This, in turn, leads to savings in failure costs and contributes to improved overall project quality.

### **2.2.6 Quality control**

Quality control (QC) is an ongoing process that involves monitoring, evaluating, and taking corrective actions to ensure the planned quality outcomes are achieved (Nicholas & Steyn, 2008). It entails monitoring specific project results to determine their compliance with relevant quality standards and identifying ways to address any unsatisfactory performance. Clear, complete, and accurate contract documents play a crucial role in describing the facility being constructed and conveying the owner's intentions regarding its characteristics and purpose.

Project quality control focuses on identifying the causes of defects or failures that occur during project implementation and recommending necessary corrective actions to achieve the desired quality levels. It is closely connected to quality assurance, where assurance activities ensure the application of appropriate quality standards and operational definitions. Quality control activities, on the other hand, monitor and record the outcomes of quality assurance, measure

quality performance, and propose corrective actions as part of the overall quality management plan. These activities form the foundation for employing continuous improvement methodologies throughout the project implementation process (MYMG TEAM · APRIL 12, 2011).

In the manufacturing industry, including the production of ready-mixed concrete and fabrication of precast units, quality control refers to the activities carried out on the production line to prevent or eliminate causes of unsatisfactory performance. Key functions of quality control in this context include controlling incoming materials, monitoring production processes, and testing the finished product. Prior to commencing production, an assessment is made to determine the minimum required quality to meet specified requirements and establish consistent methods to achieve that quality. For example, in concrete production, the target mean strength is determined based on the specified characteristic strength and estimated variability. Throughout production, the concrete strength is continuously monitored through routine testing and statistical analysis of test results, enabling early detection of significant changes in mean strength or variability (MYMG TEAM · APRIL 12, 2011).

In the construction industry, it is common practice to have separate contracts for design and construction, with the designer also assuming the role of construction supervision. The quality of the final construction is ensured through inspection and testing carried out during the construction process. For instance, the quality of materials like concrete is assessed through random sampling and testing, and a comprehensive inspection of the completed works is conducted before final acceptance. However, this "inspectorial system" of quality control has a significant drawback as it primarily identifies mistakes after they have occurred.

One of the limitations of this approach is that certain defects may remain hidden and not surface until years later. For example, even high-strength concrete can be defective if not properly compacted and cured, and the potential risk of steel corrosion may not become apparent until much later. Moreover, many building defects are concealed during subsequent construction stages, making it challenging to assess the quality of the completed works solely through final inspections. Unlike consumer goods, it is extremely difficult, if not impossible, to replace defective building work.

Regular supervision by the contractor's staff plays a crucial role in ensuring quality. However, there are often commercial and organizational pressures that prioritize speed over quality. In

some cases, poor workmanship may be tolerated to meet productivity targets or due to labor constraints. To demonstrate a commitment to quality, senior management must allocate sufficient resources on-site to prevent any compromise on quality.

The documentation requirements of a quality system are closely aligned with the above-mentioned fundamental functions. The commitment of top management to quality is expressed through a quality policy statement. This policy is further elaborated in a quality manual, which outlines the expectations of management regarding quality assurance. The specific methods and procedures for achieving quality objectives are detailed in various quality procedures and work instructions. The actual implementation of these processes is documented through written records.

In summary, while the traditional approach of inspection and testing during construction helps control the quality of building projects, it does have limitations in identifying hidden defects or issues that may arise in the future. Regular supervision by the contractor's staff, along with a strong commitment to quality from senior management, is essential. Proper documentation of the quality system ensures that the required procedures and instructions are followed and provides evidence of adherence to quality standards.

### **2.2.7 Quality Management Principles**

Quality management principles are fundamental concepts and guidelines that organizations can use to establish and improve their quality management systems. These principles provide a foundation for effective quality management practices and help organizations achieve their quality objectives. (8 Key Principles of Quality Management, 2022)

A key standard within the ISO 9000 family is ISO 9001, which focuses on establishing a quality management system that effectively meets customer needs. Developed by the International Organization for Standardization, ISO 9001 serves as a framework for organizations to manage their quality-related processes.

The ISO 9001 Quality Management System standards are implemented with the aim of guaranteeing customer satisfaction in relation to the products and services they seek. By standardizing minimum quality management system requirements, ISO facilitates mutual benefits for both suppliers and customers. These standards also enable the establishment of

contractual agreements between parties, with customers evaluating whether products or services provided by suppliers conform to customer specifications and requirements.



**Figure 1 ISO 9000, 2015: 7 Quality management. (2015) online**

Construction firms should prioritize the satisfaction of both internal and external customers, emphasizing the development and well-being of their employees. The availability of skilled personnel, high-quality construction materials, and advanced technology are essential for achieving construction excellence. Continuous improvement can be realized by delivering value to customers, reducing waste, optimizing resource utilization, and enhancing responsiveness to customer needs.

The quality of construction is heavily dependent on several factors, including the availability of skilled personnel and construction materials, such as raw materials, finished products, semi-

finished products, components, and parts. Additionally, the use of advanced technology and innovative machinery and equipment is vital for modern construction practices. These factors directly have an effect on the progress and quality of construction projects.

The concept of continuous improvement can be achieved by adding value to customers through the introduction of modern, new, and innovative products and services. It also involves minimizing waste and associated costs, effectively utilizing resources to enhance productivity, and improving responsiveness while reducing customer complaints and poor-quality inputs to construction activities.

### **2.2.8 QMS in Ethiopia Construction Projects**

Ethiopia became the 68th member of the International Organization for Standardization (ISO). Recognizing the need for quality control, the Ethiopian Standards Institute was established in 1972. Quality was regarded as a crucial component of development infrastructure by the Ethiopian government, particularly since the expansion of agricultural product exports in the 1940s.

The process of obtaining Quality Management System (QMS) certification was challenging and costly for Ethiopian industries due to the absence of certified organizations capable of certifying local companies. However, in February 2009, the Quality and Standards Authority of Ethiopia, now known as the Ethiopian Conformity Assessment Enterprise, acquired system certification and localized the certification process. This allowed the Ethiopian Conformity Assessment Enterprise to issue internationally recognized certificates not only to construction companies but also to other types of businesses. The Ethiopian Quality Standard Agency also provides training and technical support for QMS implementation.

### **2.2.9 Purpose of quality management in the construction**

The purpose of quality management in the construction sector is to ensure that construction projects meet or exceed the expectations and requirements of stakeholders, including clients, regulatory authorities, and end-users. Quality management is essential throughout the entire project lifecycle, from planning and design to construction, commissioning, and handover. Here are some key purposes of quality management in the construction sector:

- Customer Satisfaction
- Compliance with Standards and Regulations
- Risk Management
- Cost Control
- Reputation and Branding
- Continuous Improvement
- Safety and Sustainability

Quality management in a construction project begins with the careful development and review of requirements to ensure they align with established guidelines. These requirements are then reflected in criteria and design documents that accurately address the project's needs. The responsibility for setting quality standards lies with the designer, while the contractor is responsible for adhering to these standards during the construction process.

According to Rumane (2018), construction project quality management involves fulfilling the owner's needs within the defined scope of work, budget, and schedule to satisfy the requirements of the owner or user.

The purpose of Construction Quality Management (CQM) is for the developer, in coordination and cooperation with the contractor, to ensure that the quality specified in the plans and specifications is achieved. CQM requires joint efforts from both the contractor and the government. The contractor holds primary responsibility for producing construction that complies with plans, specifications, and accepted industry standards, while the government oversees and assures quality.

Emphasizing the importance of preventing mistakes, it is more efficient in terms of time and cost to establish a robust quality management plan rather than attempting to correct errors later. Investing upfront in creating a coherent and comprehensive quality management plan yields significant benefits throughout the project's lifespan.

Quality management in construction involves developing and reviewing requirements, setting standards, and ensuring adherence to plans and specifications. The goal is to meet the owner's needs within the defined project parameters. The government collaborates with the contractor

to ensure that quality standards are met, and the upfront investment in a quality management plan yields long-term project benefits.

### **2.3 Empirical Literature Review**

The empirical literature offers empirical evidences of quality management practices in Real estate projects. Quality Management has gradually been accepted by real estate Firms as an initiative to solve quality problems and to meet the needs of the final customer and stakeholders. Therefore, this section is concerned with other studies conducted on other area in similar discipline.

**Study 1:** "Exploring the Relationship between Quality Management Practices and Project Performance in Construction Projects" by Khalid Almarshad and Mohammed Alghamdi (2018)

- **Methodology:** The study collected data through a questionnaire survey distributed to construction professionals involved in different construction projects. The questionnaire assessed the implementation of quality management practices and collected information on project performance indicators.
- **Findings:** The study found a positive relationship between the implementation of CQM practices and various project performance indicators. It revealed that projects with effective quality management practices exhibited better cost performance, adherence to schedules, and higher levels of customer satisfaction. The study emphasized the significant role of quality management in achieving project objectives and enhancing overall project success.

**Study 2:** "Critical Success Factors for Construction Quality Management: A Review" by Chuan Chen and Yucheng Liu (2019)

- **Methodology:** This study conducted a comprehensive review of existing research on critical success factors for CQM. It synthesized findings from multiple studies to identify common themes and factors associated with successful quality management in construction projects.
- **Findings:** The review study identified several critical success factors for CQM. These factors included leadership commitment to quality, effective

communication among project stakeholders, a competent and well-trained workforce, a culture of continuous improvement, and the use of quality control tools and techniques. The study emphasized the importance of adopting a holistic and integrated approach to quality management, where these factors are interconnected and mutually reinforcing.

**Study 3:** "The Impact of Quality Management on Construction Project Performance: A Meta-Analysis" by Qiping Shen et al. (2020)

- **Methodology:** This meta-analysis synthesized findings from multiple empirical studies on the relationship between CQM and construction project performance. It analyzed data from various research papers to draw overarching conclusions.
- **Findings:** The meta-analysis revealed a positive impact of quality management practices on construction project performance. It found that projects with effective CQM implementation demonstrated better cost control, schedule adherence, and overall quality outcomes. The study highlighted the significant influence of quality management on improving project success and recommended the adoption of robust quality management practices in construction projects.

**Study 4:** "Critical Success Factors for Construction Quality Management in Real Estate Development Projects" by Jie Hu et al. (2018)

- **Methodology:** This study examined critical success factors for CQM in real estate development projects. The research methodology involved a comprehensive literature review and expert interviews to identify key success factors.
- **Findings:** The study identified critical success factors for CQM in real estate development, including strong leadership commitment to quality, effective communication and collaboration among stakeholders, clear quality objectives and performance measures, competent and trained personnel, and the use of quality control tools and techniques. The study emphasized the importance of these factors in ensuring quality outcomes in real estate development projects.

**Study 5:** "Enhancing Construction Quality Management in Real Estate Development: A Case Study Approach" by Yewande A. Daramola et al. (2020)

- **Methodology:** This study employed a case study approach to investigate the implementation of CQM in real estate development. Multiple real estate development projects were analyzed to identify best practices and challenges.
- **Findings:** The study highlighted the significance of proactive quality management practices in real estate development. It identified key practices such as early identification and resolution of quality issues, continuous monitoring and feedback, and the involvement of all stakeholders in quality decision-making. The study emphasized the need for integrating quality management into the organizational culture of real estate development firms to ensure sustained quality outcomes.

These empirical studies on Construction Quality Management in real estate development highlight the importance of effective quality management practices for successful project outcomes. They identify key practices such as clear quality objectives, rigorous quality control measures, effective communication and collaboration, competent personnel, and proactive quality management approaches. The studies also emphasize the challenges involved in implementing quality management in real estate development projects and underscore the need for integrating quality considerations throughout the project lifecycle.

## **2.4 Conceptual framework**

The literature on Quality Management Systems (QMS) has identified several distinct dimensions related to QMS. These dimensions form the basis of a comprehensive framework that encompasses various features of QMS. The framework emphasizes the key dimensions of QMS outlined in the ISO 9001:2015 standard, recognizing their critical value. These dimensions have been widely acknowledged by experts and authors in the field.

The conceptual framework captures these dimensions and includes a list of project management responsibilities to assess the practice and implementation of QMS. The conceptual framework provides a structure for understanding the relationships and variables involved in the research study. In the context of the research title, "The Effect of Quality Management System on Project Success: In the Case of Hosea Real Estate," the following conceptual framework can be considered:

### **2.4.1. Dependent Variable:**

- Project Success: This variable refers to the overall achievement and positive outcomes of construction projects undertaken by Hosea Real Estate Construction. Project success will be measured by factors such as completion within budget and timeline, client satisfaction, and compliance with quality standards. Based on the specific objectives outlined for my research study the constructs for the Dependent Variable (DV) would be:

#### 1. Project Success:

##### a. Project Performance:

- Cost performance (e.g., adherence to budget, cost overruns)
- Time performance (e.g., adherence to schedule, delays)
- Quality performance (e.g., compliance with specifications, customer satisfaction)

##### b. Project Effectiveness:

- Achievement of project objectives
- Stakeholder satisfaction (e.g., client, end-user)
- Alignment with organizational goals

##### c. Project Efficiency:

- Resource utilization
- Productivity
- Waste reduction

##### d. Project Reputation and Competitiveness:

- Industry reputation
- Competitive advantage
- Market share

##### e. Customer Satisfaction:

- Perceived quality of the final product
- Likelihood of repeat business
- Referrals and recommendations

The constructs for the DV, Project Success, encompass the key dimensions of project performance, effectiveness, efficiency, reputation, and competitiveness, as well as customer satisfaction. These constructs align with the specific objectives and will enable the researchers to examine the influence of the QMS on different facets of project success, including cost, time, quality, stakeholder satisfaction, resource utilization, industry reputation, and customer

perception. The analysis of these constructs will provide a comprehensive understanding of how the implementation of the QMS affects the overall success of Hosea Real Estate's construction projects.

#### **2.4.2 Independent Variable:**

- Quality Management System (QMS): This variable represents the implementation and effectiveness of the quality management practices within Hosea Real Estate Construction. It includes elements such as quality planning, quality control, quality assurance, and continuous improvement practices.

#### **2.4.3 Mediating Variables:**

- Quality Control: This variable represents the processes and activities implemented to ensure that the construction work adheres to established quality standards. It involves inspections, testing, and corrective actions to identify and rectify defects or deficiencies.

- Quality Assurance: This variable encompasses the systematic activities and processes that aim to provide confidence that the project will satisfy the defined quality requirements. It involves quality audits, document control, and compliance verification.

- Communication and Coordination: This variable represents effective communication and coordination among project stakeholders, including contractors, suppliers, and clients. It includes clear and timely exchange of information, collaborative decision-making, and a shared understanding of project goals and requirements.

#### **2.4.4 Moderating Variables:**

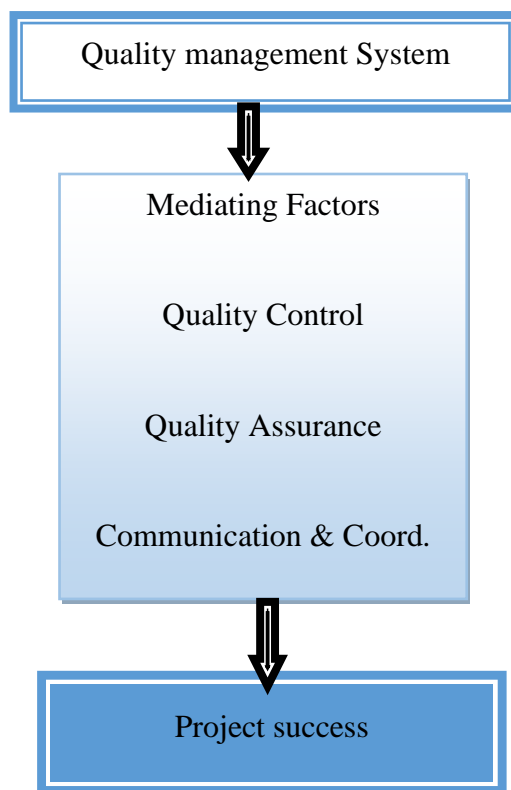
- Organizational Culture: This variable refers to the values, beliefs, and norms within Hosea Real Estate Construction that influence the adoption and implementation of quality management practices. It includes the commitment to quality, employee empowerment, and the emphasis on continuous improvement.

- Leadership and Management Commitment: This variable represents the support and commitment of top management in promoting and integrating quality management practices into the organization's processes and culture. It includes leadership involvement, resource allocation, and setting quality objectives.

- Project Characteristics: This variable considers the unique characteristics of construction projects, such as size, complexity, and type, which may influence the relationship between the quality management system and project success.

The conceptual framework suggests that the quality management system (independent variable) implemented within Hosea Real Estate Construction impacts project success (dependent variable) through mediating variables such as quality control, quality assurance, and effective communication and coordination. The relationship between the independent and dependent variables can be influenced or moderated by factors such as organizational culture, leadership and management commitment, and project characteristics.

This conceptual framework provides a basis for investigating the effect of the quality management system on project success in the context of Hosea Real Estate Construction and helps guide the research design, data collection, and analysis processes. The conceptual model illustrates the relationships among these variables, providing a description of the practice and extent of QMS implementation. The study was guided by this formulated conceptual framework, as depicted in the figure 2.



**Figure 2 Conceptual Frame Work to analyze the Practice and Implementation of QMS (researcher own source)**

This conceptual framework provides a structured approach to understanding the key components and interrelationships of Construction Quality Management. It highlights the importance of a well-defined Quality Management System, leadership commitment, quality planning, competent workforce, communication and collaboration, quality control, continuous improvement, supplier and subcontractor management, performance measurement and feedback, and regulatory compliance. Implementing this framework can help organizations achieve and maintain high-quality standards in construction projects.

## **Chapter Three- Research Design and Methodology**

### **3.1 Introduction**

This chapter provides a detailed explanation of the methodology employed in the study. It covers various aspects, including the research approach, research design, population and sampling methods, data collection instruments, presentation, data analysis techniques, and ethical considerations.

### **3.2 Research Design and Approach**

The general map of how research is going to be performed would be structured in its research design. Research design illustrates almost the basic activities that are essential to carry out research. The connection between the data to be collected, the conclusion to be drawn, and the initial questions of the study is based on sound logic. (Yin R.K, 2003).

This study employed a mixed methods design, which involves the collection, analysis, and integration of both quantitative and qualitative data within a single research study. The use of this approach allowed for a comprehensive understanding of the research topic, as it combined the strengths of both quantitative and qualitative data. The quantitative data was collected through a questionnaire survey, while the qualitative data was obtained through interviews. This combination of methods not only generated quantitative data but also provided in-depth qualitative insights, thereby enhancing the validity and robustness of the findings. Hurmerinta-Peltomaki and Nummela (2006) have noted the value-added benefits of utilizing mixed methods, as compared to relying solely on a single method.

Given that the objective of this study was to assess the implementation of Quality Management Systems (QMS), it falls under the descriptive type of research. A descriptive survey method

will employed to measure and describe the characteristics will be outlined in the research questions. The use of the descriptive survey method allows for the examination and interpretation of existing conditions, practices, processes, trends, effects, attitudes, beliefs, and other relevant factors pertaining to QMS implementation.

### **3.3 Types and sources of data**

For this study, a combination of primary and secondary data sources will be used. As suggested by Kothari (1985), questionnaires, interviews, and direct observations were identified as the most significant data collection tools. To gather the necessary information, a questionnaire will be developed using a five-level Likert scale, as recommended by Cooper and Schindler (2008). The Likert scale was chosen for its ability to measure respondents' attitudes on a scale of 1 to 5, indicating their level of disagreement or agreement, disapproval or approval towards the presented attributes or factors in the form of questions.

To collect primary data, both closed and open-ended questionnaires will be utilized, along with interviews. The collected primary data will go through checking, filtering, and subsequent entry for further statistical analysis. The SPSS software will be employed for statistical analysis, utilizing methods such as ranking, weighted average, mean, and standard deviation. These analytical techniques aided in deriving meaningful insights from the collected primary data.

### **3.4 Target Population and Sampling**

The target population for this study was one of the real estate construction firms found in Addis Ababa. This real estate company was selected using random sampling techniques from a list of real estate Companies that had implemented QMS in their organizational system. The company is well organized and runs projects in Addis Ababa. The population size of the study will be all (40) of the permanent employees of Hosea Real Estate out of which 15 personnel who are working directly on project managerial and project expert levels were selected purposively.

### **3.5 Data analysis and interpretation**

Analysis and discussion will be done based on the primary & secondary data obtained. The research questions will be addressed one at a time. Statistical results will be described in a way

that it is performed to answer the research question. The statistical tools are going to be aligned with the objectives of the research. Moreover, the data analysis and interpretation process for the research will involve a combination of quantitative and qualitative methods.

#### 1. Quantitative Analysis:

For the analysis of quantitative data obtained from structured questionnaires, statistical tools will be employed. The specific statistical tools and techniques will be aligned with the research objectives and research questions. Some common statistical methods that can be used include:

- Descriptive statistics: Descriptive statistics such as mean, median, standard deviation, and frequency distributions will be used to summarize and describe the quantitative data.
- Inferential statistics: Inferential statistical techniques, such as correlation analysis and regression analysis, may be employed to examine the relationships between variables and determine the effect of the Quality Management System (QMS) on project success.
- Rating system: A formulated rating system, such as Excellent, Very Good, Moderate, and Unsatisfactory, can be used to summarize and conclude the practice and implementation of the QMS based on participants' responses. This will provide an easy understanding of the level of practice and implementation of the QMS in the company.

#### 2. Qualitative Analysis:

For the analysis of qualitative data obtained from interviews, or focus groups, or open-ended survey questions, a qualitative data analysis approach will be used. Content analysis, which involves identifying and coding text into different themes, can be employed as a systematic method of analyzing qualitative data. The transcribed qualitative data will be analyzed to identify patterns, themes, and trends related to quality management practices and their impact on project success.

#### **Data interpretation:**

The interpretation of the analyzed data will involve a thorough examination of the statistical results and qualitative findings. The results will be discussed in the context of the research questions and objectives. The statistical results will be described in a way that directly addresses the research questions and provides insights into the effect of the Quality Management System on project success. The qualitative findings will be presented through

organized themes and categories, allowing for a deeper understanding of the experiences and perspectives of the participants.

At the end of the study, a conclusion will be drawn based on the findings from the data analysis. The conclusion will provide a summary of the key findings and their implications for the relationship between the Quality Management System and project success in Hosea Real Estate Construction. Additionally, based on the research findings and relevant literature, recommendations will be provided to enhance the practice and implementation of the Quality Management System and improve overall project success in the construction industry.

### **3.6 Reliability and Validity Analysis**

Reliability and validity are important considerations when analyzing the research findings. According to Fiona Middleton (2023), credibility in qualitative research is akin to internal validity in positivist research, ensuring that the study accurately measures what it intends to test without any confounding factors. In qualitative research, the question of consistency between the findings and reality arises.

To establish credibility, one crucial factor to consider is triangulation. Triangulation can be achieved in two ways: utilizing multiple data collection methods and ensuring a diverse range of informants. By employing various methods and involving different perspectives, researchers can enhance the consistency and reliability of the findings.

Another step emphasized by Fiona Middleton (2023) to enhance credibility is ensuring the honesty and voluntary participation of the respondents. Participants should be informed of their right to withdraw at any point, which encourages openness and ensures that the data collected is only from individuals willing to share valuable information.

In the research paper incorporating these strategies, such as triangulation through diverse data collection methods and informants, as well as ensuring voluntary participation and honesty, will strengthen the credibility, reliability, and validity of the findings. This will contribute to a more robust analysis of the impact of the Quality Management System on project success in the context of Real Estate Construction.

#### **3.6.1 Reliability test**

The reliability test is a crucial instrument in measuring the consistency of an attribute or construct under evaluation. As stated by Mahon and Yarcheski (2002), the lower the variation

in repeated measurements of an attribute, the higher its reliability. Reliability can be equated with the stability, consistency, or dependability of a measuring tool.

Cronbach's alpha is one of the most widely accepted measures of reliability. It assesses the internal consistency of the items within a scale, indicating the extent to which the items in the questionnaire are related to each other. Cronbach's alpha also provides insights into whether a scale is unidimensional or multidimensional. The normal range of Cronbach's coefficient alpha value is between 0 and 1, with higher values reflecting a greater degree of internal consistency. While different authors suggest various acceptable values for internal reliability, the most commonly accepted threshold is 0.70 or higher.

**Table 1 Summary of Scale and Cronbach's alpha value**

No	Variables of the study	Cronbach's Alpha
1	Quality planning	0.77
2	Project success	0.85
3	Quality assurance	0.81
4	Quality control	0.77
5	Effect of QMS practice	0.92
6	QMS culture at Hosea	0.75
	Valid	0.81

Source: Researcher Own, 2024

The table (Table 3.1) summarizes the Cronbach's alpha values for the scales used in the study. The Cronbach's alpha values range from 0.75 to 0.92 for the individual variables, and the overall Cronbach's alpha for the entire questionnaire is 0.81. This range of Cronbach's alpha values is considered high, ensuring the reliability of the questionnaire.

Based on the reliability assessment, the results for the items in the questionnaire are deemed reliable and acceptable. The high Cronbach's alpha values indicate a strong internal consistency among the items, providing confidence in the measurement of the constructs under investigation.

### **3.7 Ethical Consideration**

Ethical considerations in research encompass a set of principles that guide the design and practices of a study. Researchers and scientists are bound by a code of conduct when it comes to data collection from individuals. Human research aims to understand real-life phenomena, explore effective treatments, examine behaviors, and contribute to overall improvements in people's lives. Both the choice of research topic and how the research is conducted involve important ethical considerations.

In this study, measures will be taken to ensure the confidentiality of the data provided by the participants. They were not required to disclose their names, and they were assured that their responses will be treated with strict confidentiality. The purpose of the study clearly communicated in the introductory section of the questionnaire. Additionally, I have made efforts to avoid any form of misleading information or deceptive practices.

By implementing these ethical considerations, I have upheld the principles of integrity, respect for privacy, and protection of participants' rights throughout the research process.

## **Chapter Four- Data Presentation, Analysis And Discussion**

### **4.1 Introduction**

The analysis and discussion of the results are presented in this section. The key findings from the data collection and analysis are discussed in detail, providing insights into the research objectives and questions.

The triangulation of the different data sources, including the questionnaire results, interviews, and document reviews, allowed for a comprehensive understanding of the research topic. The quantitative data analysis using SPSS version 27 provided statistical insights, complementing the qualitative findings from the interviews and document reviews.

The high response rate of 100% from the 40 questionnaires distributed indicates a good level of engagement and participation from the targeted respondents. This suggests that the data collected is representative of the population under study and provides a solid foundation for the analysis and discussion of the research findings.

## 4.2. Demographic Characteristics of the Respondents

The demographic statistics presented in the figure below illustrate the distribution of respondents by gender, age, education level, job position and work experience.

**Table 2 Demographic characteristics of respondents (Source: researcher’s survey, 2024)**

Variable	Group	Frequency	Valid Percent	Cumulative Percent	
Gender	Valid	Female	26	65	65
		Male	14	35	100
		Total	40	100	
Age of respondents	Valid	Less than 25	1	2.5	2.5
		25-30 years	15	37.5	40
		30-35 years	9	22.5	62.5
		35-40 years	11	27.5	90
		Above 40	4	10	100
		Total	40	100	
Educational background	Valid	Degree	22	55	55
		Masters and above	16	40	95
		Diploma	2	5	100
		Total	40	100	
Job category	Valid	Contractor	5	12.5	12.5
		Consultant	1	2.5	15
		Project Manager	1	2.5	17.5
		Project team	24	60	77.5
		other	9	22.5	100
		Total	40	100	
Year of Experience at Hosea Real-estate	Valid	1-5 years	28	70	70
		5-10 years	12	30	100
		Total	40	100	

Participants were asked to indicate their gender by selecting the appropriate option provided (male or female) as shown in the table above. Accordingly, 26 respondents (65%) were female, while the remaining 14 respondents (35%) were male. This indicates that the sample population was dominated by female participants.

The demographic statistics presented in the table above illustrate the seniority of respondents based on age, this data could indicate the level of experience stakeholders present in the project. The majority (37.5%) of the respondents are between 25-30 years, the others (27.5%) are between 35-40 years while the remaining 22.5% and 2.5% is divided amongst 30-35 and less than 25 years old. The concentration of a certain age group could impact projects in terms of knowledge transferred in return impacting quality management. According to Patrick Aubert (2006), productivity increases with age until age 40 and then remains stable after this age. Workers aged 40 and over are roughly 5% more productive than those aged 35-39. For this we can conclude Hosea has the most productive age group of employees.

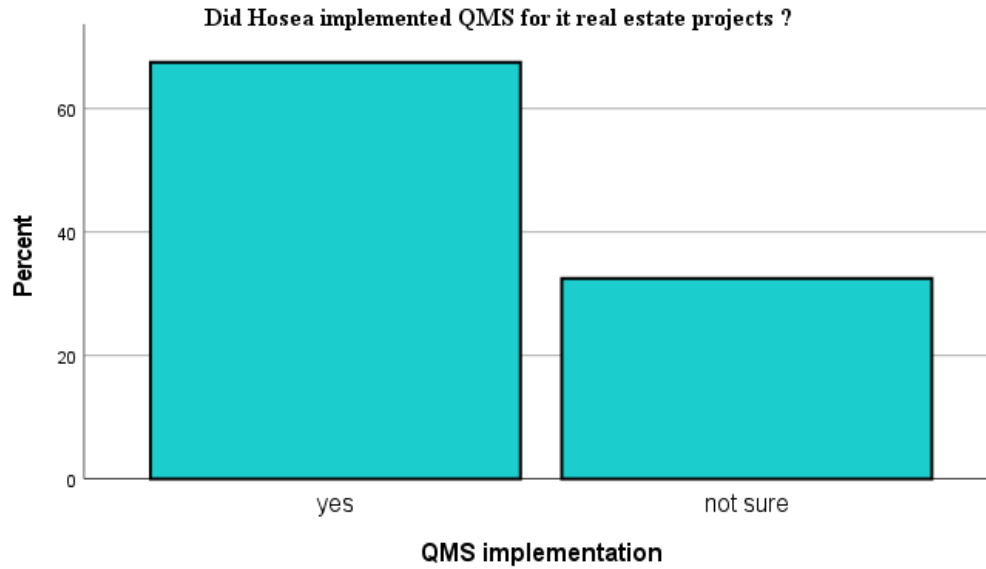
The result in Table 2 indicates that Degree graduates (55%) have more contributions to projects followed by Masters's degree holders (40%), and diplomas (2%). This data implies majority of respondents have the educational level to undertake major projects such as real-estate development construction

This data provides insight into the distribution of job roles and responsibilities among the participants in the study. It suggests the study primarily gathered perspectives from project team members 60%, with some input from other 22.5%(project coordinator, finance, marketing, customer service officers, and HR) job functions as well. Understanding the composition of the sample is important when interpreting and generalizing the findings.

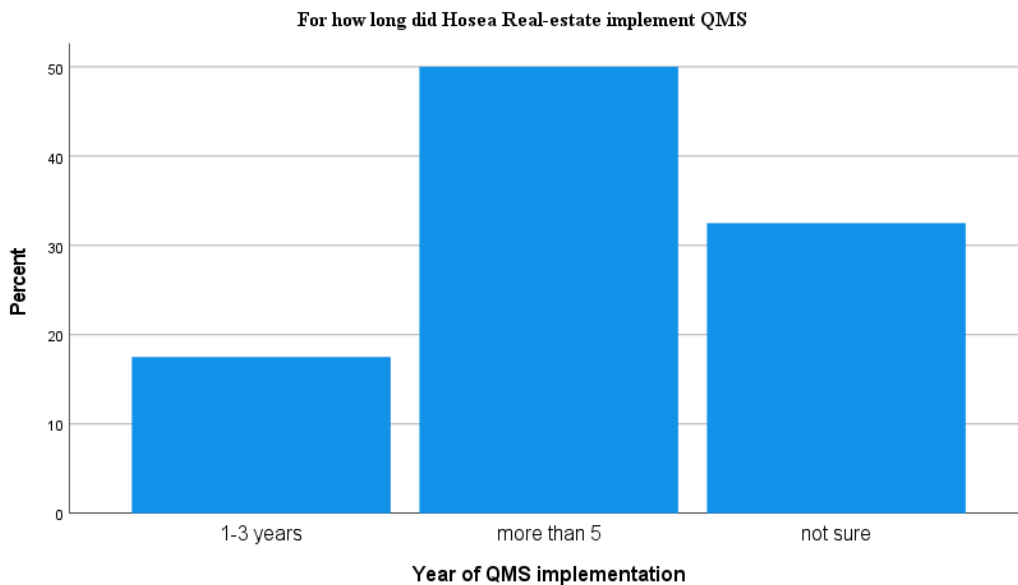
The result in Table 2 also indicates that 70% of the respondents have been working at Hosea ever since Hosea announced its real estate developer sister company in 2020 and 30% were already working at the mother company and still growing with Hosea.

### 4.3 Quality perception of the company

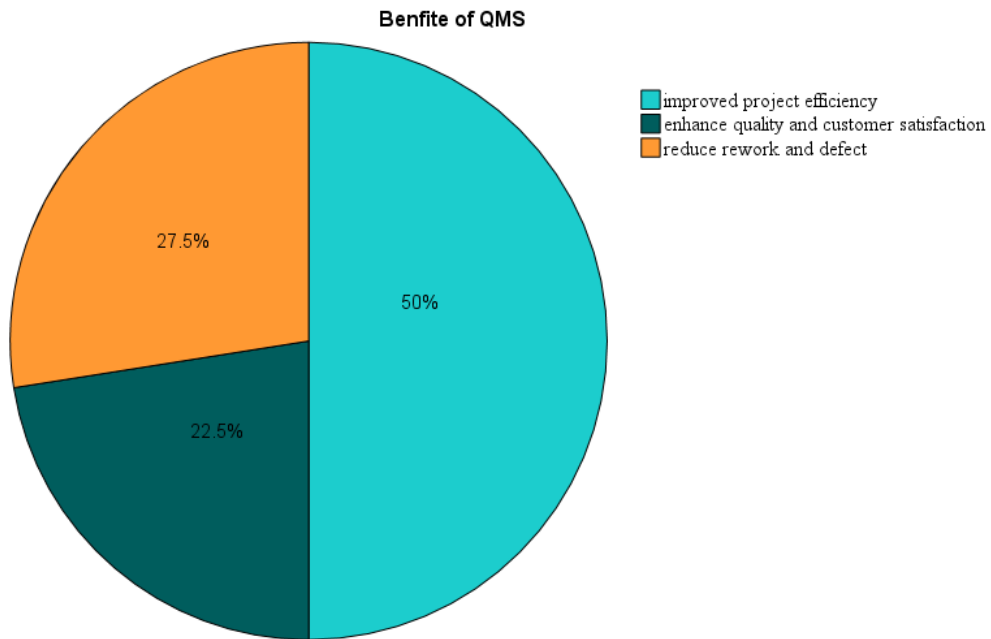
The self explanatory charts in Figures 3,4,5 and 6 provide Hosea's general Perception of the Quality and implementation level of QMS for its real estate construction projects.



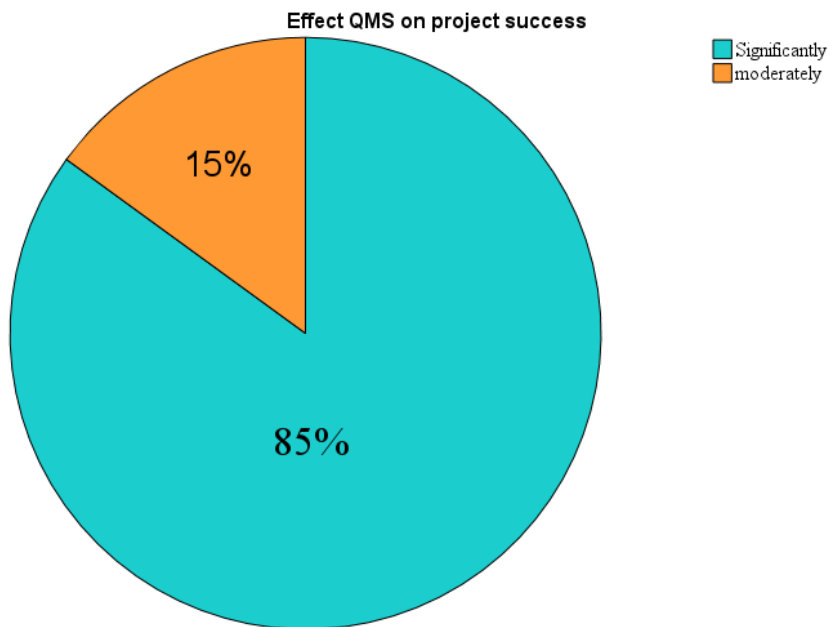
**Figure 3 QMS implementation bar chart (source: researcher's survey,2024)**



**Figure 4. Periode of QMS implementation bar chart (source: researcher's survey,2024)**



**Figure 5. Benefits of QMS implementation Pai chart (source: researcher's survey,2024)**



**Figure 6. The Effect of QMS Implementation on Project Success pai chart (source: researcher's survey,2024)**

## 4.4 Quality Planning

The data presented in the table 3 suggests that the respondents generally agreed with the implementation of key quality planning factors at Hosea real estate. This aligns with the definition of quality planning proposed by Harris and McCaffer (2001), which describes it as the set of activities focused on defining quality system policies, objectives, and requirements, and explaining how these will be applied, achieved, and met. Similarly, quality planning as outlined in the Project Management Body of Knowledge (PMBOK) involves determining quality standards and requirements for the project and its deliverables.

The table shows that most of the quality planning factors received favorable ratings, with the majority of respondents indicating "Agree" or "Strongly Agree" regarding their extent of implementation. This includes elements such as the inclusion of detailed project scope, objectives and deliverables in the quality plan, the incorporation of relevant contract documents, the development of construction programs and sub-programs, and the establishment of quality procedures and handling of nonconformities.

However, the data suggests one potential area for improvement - the "Project quality objectives" factor. Here, the majority of respondents (57.5%) rated this element as "Neutral," indicating a lack of clear understanding or consensus around how well quality objectives are being defined and implemented. This variability, as evidenced by the higher standard deviation and variance for this factor, suggests that the "Project quality objectives" may warrant closer attention and clearer definition within the quality planning and management processes at Hosea Real Estate.

By focusing on strengthening the definition and communication of quality objectives, the organization can potentially enhance the overall effectiveness of its quality planning efforts and ensure a more consistent understanding and implementation of these critical elements across the project team and stakeholders.

**Table 3 Frequencies and percentages of the ratings of Quality planning factors and their extent of implementation at Hosea real estate (Source: researcher’s survey, 2024)**

Description	N	Frequency					Mean	Std. Deviation	Variance
		1	2	3	4	5			
The quality plan includes a detailed project scope, objectives, and key deliverables	40	0	0	0	28 (70%)	12 (30%)	4.30	.464	.215
Quality plan includes relevant contract documents that define the project requirements and specifications.	40	0	0	0	11 (27.5%)	29 (72.5%)	4.73	.452	.204
Project quality objectives	40			23 (57.5%)	6 (15%)	11 (27.5%)	3.70	.883	.779
Provide an organizational chart that illustrates the project's site structure and hierarchy.	40			5 (12.5%)	35 (87.5%)		3.88	.335	.112
Construction program and sub-programs	40			5 (12.5%)	12 (30%)	23 (57.5%)	4.45	.714	.510
procurement, based on the construction program	40		6 (15%)		11 (27.5%)	23 (57.5%)	4.27	1.062	1.128
list of materials and appliances required for the project, along with the verification requirements for each item	40			6 (15%)	17 (42.5%)	17 (42.5%)	4.27	.716	.512
Inspection and test plans	35			6 (15%)	12 (30%)	17 (42.5%)	4.31	.758	.575
The quality plan includes list of quality procedures and work instructions applicable to the project by referring to the company’s Quality Manual and Procedures	40			6 (15%)	11 (27.5%)	23 (57.5%)	4.42	.747	.558
The quality plan includes a system for handling nonconformities and corrective actions.	40			6 (15%)	17 (42.5%)	17 (42.5%)	4.27	.716	.512
List of quality records	40			6 (15%)	12 (30%)	23 (57.5%)	4.40	.744	.554
Frequent internal quality audits	40		6 (15%)		6 (15%)	28 (70%)	4.40	1.081	1.169

## 4.5 Quality Assurance

Based on the data provided in Table 4, the key findings are as follows:

1. Select the appropriate quality management system requirements for each contract scope-based:

- 6 respondents (15%) rated this as 4 (neutral)
- 22 respondents (55%) rated this as 5 (Agree)
- 12 respondents (30%) rated this as 3 (Strongly Agree)
- This suggests that the majority of respondents (85%) agree or strongly agree that the organization is effective in selecting appropriate quality management system requirements based on the contract scope.

2. Specifies the quality management system requirements in tender and contract documents:

- All 40 respondents (100%) rated this as 5 (Strongly Agree)
- This indicates that the organization consistently and effectively specifies the quality management system requirements in the tender and contract documents.

3. Evaluate and select subcontractors on their ability to satisfy specified requirements:

- 11 respondents (27.5%) rated this as 4 (Agree)
- 29 respondents (72.5%) rated this as 5 (Strongly Agree)
- This suggests that the organization places a strong emphasis on evaluating and selecting subcontractors based on their ability to meet the specified quality requirements.

4. Appropriate checking, measurement, or testing of products and keeping proper records:

- 6 respondents (15%) rated this as 4 (Neutral)
- 34 respondents (85%) rated this as 5 (Strongly Agree)
- This indicates that the organization consistently conducts appropriate product checking, measurement, or testing, and maintains some records of these activities to not fully organized way of documenting so there is a bit of gap here that needs attention.

Overall, the data suggests that the organization has robust quality management practices in place, particularly in terms of specifying requirements, evaluating subcontractors, and conducting appropriate product checks and record-keeping. These findings align with the earlier discussion about the organization's generally positive performance in quality planning and implementation.

**Table 4 Frequencies and percentages of the ratings of Quality Assurance factors and their extent of implementation as QA mechanism at Hosea real estate (Source: researcher’s survey, 2024)**

Description	Frequency					Mean	Std. Deviation	Variance
	1	2	3	4	5			
Selects the appropriate quality management system requirements for each contract scope-based			6 (15%)	22 (55%)	12 (30%)	4.15	.662	.438
Specifies the quality management system requirements in tender and contract documents.					40 (100%)	5.00	.000	.000
Evaluate and select subcontractors on their ability to satisfy specified requirements.				11 (27.5%)	29 (72.5%)	4.72	.452	.204
Appropriate checking, measurement, or testing of products and keeping proper records.			6 (15%)		34 (85%)	4.70	.723	.523

## 4.6 Quality Controlling

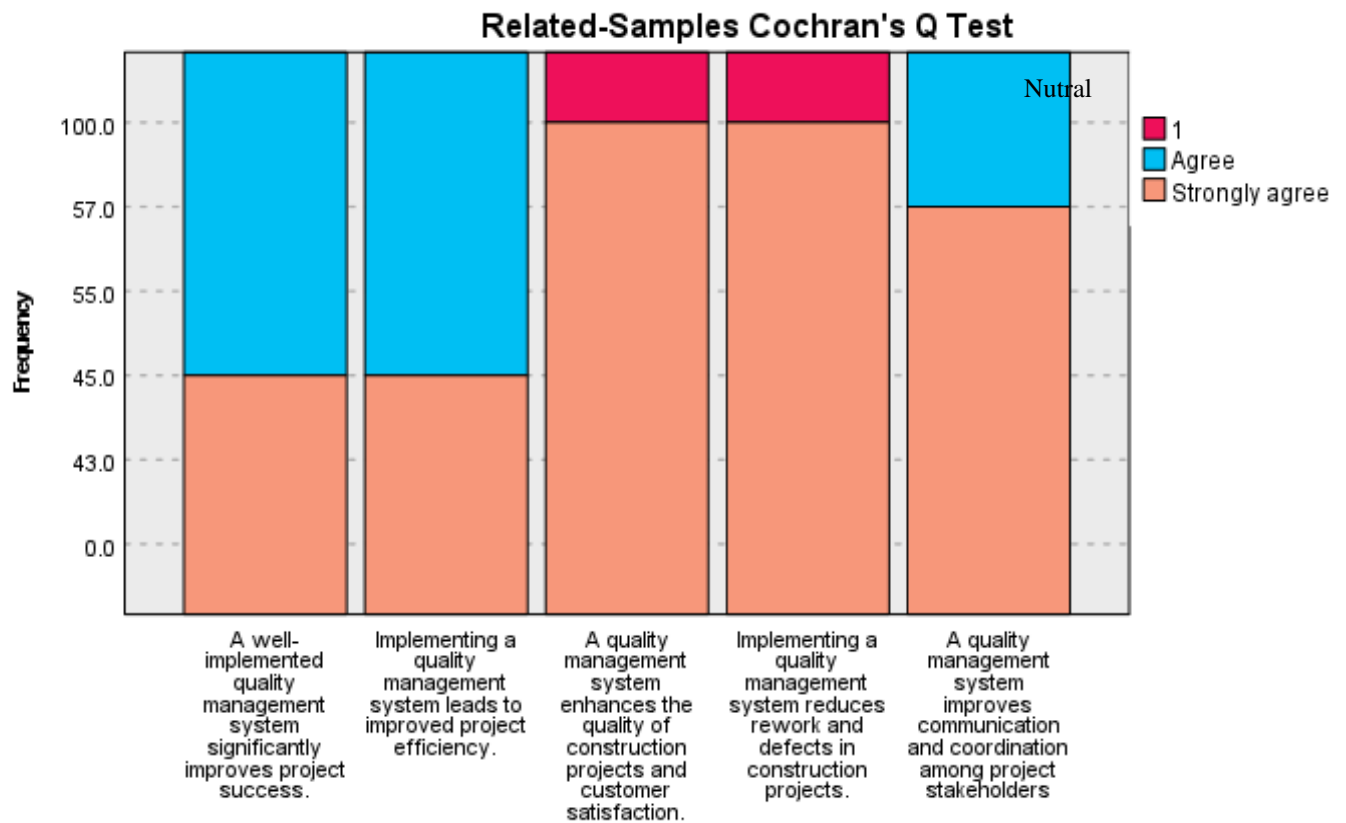
**Table 5 Frequencies and percentages of the ratings of Quality controlling factors and their extent of implementation at Hosea real estate (Source: researcher’s survey, 2024)**

Description	N	Frequency					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Clearly defined quality standards or specifications are established to serve as benchmarks for measuring and evaluating the quality of products	40			5 (15%)	12 (15%)	23 (15%)	4.45	.714	.510
Inspection and Testing	40				11 (27.5%)	29 (72.5%)	4.73	.452	.204
Corrective and Preventive Actions	40				6 (15%)	34 (85%)	4.85	.362	.131
Training on quality control techniques, quality standards, inspection methods, and relevant regulations or industry requirements	40	6 (15%)			23 (57.5%)	11 (27.5%)	3.83	1.279	1.635
Continuous improvement on quality control mechanism	40	6 (15%)			23 (57.5%)	11 (27.5%)	3.83	1.279	1.635

The data above in Table 5 highlights the organization's strengths in areas such as quality standards, inspection and testing, and corrective/preventive actions, while also identifying potential areas for improvement in training and continuous quality improvement.

## 4.7 Effect of Quality management system

The data collected showed that 100% of the respondents have knowledge on how QMS has positive impact on project success and that Hosea have been benefiting from CQMS on it realestat project success mile stone.



**Figure 7. The Effect of QMS and Project Success by related-sample cochran's test (source: researcher's survey,2024)**

## 4.8 Effect of construction Quality management system

Based on the data provided in table 6, the key findings are as follows:

1. Hosea Real Estate Construction has successfully implemented a quality management system:

- The majority of respondents (85%) agree or strongly agree that Hosea Real Estate Construction has successfully implemented a quality management system.

2. The quality management system implemented by Hosea Real Estate Construction is highly effective in ensuring project success:

- While the majority of respondents (57.5%) agree or strongly agree that the quality management system is highly effective, there is some variability in the responses, with a significant number of respondents (27.5%) expressing neutral or negative opinions.

3. There are observable improvements in project success after the implementation of the quality management system at Hosea Real Estate Construction:

- Similar to the previous finding, while the majority of respondents (57.5%) agree or strongly agree that there have been observable improvements in project success, there is some variability in the responses, with a significant number of respondents (27.5%) expressing neutral or negative opinions.

In summary, the data suggests that Hosea Real Estate Construction has successfully implemented a quality management system, but there are some mixed opinions on the effectiveness of the system and the observed improvements in project success. The relatively high standard deviations and variances indicate a lack of consensus among the respondents, which means there is some gap on how QMS implemented by HOSEA is not in action to the extent point they should be.

**Table 6 Frequencies and percentages of the ratings of QMS and their extent of implementation at Hosea real estate construction projects (Source: researcher’s survey, 2024)**

Description	Frequency					Mean	Std. Deviation	Variance
	1	2	3	4	5			
Hosea Real Estate Construction has successfully implemented a quality management system.		6 (15%)	5 (42.5%)	10 (42.5%)	17 (42.5%)	3.85	1.145	1.310
The quality management system implemented by Hosea Real Estate Construction is highly effective in ensuring project success.	6 (15%)		11 (12.5%)	6 (15%)	17 (42.5%)	3.70	1.418	2.010
There are observable improvements in project success after the implementation of the quality management system at Hosea Real Estate Construction.	6 (15%)		11 (12.5%)	6 (15%)	17 (42.5%)	3.70	1.418	2.010

## 4.9 Inferential Analysis

The inferential analysis aims to conclude the broader population parameters based on the sample data collected. This approach recognizes that since the analysis does not include the entire population, the results may contain a certain level of uncertainty Saunders (2010). To address the study objectives, the inferential statistics employed include correlation tests, regression model assumptions, and regression analysis of the gathered data.

### 4.9.1 Correlation Analysis

Correlation analysis was conducted to examine the strength and direction of the relationships among the variables. This technique provides insights into how the variables are associated, including the magnitude and direction of the relationships. For this study, the researchers sought to investigate the relationships between QMS practices and project success in selected real estate construction companies. While there are various correlation tests available, such as Pearson and Spearman, the Pearson correlation test was deemed appropriate given the raw data collected through the survey questionnaire.

**Table 7. Correlation matrix (Source: researcher’s survey, 2024)**

Referring Table 7, the results represent the Pearson r - values for the relationship between

Variables		A	B	C	D	E
A	Pearson Correlation	1				
	Sig. (2-tailed)					
B	Pearson Correlation	.860**	1			
	Sig. (2-tailed)	.000				
C	Pearson Correlation	.767**	.861**	1		
	Sig. (2-tailed)	.000	.000			
D	Pearson Correlation	.869**	.897**	.827**	1	
	Sig. (2-tailed)	.000	.000	.000		
E	Pearson Correlation	.862**	.949**	.919**	.927**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=40

independent variables (A/Quality planning, B/quality assurance, C/factors of QMS and D/ quality control) and dependent variable (project success). In this regard, four QMS practices showed positive and strong relationship with project success. Specifically, A ( $r = .862$ ) and B ( $r = .949$ ), C ( $r = .919$ ) and D ( $r = .927$ ). This implies that there was a positive and statistically strong relationship between QMS practices and project success. I.e., keeping other factors constant, when the value of QMS practices changes, the value of the project success changes in a similar fashion

### 4.9.2 Regression Model Assumptions

In addition to the correlation analysis, the researchers also tested the underlying assumptions of the regression model to ensure the validity and reliability of the subsequent regression analysis.

This step is crucial as regression analysis relies on certain statistical assumptions being met, such as linearity, normality, homoscedasticity, and independence of errors.

### **4.9.3 Regression Analysis**

The final component of the inferential analysis involved conducting a regression analysis. Regression analysis allows the researchers to model and quantify the relationships between the QMS practices and project Success. By employing this statistical technique, the researchers can assess the predictive power of the QMS practices in explaining the variance in project success, while also identifying the relative importance of each QMS practice as a predictor.

Multiple linear regression analysis is a powerful statistical technique, but it relies on certain underlying assumptions being met in order to produce valid and reliable results. Before conducting the regression analysis, it is crucial to test the assumptions of the model to ensure the collected data is an appropriate fit.

Violating the regression assumptions can significantly impact the subsequent interpretation and applications of the multivariate analysis (Hair, 2010). While there are numerous assumptions to consider, the researcher in this study focused on evaluating the major ones that can be readily tested using statistical software like SPSS.

#### **A) Multicollinearity**

Multicollinearity is a crucial assumption in multiple linear regression analysis. It arises when the independent variables exhibit a high degree of correlation with each other, rather than being more strongly associated with the dependent variable.

Hair (2010) posits that a correlation coefficient below 0.90 among the independent variables may not pose a serious multicollinearity concern. However, Tabachnick and Fidell (1996) recommend a more conservative threshold, suggesting that the correlation coefficient should not exceed 0.70 for better inference and interpretation of the study's findings.

Multicollinearity can have detrimental effects on the regression analysis, such as inflating the standard errors of the coefficient estimates and making it challenging to discern the individual contributions of the independent variables. Therefore, evaluating and addressing multicollinearity is a critical step in the regression assumption testing process.

**Table 8 Collinearity Statistics**

		Collinearity Statistics	
Model		Tolerance	VIF
	A	.211	4.732
	B	.134	7.459
	C	.243	4.120
	D	.151	6.619

a. Dependent Variable: E

Correlations were examined by means of the bivariate correlation measure in SPSS. Provided table 8 presents the collinearity statistics for a multiple linear regression model, where the dependent variable is E.

The collinearity statistics include the following information:

Tolerance:

- A: 0.211                      C: 0.243
- D: 0.151                      B: 0.134

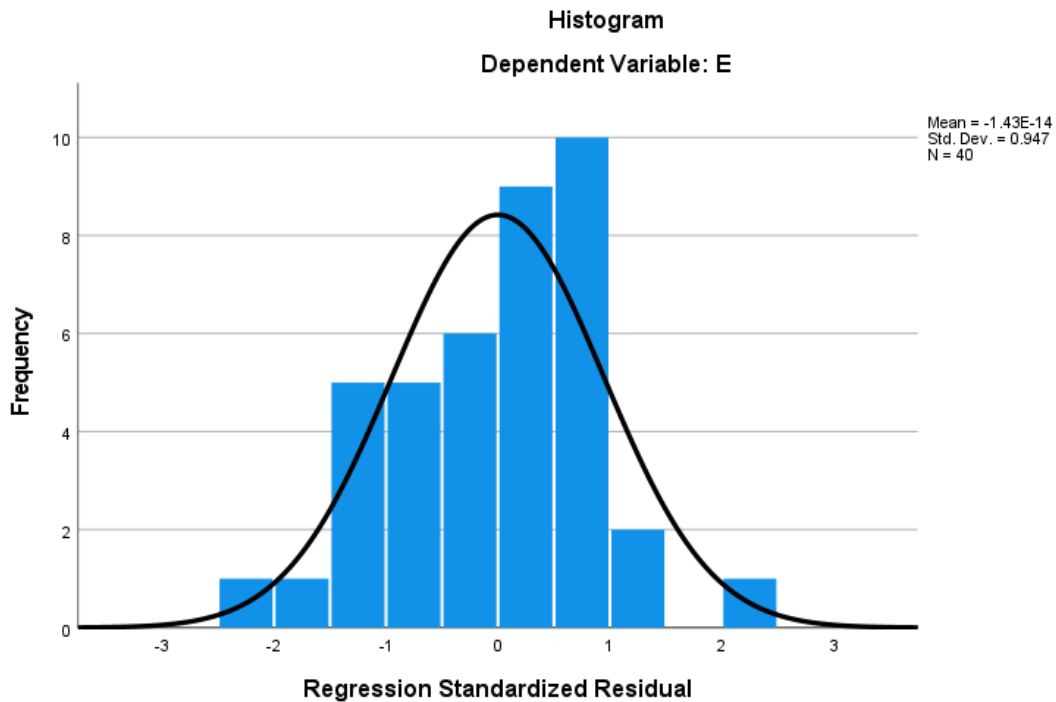
Tolerance values range from 0 to 1, and a low tolerance value (close to 0) indicates a high degree of multicollinearity.

Variance Inflation Factor (VIF):

- A: 4.732                      - B: 7.459
- C: 4.120                      - D: 6.619

The VIF is the reciprocal of the tolerance value, and it measures the degree to which the variance of an estimated regression coefficient is increased due to multicollinearity. A VIF value greater than 5 or 10 is generally considered indicative of concerning levels of multicollinearity.

In this case, the low tolerance values (all below 0.25) and high VIF values (all above 4) suggest the presence of multicollinearity among the independent variables (A, B, C, and D) in the regression model.

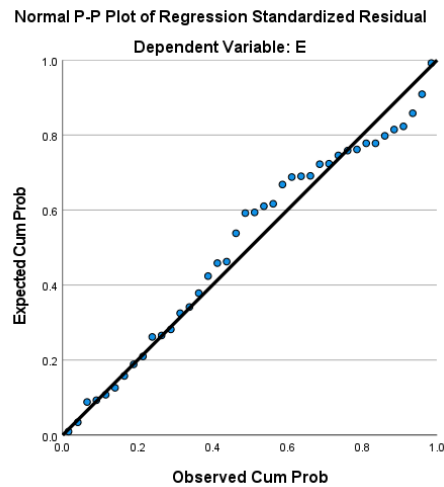


**Figure 8. Normality test histogram (source: researcher's survey,2024)**

The histogram shows the frequency distribution of the regression standardized residuals. The residuals appear to follow a bell-shaped curve, which is an indication that the assumption of normality for the regression model is likely met.

#### C) Linearity

Linearity means that the predictor variables in the regression have a straight-line relationship with the outcome variable. The relationship between the two variables should be linear. This means that when one looks at a scatter plot of scores, it should be seen a straight line (roughly), not a curve. The residuals should have a straight-line relationship with predicted dependent variables scores (Pallant, 2005). If the residuals are normally distributed and homoscedastic, no need to worry about linearity



**Figure 9. Linearity test with p-p plot (source: researcher's survey,2024)**

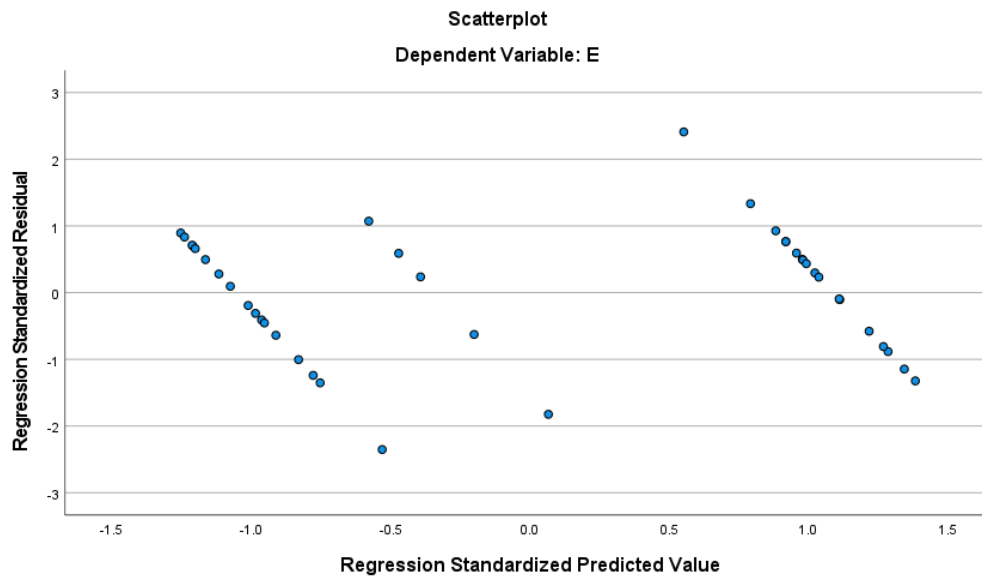
As indicated on the graph linearity is met with some degree of tolerance

#### D) Homoscedasticity

Homoscedasticity is a crucial assumption in linear regression analysis. It refers to the condition where the error term or residuals have a constant variance across all values of the independent variables.

Conversely, the violation of homoscedasticity, known as heteroscedasticity, occurs when the size or variance of the error term varies across the values of an independent variable. This can have significant implications for the validity and reliability of the regression model.

Residual scatter plots provide a visual examination of the homoscedasticity assumption. These plots represent the relationship between the predicted dependent variable scores and the errors of prediction. A random, evenly distributed pattern of residuals suggests the homoscedasticity assumption is met, while a non-random, funneling pattern would indicate the presence of heteroscedasticity.



**Figure 10. scatterplot (source: researcher's survey,2024)**

The scatterplot is used to assess the homoscedasticity assumption of the regression model. A random, evenly distributed pattern of points would indicate that the assumption of homoscedasticity (constant variance of the residuals) is met. Any non-random, funneling, or uneven pattern of the points would suggest the presence of heteroscedasticity, violating the homoscedasticity assumption.

Based on the visual examination of the scatterplot, the distribution of the points appears to be relatively random and evenly spread, suggesting that the homoscedasticity assumption is likely satisfied for this regression model.

#### E) No Auto-correlation/Independent of Errors

The Field (2005) suggested that for any two observations the residual terms should be uncorrelated (or independent). This eventuality is sometimes described as a lack of autocorrelation. This assumption can be tested with the Durbin–Watson test, which tests for serial correlations between errors. Specifically, it tests whether adjacent residuals are correlated. Referring table 9. The DurbinWatson test results was found 1.8. The test statistic can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated. Therefore, as in this study the result 1.8 is almost closed to 2, it can be confirmed

**Table 9 Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.979 <sup>a</sup>	.957	.953	.31174	1.875

a. Predictors: (Constant), D, C, A, B

b. Dependent Variable: E

**1. R-Squared and Adjusted R-Squared:**

- The R-squared value of 0.957 indicates that the independent variables (Predictors) explain 95.7% of the variation in the dependent variable 'E'.

- The Adjusted R-squared value of 0.953 takes into account the number of predictors in the model and provides a more conservative estimate of the model's explanatory power.

**2. Standard Error of the Estimate:**

- The standard error of the estimate is 0.31174, which represents the average amount that the observed values of 'E' vary from the predicted values.

- This statistic provides a measure of the accuracy of the predictions made by the regression model.

**3. Durbin-Watson Statistic:**

- The Durbin-Watson statistic tests for the presence of autocorrelation in the residuals, which is a violation of the assumption of independence of the error terms.

- The value of 1.875 suggests that there is no significant autocorrelation in the residuals, indicating that this assumption is likely met.

Overall, this Model Summary table provides a comprehensive overview of the statistical fit and diagnostics for the regression model with the dependent variable 'E'. The high R-squared value, low standard error, and Durbin-Watson statistic within the acceptable range suggest that the model is a good fit for the data and the underlying assumptions are likely satisfied.

From all this I conclude that the independent and moderat variables have positive effect on the depedent variable project success

**4.9 Analysis and discussion of the interview data:**

I Have conducted a series of semi-structured, face-to-face interviews with construction industry professionals to gather insights on quality management practices, quality issues, and factors affecting the quality of construction projects. A total of 4 respondents were interviewed, including 1 Project Leader, 1 project manager, 1 project coordinator, and 1 site engineer. All

respondents had at least 8 years of experience working on building construction projects across different construction companies including Hosea.

The interviews consisted of seven key questions. The first question explored how the respondents defined quality in their construction projects. The responses indicated that there is no clear or common understanding of quality in the construction industry, with answers ranging from "conformance to specifications" to "work without defects and waste." This lack of a shared definition suggests the need for Hosea to establish a clear, consistent understanding of quality objectives among its workers.

The second interview question asked about the major objectives of quality management for construction companies. The responses varied, with answers including "increasing profit," "eliminating defects," "getting additional work," and "meeting customer satisfaction." This diversity of quality objectives highlights the need for Hosea to align their quality management efforts with their overall business goals and priorities.

When asked about their companies' quality improvement programs, the respondents primarily mentioned quality plan/control/quality assurance measures.

The fifth question explored the key factors that affect the quality of building construction projects. The respondents identified 10 factors, including:

1. Unclear design drawings and specifications
2. Poor workmanship
3. Prioritizing schedule and cost control over quality
4. Ineffective planning and control of work
5. Lack of quality management system implementation
6. Use of poor-quality construction materials
7. Inadequate storage and material handling
8. Inefficient equipment utilization
9. Contractors' financial constraints
10. Skill and experience gaps among contractors' staff

These factors highlight the wide range of project, organizational, and human resource-related issues that can impact construction quality, suggesting the need for a holistic approach to quality management in the construction industry.

The sixth question asks how they evaluate the relation between implemented QMS and project cost, and project schedule. The responses were almost similar to the QMS and frequent project controlling culture had a great role in all there project success they had in the past 6 years

The final question is whether QMS has an impact on companies' Reputation and customer satisfaction. I only received 1 answer for this and it was “ Having QMS in place helps highly on quality of products which in turn plays a huge impact on customer satisfaction and maintain competitive name on the market

Overall, the interview findings reveal the complexity and diversity of quality management practices and challenges in the construction sector. The results underscore the importance of establishing a shared understanding of quality, aligning quality objectives with broader business goals, and addressing the multifaceted factors that can affect construction project quality.

## **Chapter Five: Conclusion And Recommendation**

This chapter has two main parts. The first part presents the conclusion of the study that made from the major results and findings of the study and the second part covers the recommendation that were made based on the findings.

### **5.1 Summary of the Findings**

#### **1. Quality Planning:**

- The study found that Hosea Real Estate has implemented various quality planning practices such as establishing quality objectives, identifying quality standards, and developing quality management plans.

- However, the extent of implementation of these practices was found to be moderate, indicating room for improvement.

#### **2. Quality Assurance:**

- The study revealed that Hosea Real Estate has in place several quality assurance mechanisms, including monitoring and evaluating project activities, conducting quality audits, and implementing corrective actions.

- The extent of implementation of these quality assurance practices was also found to be moderate.

#### **3. Quality Control:**

- The findings suggest that Hosea Real Estate has implemented quality control measures such as inspections, testing, and control charts to ensure project outputs meet the specified quality standards.

- However, the study indicates that the implementation of these quality control practices is not comprehensive and could be strengthened.

#### 4. Effect of Quality Management System on Project Success:

- The study found that the overall quality management system implemented at Hosea Real Estate has a positive and significant effect on project success.

- Specifically, the quality planning, quality assurance, and quality control practices were all found to contribute to improved project outcomes, such as cost, schedule, and customer satisfaction.

The study also found that Hosea Real Estate Company has demonstrated a good practice of communicating the importance and purpose of their quality management system (QMS) to employees. However, the company does not appear to provide regular, formalized training programs related to the QMS for its staff. This suggests a gap in prioritizing employee development and quality-focused training.

Regarding construction projects, the research revealed that while contractors are generally aware of quality concepts, the actual application of quality management practices is relatively low, around 50%. Contractors tend to be more focused on completing projects on time and profitably rather than rigorously implementing quality procedures.

The study identified several common quality problems faced in Ethiopian building construction projects. Key issues include labor-related factors such as skills, training, communication, income, and motivation. Design-related problems, like incomplete or inconsistent design documents, were also found to be a significant contributor to quality challenges.

Despite these gaps, the research suggests that Hosea's implemented QMS has played a crucial role in successfully managing its real estate projects. This has allowed the company to complete projects on time and within budget, contributing to its positive reputation and standing out in the competitive market.

## **5.2 Conclusion**

The study concludes that the quality management system at Hosea Real Estate is moderately effective, with room for improvement in the implementation of quality planning, assurance, and control practices. The research recommends that Hosea Real Estate should:

1. Enhance the implementation of quality planning practices by setting more comprehensive quality objectives and developing detailed quality management plans.
2. Strengthen the quality assurance mechanisms by conducting more frequent audits and implementing more rigorous corrective actions.
3. Improve the quality control measures by implementing a more comprehensive system of inspections, testing, and control charts.
4. Continuously monitor and improve the overall quality management system to ensure its effectiveness in driving project success.
5. Overall, the findings highlight the need for Hosea to strengthen its quality-focused training and development programs for employees, while also addressing labor-related and design-related quality issues in construction projects to further enhance its quality management practices..

## **5.3 Recommendations**

key recommendations for improving construction project quality management based on the provided information:

1. Strengthen ISO 9001 QMS Implementation:
  - Conduct a thorough assessment of the company's current QMS implementation and Identify the gaps and barriers in fully adopting the ISO 9001 standards.
  - Develop a comprehensive action plan to improve the company's adherence to the ISO 9001 QMS requirements.
  - Ensure that all necessary documentation and processes are in place to support effective QMS implementation.
2. Enhance Quality Management Training:
  - Establish a structured and regular quality management training program for all employees.
  - Provide training on quality management principles, tools, and best practices.

- Ensure that the training program is tailored to the specific needs and challenges faced by the construction projects.
  - Encourage employee participation and foster a culture of continuous learning and quality improvement.
3. Improve Quality Management Communication:
- Review the current communication channels and strategies used to inform and engage employees about the quality management system.
  - Develop a clear and comprehensive communication plan that emphasizes the importance and purpose of the QMS.
  - Ensure that the company's vision, mission, and quality objectives are effectively communicated to all stakeholders.
  - Encourage open dialogue and feedback mechanisms to address quality-related concerns and suggestions.
4. Optimize Quality Management Tool Utilization:
- Identify the specific quality management tools and techniques currently used in construction projects.
  - Assess the effectiveness and integration of these tools within the project planning, execution, and control processes.
  - Provide training and support to project teams on the proper use and benefits of quality management tools.
  - Explore opportunities to introduce new or more advanced quality management tools to enhance project quality and performance.
5. Establish Quality Metrics and Monitoring:
- Define clear and measurable quality metrics and key performance indicators (KPIs) for construction projects.
  - Implement robust quality monitoring and reporting systems to track project quality performance.
  - Analyze quality data and use it to identify areas for improvement, develop corrective actions, and drive continuous quality enhancement.
  - Assign a professional who is responsible for controlling QMS and evaluating
  - Regularly review and update the quality management system based on lessons learned and industry best practices.

6. Foster a Quality-Driven Organizational Culture:

- Promote a strong quality-focused mindset and values throughout the organization.
- Empower employees to actively participate in quality management initiatives and problem-solving.
- Recognize and reward individuals and teams who demonstrate a commitment to quality.
- Encourage a blame-free environment where quality-related issues can be openly discussed and addressed.

7. Scalability and Flexibility:

- The quality management system should be designed with scalability and flexibility in mind to accommodate projects of varying sizes and complexities.
- This can be achieved by developing a modular quality management framework that allows for the customization and tailoring of quality planning, assurance, and control practices to suit the specific requirements of each project.

8. Differentiated Approaches:

- For smaller, less complex projects, a more streamlined quality management system can be implemented, focusing on essential quality practices and maintaining an appropriate level of oversight and control.
- For larger, more complex projects, a more comprehensive and rigorous quality management system should be adopted, with enhanced quality planning, assurance, and control measures to address the increased risks and stakeholder expectations.

9. Risk-based Quality Management:

- Hosea Real Estate should incorporate a risk-based approach to quality management, where the quality practices are aligned with the identified risks and the criticality of the project objectives.
- This approach would enable the company to allocate resources and focus quality efforts on the areas with the highest potential impact on project success.

By implementing these adaptations, Hosea Real Estate can ensure that its quality management system remains relevant, effective, and tailored to the unique requirements of its diverse project portfolio, ultimately contributing to the overall success of its projects

## **5.4 Future Studies**

The findings of this study on "The Effect of Quality Management System on Project Success: in the case of Hosea Real Estate" make a valuable contribution in raising awareness and further stressing the importance of quality management systems in the real estate and construction industry. This research has extended the existing knowledge by examining the quality management practices and their impact on project success within Hosea Real Estate, a leading real estate developer.

Future research in this area can be conducted in several ways further to expand the understanding and implications of quality management systems:

1. **Comparative Analysis Across Real Estate Developers:**

The current study focused on Hosea Real Estate, but future research could expand the scope by comparing the quality management practices and their effects on project success across various real estate development companies. This would provide a more comprehensive understanding of the industry-wide trends and best practices.

2. **Diversification of Construction Sectors:**

While this study examined the real estate sector, future research could explore the impact of quality management systems on project success in other construction domains, such as infrastructure projects (roads, bridges, water works, etc.). This would help determine the broader applicability of the findings and identify any sector-specific nuances.

By addressing these future research directions, scholars and industry practitioners can further expand the understanding of quality management systems and their role in driving project success.

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1 to 5 years [    ]

5 to 10 years [    ]

11 to 15 years [    ]

16 to 20 years [    ]

## **Section 2: Quality Management System**

1. Has Hosea Real Estate Construction implemented a formal project quality management system?

a. Yes [    ]

b. No [    ]

c. Not sure [    ]

2. If yes, how long has Hosea Real Estate Construction been implementing a quality management system?

a. Less than a year [    ]

b. 1-3 years [    ]

c. 3-5 years [    ]

d. More than 5 years [    ]

e. Not sure [    ]

## **Section 4: Effect of Quality Management System**

1. To what extent do you believe a quality management system can improve project success?

a. Significantly [    ]

b. Moderately [    ]

c. Slightly [    ]

d. Not at all [    ]

2. Have you observed any specific benefits of implementing a quality management system in construction projects?

a. Improved project efficiency [    ]

b. Enhanced quality and customer satisfaction [    ]

c. Reduced rework and defects [    ]

d. Improved communication and coordination among project stakeholders [    ]

e. Other (please specify) \_\_\_\_\_

**Section 5: Quality Planning**

This section covers questions related to the quality management process and problems encountered in Hosea REAL ESTATE. 50 The scale rating description: 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree. Does your quality plan contain the following?

<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The quality plan includes a detailed project scope, objectives, and key deliverables					
Quality plan includes relevant contract documents that define the project requirements and specifications.					
Project quality objectives					
Provide an organizational chart that illustrates the project's site structure and hierarchy.					
Construction program and sub-programs					
Site layout plan					
procurement, based on the construction program					
list of materials and appliances required for the project, along with the verification requirements for each item					
Inspection and test plans					
Quality plan includes list of quality procedures and work instructions applicable to the project by referring to the company's Quality Manual and Procedures					
The quality plan includes a system for handling nonconformities and corrective actions.					
List of quality records					
Frequent internal quality audits					

## Section 6: Project Success

<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Timely completion of the project within the scheduled timeline is a key indicator of project success.					
Adherence to the project budget is a crucial factor in determining project success					
Client satisfaction is a primary measure of project success at Hosea Real Estate Construction.					
Compliance with quality standards and specifications is essential for successful project delivery.					

## Section 7: Quality Assurance

Do you consider the following factors in your quality assurance mechanism?

<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Selects the appropriate quality management system requirements for each contract scope-based					
Specifies the quality management system requirements in tender and contract documents.					
Evaluate and select subcontractors on their ability to satisfy specified requirements.					
Appropriate checking, measurement, or testing of products and keeping proper records.					

### Section 8: Quality control

Do you consider the following factors in your quality control mechanism?

Description	1	2	3	4	5
Clearly defined quality standards or specifications are established to serve as benchmarks for measuring and evaluating the quality of products					
Inspection and Testing					
Corrective and Preventive Actions					
Training on quality control techniques, quality standards, inspection methods, and relevant regulations or industry requirements					
Continuous improvement on quality control mechanism					

### Section 9: Effect of Quality Management System

Description	1	2	3	4	5
A well-implemented quality management system significantly improves project success.					
Implementing a quality management system leads to improved project efficiency.					
A quality management system enhances the quality of construction projects and customer satisfaction.					
Implementing a quality management system reduces rework and defects in construction projects.					
A quality management system improves communication and coordination among project stakeholders.					

**Section 10: Hosea Real Estate Construction Case Study**

<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Hosea Real Estate Construction has successfully implemented a quality management system.					
The quality management system implemented by Hosea Real Estate Construction is highly effective in ensuring project success.					
There are observable improvements in project success after the implementation of the quality management system at Hosea Real Estate Construction.					

Thank you for taking the time to complete this questionnaire. Your input is greatly appreciated.

## **Section 11: Interview Questions**

- Here are some interview questions related to the effect of a quality management system on project success in the context of Hosea Real Estate :

1. Can you provide an overview of the quality management system currently in place for Hosea Real Estate construction projects? What are the key components or elements of this system?
2. How do you define project success within the context of Hosea Real Estate construction projects? What are the specific criteria or indicators used to measure project success?
3. In your experience, how does the implementation of a quality management system contribute to construction project success? Can you provide examples or specific instances where the quality management system has positively impacted project outcomes?
4. What are the main challenges or obstacles that you have encountered in implementing the quality management system within construction projects? How have you addressed or overcome these challenges?
5. How do you ensure that the quality management system aligns with the unique requirements and characteristics of each construction project undertaken by Hosea Real Estate? How is the system tailored or customized for specific projects?
6. How do you express your project activities from cost, schedule, and quality performance?
7. What role do communication and collaboration play in the successful implementation of the quality management system? How do you ensure that all project stakeholders are aware of and involved in quality-related activities?