



ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS

PROJECT RISK MANAGEMENT PRACTICES IN
CONSTRUCTION PROJECTS: A CASE STUDY OF AYAT
REAL ESTATE

BY
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PROJECT RISK MANAGEMENT PRACTICES IN
CONSTRUCTION PROJECTS: A CASE STUDY OF AYAT
REAL ESTATE

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A Project Work Submitted to the School of Commerce Presented in
Partial Fulfilment of the Requirements for a Master of Arts Degree in
Project Management

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DECLARATION

I, Mikiyas Abrham, declare that this final project work entitled “Project Risk Management Practices in Construction Projects: A Case Study of Ayat Real Estate” represents my work with the guidance of my advisor. It has not been previously included in any project work, dissertation, or report submitted to any university for a degree, diploma, or other qualification. It is conducted to partially fulfill the requirement for the Degree of Masters of Arts in Project Management and submitted to the School of Commerce, AAU.

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CERTIFICATIONS

This is to certify that this final project work prepared by Mikiyas Abrham entitled “Project Risk Management Practices in Construction Projects: A Case Study of Ayat Real Estate” submitted in partial fulfillment of the requirement for the Degree of Masters of Arts in Project Management complies with the regulations of the university and meets the accepted standards concerning originality and quality.

Advisor: _____ Signature: _____ Date: _____

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Abstract

This research is designed to assess the project Risk Management practices in construction projects: a case study of Ayat Real Estate. It is common knowledge that risks arise in the construction industry at every stage of a project's life cycle, and that these risks must be managed as effectively and efficiently as possible using the risk management process. Therefore, this study investigates the gap that exists between the theoretical risk management principles and the current risk management practice at Ayat Real Estate. The research examines the effectiveness of Ayat Real Estate's risk management practices in its CCE Mall apartment project, focusing on areas such as risk awareness, planning, identification, analysis, response, monitoring, and control. The study employed a mixed-methods approach, using both quantitative and qualitative data collected through questionnaires. Accordingly, purposive (judgmental) sampling has been applied to select key respondents. Primary data is collected through questionnaires and it was analyzed by using SPSS version 27, the analyzed data results found from the SPSS software are provided through tables. Key findings reveal that while Ayat Real Estate has a structured approach to risk management, there are opportunities for improvement, particularly in areas such as stakeholder involvement, data utilization, and risk response strategies. Recommendations include implementing a formalized risk management framework, enhancing employee training, and incorporating advanced tools and technologies to enhance risk management capabilities. By implementing these suggestions, Ayat Real Estate improves project outcomes, enhances efficiency, and reduces costs, contributing to a more robust and resilient construction industry in Ethiopia.

Keywords: Risk, Construction, Real Estate, Risk management

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List of Acronym

PMI - Project Management Institute

RMP - Risk Management

APM - Association for Project Management

RBS - Risk Breakdown Structure

IRM - Institute of Risk Management

MoUHC - Ministry of Urban Development, Housing and Construction

CCE – Center of Construction Elements

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CHAPTER ONE

1. INTRODUCTION

This chapter aims to set the tone of the project work by outlining its background, statement of the problem, and objectives. It also lists research questions, the significance of the study to various stakeholders in the construction sector, and the scope of the study. This chapter introduces assessing the risk management practices of Ayat Real Estate.

1.1. Background of the study

We live in a world with an ever-increasing rate of change, and those organizations that respond and adapt to it more effectively tend to succeed and thrive compared to others. The future cannot be known with certainty and the presence of uncertainty requires organizations to manage them and transform themselves regularly if they are to survive and have the possibility of growth and prosperity (Robbins and Judge 2013). It holds for projects as well. Projects are risky by their very nature, which is what makes them innovative and distinctive. Even the most meticulously executed plans have parts that could go wrong or contain uncertainty. The accomplishment of the project's goals will be impacted if these risks are not properly controlled.

Every project is subject to risk. Some can be identified and plans can be put in place if they occur; others cannot and must be dealt with as they occur. A risk is a future event that happens with some probability and results in a positive or negative change to the project (Wysocki 2011). More commonly, though, a risk event is associated with its unwelcome negative result.

According to the Oxford Advanced Learner's Dictionary (2000), risk is defined as "the chance of failure or the possibility of meeting danger or of suffering harm or loss". Every human undertaking carries some risk, and managing those risks will determine whether the attempt succeeds or fails. On the other hand, risk management, often known as "uncertainty management," is a systematic approach a business takes to lessen the possibility that unforeseen events may occur to maximize profit. Since risk is inherently unpredictable, many authors have described it in their writings as uncertainty management. Risk management is applied across various industries, including the building, automotive, and pharmaceutical industries, as well as IT-related businesses. Each industry has developed its risk management standards, but the general ideas of the concept usually remain the same regardless of the sector.

The risk management process (RMP) is a widely recognized concept in the field of risk management. It comprises four primary steps, namely risk identification, assessment, action, and monitoring. In each of these steps, several methods and techniques facilitate handling the risks (Pinto, 2022). Many industries have become more proactive and aware of using analyses in projects. Similarly, risk management is now a topic that is frequently discussed in a variety of businesses. However, risk management is not frequently applied in the construction sector; frequently, this is due to a lack of understanding of the importance of risk management strategies.

Risk management is essential in all organizations but a more rigorous risk management practice is needed in organizations that are project-oriented. One of these kinds is the real estate industry. In Ethiopia, following the government's policy to encourage private investments, the real estate industry has seen drastic growth in recent years. This industry plays an important role in terms of its direct contribution to the economy; supplying housing for society, undertaking construction projects for commercial and other purposes, creating employment opportunities, its crosscutting effect in enhancing the development of other sectors through its backward and forward linkages as a consumer of raw and intermediate materials and its contribution to urbanization make this industry vital for the nation's economic growth (MoUHC 2014, cited by Hintsay 2016).

Construction projects significantly influence a nation's economic growth. Numerous participants are involved throughout all project phases. However, industry operators have faced difficulties and unpredictable circumstances. This is a frequent issue encountered by participants, leading to project schedule delays, significant cost increases, and poor-quality construction work.

When compared to other industries, it is generally a riskier one because of the intricate procedures, difficult working conditions, and high financial stakes. It also involves the collaboration of participants from different fields of study. There is no other industry that requires proper application of business practice much as the construction industry. This special behavior exposes the industry to various types of risks that cause deviation from the objective of the project, particularly the cost, time, and quality of a project. (Bahamid & Doh, 2017). A recent study by the Ethiopian Institute of Architecture of Addis Ababa University shows that the level of practice in terms of safety, risk (time, quality, cost, etc.), and time management in construction projects was found to be very low. The expected cost deviation from established

requirements or what was anticipated at the start of the project is between 21 and 40 percent, while the timetable slippage runs from 61 to 80 percent (Ayalew, Dakhli, & Lafhaj, 2016).

Just 28.6% of the general contractors surveyed in Haddush Hintsay's study on risk management practices in Ethiopia's construction industry reported using formal risk management (Hintsay 2016). In another study done by Lidya Erstu on the risk management practices in construction projects, in Addis Ababa Saving House Development Enterprise, it was found that effective risk identification and assessment practices were not being followed properly and as a result created a high financial, schedule and quality impacts. (Erstu, 2017). Another similar research done on the risk management practices in construction projects of specific companies in Ethiopia found that even though risk management is practiced, there is still a need for improvement starting from risk identification to strategic plan for risk responses. (Yirga, 2017). These studies imply that there are shortcomings in implementing risk management practices in the country which is impacting the objectives of the projects.

Although more construction organizations are beginning to use risk-management models and approaches, many are still not fully aware of the RMP. This runs counter to the industry's goal of increasing project control, cost and time efficiency, and efficiency. Risk is associated with any project regardless of the industry and thus risk management should be of interest to any project manager. Because each project is different, especially in the construction business, the risks vary from one to the next. Still, a lot of practitioners are unaware of how crucial it is to incorporate risk management into the project delivery process.

One type of housing construction that is being used to address Addis Ababa's severe housing shortage is real estate. In Ethiopia, it has developed into a constantly changing business. As major towns in the country continue experiencing rural-urban migration which is driving growth in demand for both residential and commercial property, real estate and property developers are striving to satisfy this demand. The majority of the initiatives in this sector are construction-related, making them exceedingly dangerous (Hintsay, 2016). Thus, risk management is essential to achieving a competitive advantage and sticking to the budget and schedule as well as making money from it.

There are different risks and challenges that real estates in Ethiopia face. This project work specifically focuses on Ayat Real Estate. It is a shareholder's company that was founded in 1997 G.C and is one of the pioneering Ethiopian companies in the construction sector. According to Ayat share company's five-year strategic plan (2013), it has completed and

continued to build over 5000 residential and apartment units, making it one of the industry's most experienced developers. Yet Ayat Real Estate still found itself entangled in a web of project headaches. Their ambition was plagued by time delays, quality issues, cost overruns, and scope creep. Proper risk management and proactive risk planning could have mitigated these problems.

There are many reasons why Risk Management matters. The problems plaguing Ayat Real Estate in their CCE mall apartment project illustrate the critical need for a high level of risk management in real estate development. A proactive approach would have involved identifying potential risks at the outset – permitting delays, labor shortages, and material cost fluctuations - and developing mitigation strategies.

This study is crucial to address this gap, focusing specifically on Ayat Real Estate, a prominent developer grappling with these challenges. By examining their risk management practices, this study aims to provide valuable insights into the effectiveness of existing approaches, identify areas for improvement, and ultimately contribute to a more robust risk management framework for the entire Ethiopian real estate industry.

It will also investigate the project risk management procedures and methods used in Ayat Real Estate CCE mall apartment projects. Key areas for improvement in risk management practices are recommended.

1.2. Background of Ayat Real Estate

One of the first companies in Ethiopia to enter the real estate market was Ayat Real Estate, a shareholder's company founded in 1997 G.C. The company is based in Addis Ababa, recognized for its significant contributions to the country's real estate sector. Established with a vision to redefine the standards of urban living and infrastructure development. The company was founded with a commitment to excellence, integrity, and innovation, principles that have guided its operations since its inception. It is renowned for its diverse portfolio of projects, including residential complexes, commercial buildings, mixed-use developments, and infrastructure projects.

At the moment, one of their largest projects is the CCE mall apartment. It is located around CMC. It has 62 units spread across 15 floors and is intended to provide spacious living options ranging from 2 to 4 bedrooms. Conveniently situated away from downtown but with easy access to major roads leading to Megenagna and other key areas. In this mixed-use building,

offices and other business conducting space will be available on four floors, from ground-street level up. This space was designed with a cutting-edge, inspirational, and supportive format to maximize buyers' convenience with shared restrooms, vehicle access, and ample parking.

Ayat Real Estate, a prominent company in the real estate sector, has demonstrated a modest approach to risk management. With a risk management department, they prioritize identifying, assessing, and mitigating potential risks across their operations. Their risk department employed various strategies, such as conducting thorough risk assessments, implementing effective controls, and regularly monitoring risk exposures.

1.3. Statement of the problem

In the current project management landscape, risk management may be the most crucial skill a project manager can have. Project managers must be proactive, show that they are willing to create backup plans, actively monitor the project, and be ready to move fast in the case of a major risk occurrence to effectively manage risk (Kerzner 2006).

The management of the risks associated with most undertakings has gained increased attention in the last several years. Meredith and Mantel (2009) state that the topic was initially covered in the 1987 (PMBOK) published by the Project Management Institute. According to theory, identifying risks and threats, quantifying them, and creating backup plans to address them are all part of the risk management process (Lewis 2011).

Real estate businesses have greater risks since they are project-oriented organizations, and they must handle them as effectively and quickly as possible. Real estate firms are expected to limit production delays, rising construction costs, and quality issues to maintain customer satisfaction and foster client confidence. This is because they are an organization trusted by their customers to deliver the product on agreed-upon time, cost, and quality standards. Unfortunately, most of the real estate companies appear to be on the far side from this expectation. The efficiency and effectiveness of the industry's performance are not as encouraging, with many projects experiencing delays, cost overruns, and quality issues. This was mostly attributed to several constraints and challenges; shortage of skilled manpower, inefficient project management, lack of technology transfer, absence of a conducive environment that enhances competition, and lack of efficient input supply chain were among the challenges constraining the growth of the industry (MoUCH 2014 cited by Haddush 2016).

The construction industry is highly risk-prone and is vulnerable to various technical, external, organizational, and project management risks. The construction industry has a poor history of managing these risks, particularly in underdeveloped nations like Ethiopia. Consequently, those employed in this sector experience a range of setbacks, including exceeding budgetary constraints, not meeting operational and quality standards, and unpredictably long project completion times (Dakhli, Lafhaj, and Ayalew, 2016). To reduce these losses, it is necessary to create efficient risk management systems for the construction sector.

From empirical evidence, Yimam (2011) found out that Ethiopian construction projects, risk management maturity level, is very low. The very low level of reported maturity for risk management and the low importance given to it (risk management is ranked to be less important than all the other knowledge areas except safety management and communication management). This may indicate the low level of awareness about the importance of risk management in the construction industry of the country. As developing countries are characterized by very volatile and uncertain environments, management of risk should have been a logical priority (Yimam, 2011).

The mentioned instance demonstrated that risk management within the construction sector in Ethiopia is still in its infancy, primarily addressing only a limited scope of the project management process. For example, Addis (2014) explored "Construction contract risk management practices in Ethiopian building construction projects," Seleshi (2018) examined "Project Risk Management Practices of Selected Chinese Building Contractors in Ethiopia," and Yimam (2011) investigated "Project Management Maturity in The Construction Industry of Developing Countries (the Case of Ethiopian Contractors)," among other relevant studies.

In Ethiopia, considering the significance of risk management, some thesis papers are conducted. Tsion (2015) studied risk management practices of Ethiopian Commercial Banks and found that an appropriate environment has been established for managing risk, possible risks are identified, prioritized, and planned for in advance, and there are tools, techniques, guidelines, and procedures to manage risks and that there is awareness about risk management among the Banks' staffs. However, risk management studies conducted on projects tell a different story. (Haddush, 2016) Found that formal risk management is barely implemented and practiced in projects, specifically in construction projects. The absence of comprehensive identification of the various risks and evaluation of their respective impacts on project

objectives is causing a delay and cost overruns. Moreover, they recommended advanced risk planning and preparations to properly and efficiently respond to when such risks occur.

Researches has shed light on the risk management techniques used by various enterprises and businesses in Ethiopia; however, most of these studies have concentrated on the drawbacks of risks and how they can negatively impact corporate objectives. In actuality, though, risks can result in favorable or unfavorable consequences should they come to pass. Furthermore, the bulk of research on risk management has been focused on the banking business, with little research being done on risk management techniques used in building projects, especially in the real estate sector. Overall, the understanding and implementation of risk management practices in the Ethiopian construction sector are lacking due to a lack of awareness about their importance. Consequently, risks in building construction projects often go unmanaged due to insufficient knowledge, posing threats to project objectives. This likely explains why many building construction projects experience significant deviations from the original plans, especially concerning cost, time, and quality.

Despite its experience and commitment to quality, Ayat Real Estate has encountered challenges in its CCE mall apartment project, including delays, cost overruns, and quality issues. These challenges, coupled with the lack of a comprehensive and effective risk management framework in the company's construction projects, pose a significant challenge to Ayat's ability to achieve project success and maintain its competitive edge in the Ethiopian real estate market, characterized by complex and dynamic conditions. This research aims to assess the existing risk management practices at Ayat Real Estate to identify areas for improvement and provide actionable recommendations to enhance the company's risk management strategies and ultimately contribute to the overall success of its projects.

Therefore, to effectively complete a project, it's critical to be better aware of risks and how to manage them. A deeper comprehension of risks is required, their identification, understanding, and perception, and the assessment and management procedures used in general and real estate projects. Moreover, projects need to identify positive risks and opportunities, in addition to negative risks and threats. Accordingly, this research aims to determine whether there is a difference between the theoretical risk management process and the risk management procedures that are now in place for the CCE mall apartment construction projects owned by Ayat Real Estate.

1.4. Research questions

The basic problem of any company is to complete the project within the specified time, cost, scope, and quality or with the initial agreement to satisfy the customers by completing the building project successfully. The following research questions have been developed to address the purpose and objectives of the study by focusing on the Ayat Real Estate construction projects that the study will cover. Now the basic questions are:

1. What is the level of risk and risk management awareness and perception among Ayat Real Estate employees working on the CCE mall apartment project?
2. What methods does Ayat Real Estate employ to plan, identify, analyze, respond, monitor, and evaluate risks in the CCE mall apartment project?
3. What are the specific benefits of the risk management plan for the CCE mall apartment project?
4. What are some of the difficulties Ayat Real Estate encounters when managing risks in the CCE mall apartment project?

1.5. Research objectives

The objectives of the study are twofold with one main objective and some specific objectives:

1.5.1. General objective

- The general objective of the study is to assess the project risk management practices in construction projects at Ayat Real Estate, focusing on the CCE Mall Apartment Project

1.5.2. Specific objective

- To determine the level of risk and risk management awareness and perception among Ayat Real Estate employees involved in the CCE Mall Apartment Project.
- To assess the practice of project risk management in Ayat Real Estate related to planning, identifying, analyzing, responding, and monitoring risks.
- To investigate the specific benefits of a risk management plan for the CCE mall apartment project in Ayat Real Estate.
- To identify the difficulties faced by Ayat Real Estate in managing risks on the CCE mall apartment project.

1.6. Significance of the study

This research project particularly helps to look into challenges encountered while implementing project risk management practices in the case of Ayat's Real Estate. This study will be significant to professionals, decision-makers, policy designers, and practitioners to look for the best policies, methods, and processes for doing and managing projects. This study aims to point out these difficulties and thus improve the project risk management practice to benefit from the findings.

Additionally, it gives a general insight to the academic & professional society about the different aspects of risk management and how it is being practiced in the real estate industry. It will also serve as a reference for further studies. Finally, it will also contribute to project management knowledge in that the research follows a different approach in categorizing the challenges with project management knowledge areas that can be used as a baseline for further study. It is assumed that this research output contributes to identifying risk management practices of Ayat Real Estate. As project management continues to evolve and expand its knowledge base, this study aims to enhance the existing understanding by introducing new concepts, specifically focusing on the practices employed by construction companies. While the research centers on building projects, its findings may have relevance for professionals involved in various other project types.

Overall, this study is expected to make a significant contribution to the understanding and improvement of risk management practices in the Ethiopian construction sector, benefiting Ayat Real Estate, other construction companies, policymakers, and the field of academia.

1.7. Scope of the study

This study is conducted on project risk management practice only on a building construction development project called CCE Mall apartment of Ayat Real Estate located in Addis Ababa around CMC Michael. Hence this study is delimited to Ayat Real Estate projects on the subject of the practice of risk management; which may restrict the generalization of the findings to all real estate projects.

Only one of the ten project management knowledge areas—risk management—will be the subject of this study, which will gather data at a single point in time rather than analyzing trends over time. The study specifically looks into how risk management is applied in Ayat Real Estate.

1.8. Limitations of the study

Some of the limiting factors that affected the study are, the scope of the study as this project only focuses on a single company, and the availability of information on the topic as the record-keeping practices in our country weren't modernized and well organized.

1.9. Organization of the study

The research is organized into five sections as shown below:

The introduction serves as the initial glimpse into the research for the reader. It encompasses the study's background, problem statement, research question, objectives, significance, and scope and limitations. Additionally, it defines key terms used in the study. The goal of the introduction is to elucidate the research study's purpose and establish a coherent path.

The second chapter delves into both theoretical and practical aspects of risk management within construction. This chapter aims to provide the reader with a sufficient understanding of the concepts and therefore, give a profound basis to the study as a whole.

Chapter three delves into the research design and methodology. It will outline the research design and approach utilized in this study, as well as the data sources, population, sample size, and sampling technique. It will also detail the development and utilization of data collection instruments, the procedures for data collection, methods for data analysis, reliability, validity and ethical considerations.

The fourth section of the report delves into the analysis of data and a thorough examination of the research discoveries. The collected data through questionnaires were analyzed and discussed. Within this segment, the primary findings of the investigation will be outlined, accompanied by an assessment of their deviation from the findings of other scholarly studies referenced in the literature review.

The concluding section encompasses a summary of the research findings, conclusions, and recommendations for future studies derived from these findings. It covers the key insights gathered, concludes, and suggests areas requiring additional investigation.

1.10. Definition of key terms

Project: A project is a temporary endeavor undertaken to create a unique product, service, or result (Lewis, 2011).

Project management: is a set activity that utilizes organizational structures and resources for the beneficial outcome of the project (Munns & Bjeirmi, 1996).

Risk: a positive and/or negative deviation from the expected which can affect project objectives is the implication of future uncertainty about deviation from expected earnings or expected outcome (ISO/Guide 73, 2009).

Risk Management: is an integral part of understanding the advantages and disadvantages of risks that contribute to the success and failure of a project objective respectively (Spikin, 2013).

PMBOK (Project Management Body of Knowledge): is a guide that explains the processes and the knowledge areas of project management.

PMI (Project Management Institute): is the professional association for project managers that promotes project management as a profession, thereby raising the perceived status of project managers, and it has developed a certification process that confers on those who meet the requirements for the designation of Project Management Professional (Lewis 2011).

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

This chapter presents the findings from different reviewed literature about risk management practices for construction companies. It includes theoretical and empirical reviews. The theoretical review helps to understand the various definitions and importance of the main concepts and models in the topic of study. Variables are identified and the conceptual framework of the study is also included. The empirical review part presents previous findings regarding risk management practices from different published sources and adds the researcher's point of view on it.

2.2. Theoretical literature review

This chapter focuses on examining the literature of various scholars and authors, with a specific focus on project risk management within real estate construction projects. It delves into theoretical concepts related to projects, project management, and the project risk management process, which includes risk identification, assessment, response strategies, and monitoring, as discussed by several researchers. Additionally, it explores empirical literature, highlighting research findings and methodologies used, particularly within the context of the construction industry and risk management in Ethiopia. The chapter also considers a conceptual framework. The thorough review of related literature aims to fulfill the research objectives.

2.2.1. Introduction to Project Management

What is a project?

Various authors have provided numerous definitions for the term "project" due to its multidisciplinary nature, resulting in diverse interpretations from different perspectives and orientations. Engineers, architects, managers, and others have formulated their definitions based on their professional experiences and areas of expertise. The definition they offer is influenced by their specific field of study and individual viewpoints. However, for a more comprehensive grasp of the concept, it is advisable to consult a range of definitions. Generally, a project can be understood as an endeavor aimed at effecting change to accomplish specific objectives within a designated timeframe, within a defined context, and with an allocated budget.

A project is described by PMI (2017) as a brief undertaking starting with the intention of producing a special good, service, or outcome. The transient character of projects suggests that they have a clear start and conclusion. Being temporary does not always imply that the project will end quickly. It alludes to the duration and level of engagement of the project. Most projects are started to produce a long-term result, hence temporarily usually does not apply to the good, service, or consequence produced by the project. A project is a temporary effort aimed at achieving a specific goal. It involves a series of tasks that need to be completed within a defined timeframe and budget.

Project Management

In the PMI (2017), the Project Management Institute (PMI) formally defines project management as "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements".:

Wysocki (2014) defined project management as "an organized common-sense approach that utilizes the appropriate client involvement to meet sponsor needs and deliver expected incremental business value". Here, business value is the responsibility of the client through their requirements statements. The project manager is responsible for meeting those requirements. Meeting requirements is the cause and incremental business value is the effect.

Projects are distinct, intricate, and sequentially linked activities with a single, clear objective that needs to be accomplished within a given timeframe, budget, and specification while utilizing limited resources (Wysocki, 2014). In contrast, project management is defined by the PMBOK Guide as a set of five process groups, including project initiation, planning, execution, monitoring, controlling, and closure.

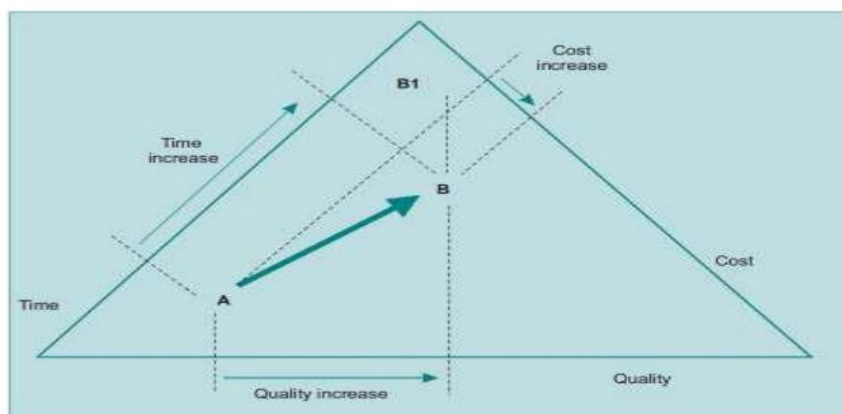


Figure 1: Project Management time–cost–quality continuum (source: PM context Module, AASC)

Most authors agree that project management is about achieving time, cost, and quality targets, within the context of overall strategic and tactical client requirements, by using project resources. Risk management is one of the ten knowledge areas in project management, as defined by the Project Management Institute (PMI)

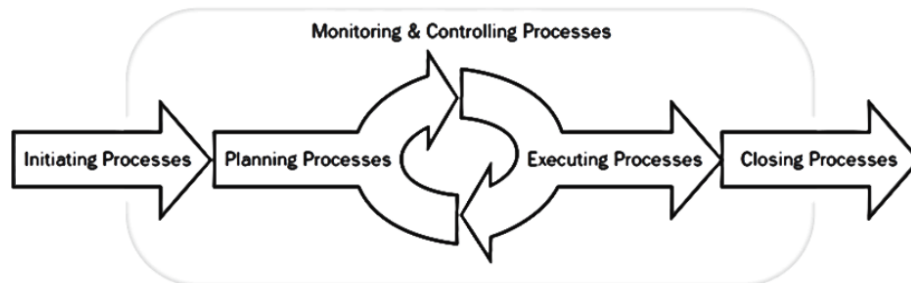


Figure 2 The five process groups of Project Management (Source: AASC Module)

2.2.2. Risk Management

What is Risk?

A risk is an unpredictable event or circumstance that, if it materializes, could have a positive or negative impact on a project's aim. It is one of the nine PM knowledge domains (PMI, 2017). A risk is an unforeseen circumstance or incident that, if it materializes, will affect the project's ability to meet its goals. Notably, risk can be better defined as an uncertain effect on project performance in this context as opposed to being the cause of a (uncertain) effect on project performance (APM, 2012).

Risk is commonly understood as the potential for loss or injury (Hillson & Murray-Webster, 2017), encompassing the probability and consequence of not achieving defined project goals (PMI, 2017). It refers to uncertain future events that could impact the attainment of project objectives (APM, 2012) and is defined as the likelihood of something happening that will affect objectives (International Organization for Standardization, 2009)

Basics of Risk Management

A project is a temporary, unique, and time-limited piece of work, in which multiple activities typically must be carried out to achieve specified objectives (PMI, 2017). To carry out those activities, multiple stakeholders from different organizations based in different locations typically work together. Every project, whether it is simple or complex, small or large, faces different uncertainties throughout its course. This uncertainty is so crucial in determining a project's likelihood of success or failure and is referred to as project risk. Risk is mainly related

to negative events that occur during a project, whereas the Association for Project Management (APM) and the Project Management Institute (PMI) describe risk as sometimes having positive and sometimes negative impacts on a project. Project risk can be defined as an uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective, such as time, cost, scope, or quality (PMI, 2017)

According to APM (2012), a project's risk is an unforeseen event or collection of circumstances that, if they materialize, could have an impact on the accomplishment of one or more goals. From these two definitions, we can say that project risk is an uncertain phenomenon that can influence the outcome of a project. Thus, to ensure that project risk induces minimal negative outcomes, project risk management is essential, especially for large or complex projects. It has been established in numerous earlier studies that poor risk management in failing projects is strongly linked to project failure. Risk Management has an enormous impact on project success and failure. Without a proper Risk Management plan in place, there is a high probability for any project, especially large and complex projects to encounter many uncertainties and ultimately failure. The main goal of project Risk Management is to identify any associated risks and take preventative and corrective measures to prevent or minimize negative impacts. Project risk can evolve in many different forms, according to the specific sector.

Since risk is inherently unpredictable, many authors have defined risk management in the literature as uncertainty management. The two most widely accepted definitions of risk management are those provided by APM and PMI: the methodical procedure for locating, evaluating, and handling project risk. It involves limiting the likelihood and effects of unfavorable occurrences on project objectives and increasing the likelihood and effects of favorable events (PMI, 2017). a procedure wherein choices are made regarding the acceptance of recognized or evaluated dangers and/or the execution of measures to lessen the effects or likelihood of occurrence (APM, 2012).

Risk Management Process

There are many process models of Risk Management described in the literature and there is a strong consensus regarding Risk Management approach. Among them, the most commonly used and accepted process model is given by (PMBOK). Dealing with risk is the act of practicing risk management. It involves anticipating hazards, recognizing them, evaluating

them, creating plans for handling them, and keeping an eye on and managing them to see how they've evolved.

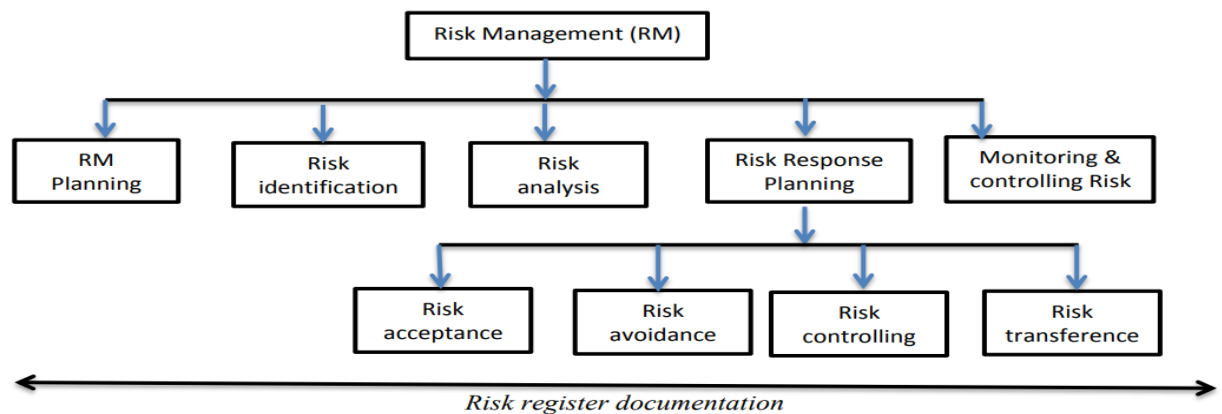


Figure 3: Overview of the risk management process (Source, Richardson, 2015)

A. Planning risk management

According to (PMI, 2017), plan risk management is the process of defining how to conduct risk management activities for a project. This approach's main advantage is that it guarantees that the scope, nature, and visibility of risk management correspond to the risks and the project's significance to the company. To guarantee that the risk management process is supported and carried out successfully throughout the project life cycle, it is essential to engage with all stakeholders and get their consent and support through the risk management strategy. The inputs, tools techniques, and outputs of this process are depicted in Figure 4.

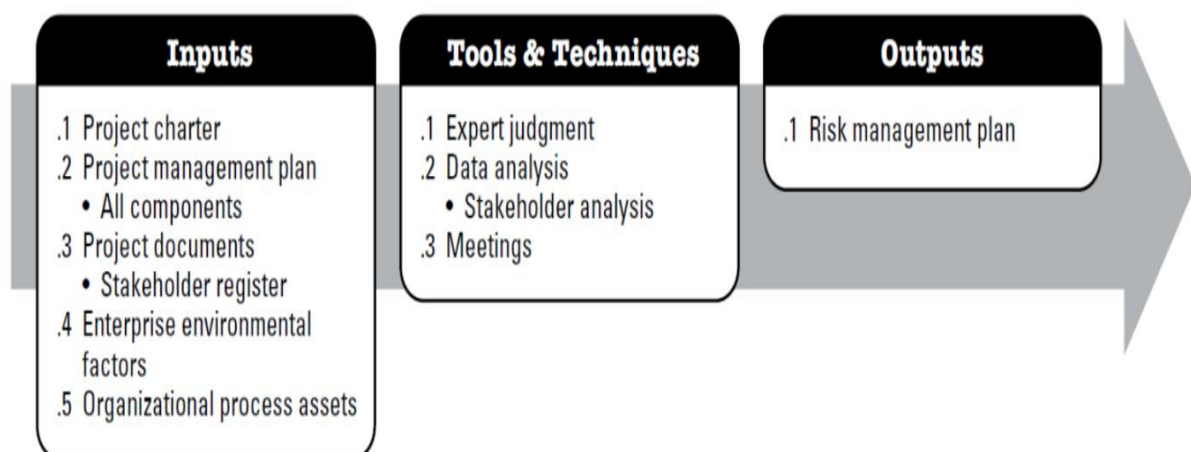


Figure 4: Plan risk management: Inputs, Tools & Techniques, and Outputs (Source, PMI, 2017)

B. Risk identification

According to (PMI, 2017), Risk identification is the process of determining which risks may affect the project and documenting their characteristics. The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events. The inputs, tools techniques, and outputs of this process are depicted in Figure 5.

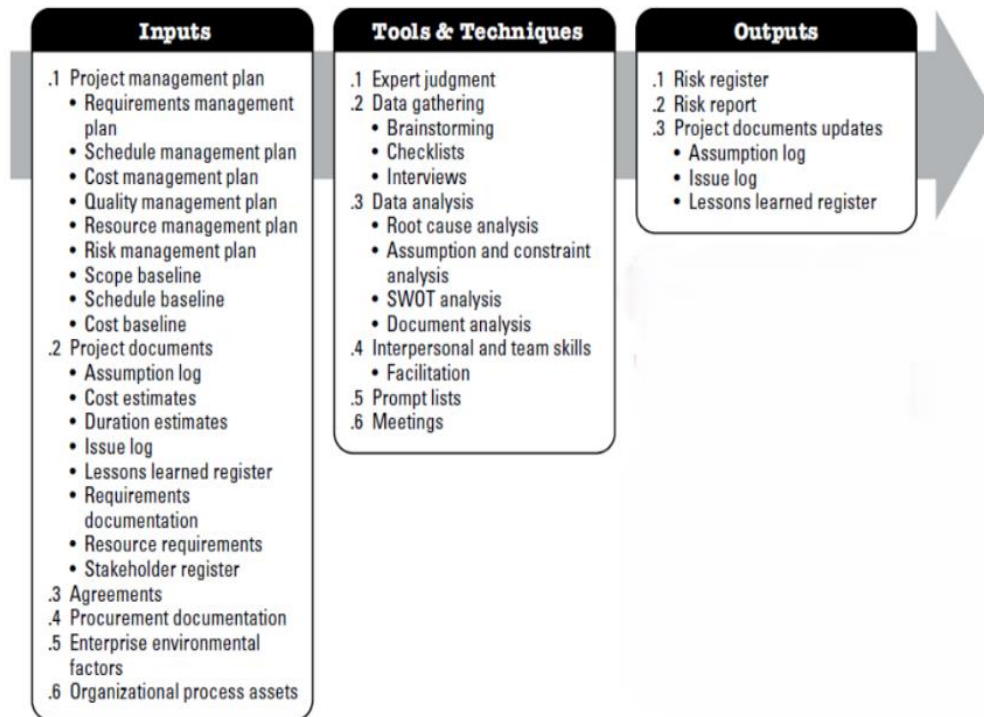


Figure 5 : Identify risk: Inputs, Tools& Techniques, and Outputs (Source, PMI, 2017)

C. Risk analysis

The process of examining each identified risk to estimate the probability and predict the impact on the project. It includes both qualitative risk analysis and quantitative risk analysis.

- **Qualitative Risk Analysis:** the process of determining a risk's potential impact and likelihood. Risks are ranked in this procedure based on how they might affect the project's goals. It's one method of figuring out how critical it is to handle particular risks and direct risk responses (PMI, 2017).

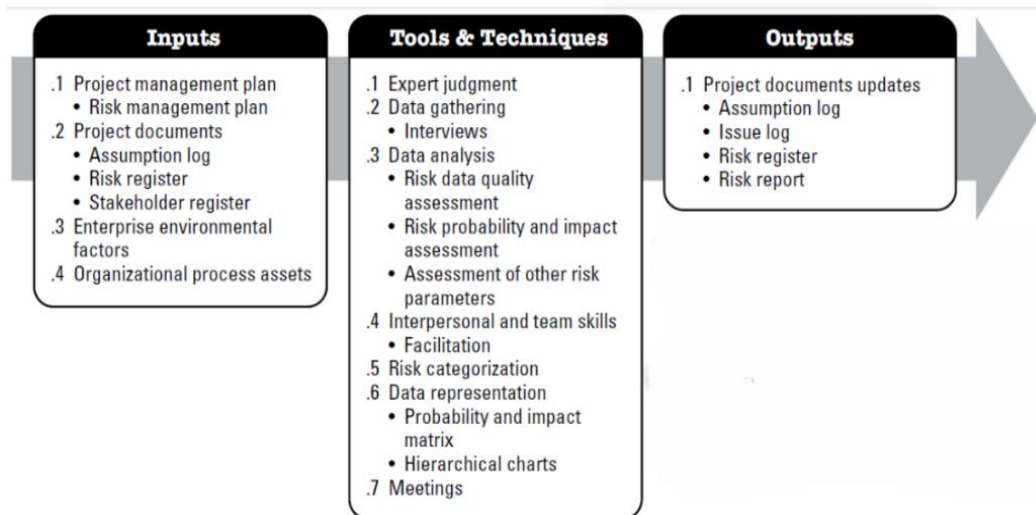


Figure 6: Perform Qualitative Risk Analysis: Inputs, Tools & Techniques, and Outputs (Source, PMI, 2017)

- **Quantitative Risk Analysis:** This seeks to quantitatively assess the likelihood of each risk, its impact on project goals, and the total amount of project risk. (PMI, 2017).

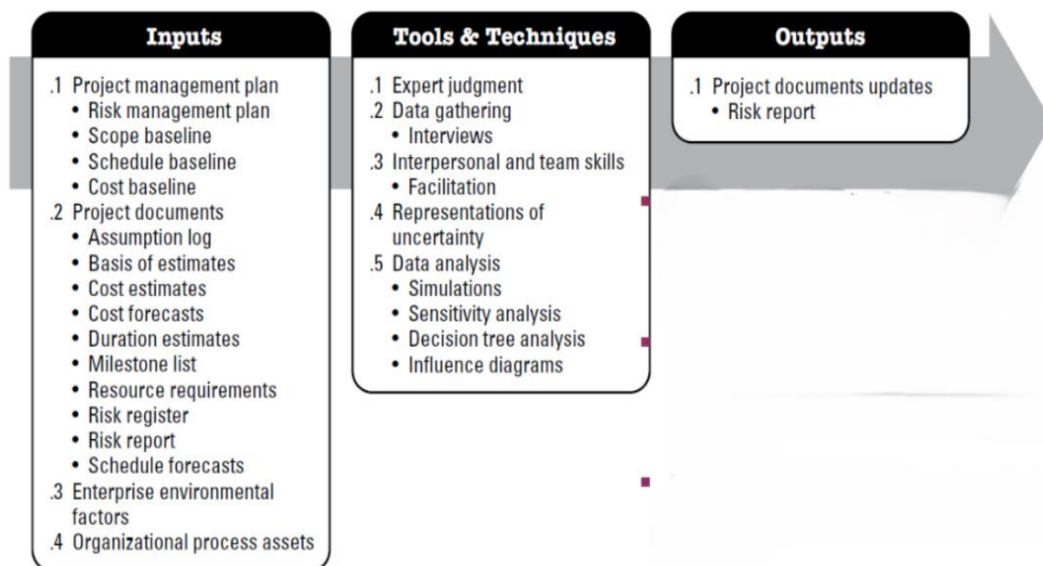


Figure 7: Perform Quantitative Risk Analysis: Inputs, Tools & Techniques, and Outputs (Source, PMI, 2017)

D. Risk response

According to (PMI 2017), the procedure that determines, assesses, decides upon, and puts into practice one or more solutions to set risk at levels that are acceptable in light of the goals and limits of the program. This covers the precise details of what has to be done, when it needs to be done, who is in charge, and the budget and timeline involved. A risk or opportunity response

strategy is composed of an option and implementation approach. Response options for risks include acceptance, avoidance, mitigation (also known as control), and transfer.

- **Risk Acceptance (i.e., retention):** In some instances, a stakeholder organization can reward itself for retaining a risk. This presupposes that the risk identification and analysis processes of risk management have been implemented, at least to some extent. Retaining risks without mitigating them presumes that the decision is an informed one and based upon analysis which indicates that any reduction treatment has a negative cost/benefit ratio
- **Risk Avoidance:** Avoiding risk means deliberately taking another course of action so that it cannot arise in the new circumstances for that project. Note that this is not the same as eliminating risk. Risk elimination is rarely possible: if it becomes necessary to revert to the former circumstances the risk will return. The ultimate form of risk avoidance is not to proceed with the project at all. However, this extreme is seldom adopted as a response to one project risk factor in isolation.
- **Risk Control (e.g., mitigation):** No risk should be avoided, transferred, or retained without first checking to see if it is possible to reduce it and then retain the residual risk. For anyone with a professional interest in risk management, reducing risk is probably the most absorbing area of involvement.
- **Risk Transfer:** In electing to transfer risk, a project organization is seeking to shift the burden of a particular risk to another stakeholder. This is a common response in project situations where stakeholder supply chains or networks are easily distinguished, as attempts will be made to transfer risks progressively along the supply chain or to the more distant extremities of the network.
- **Combination responses to risk:** Combinations of retention, reduction, and transfer responses to risk are possible. Since risk avoidance aims to change the circumstances through which a particular risk arises, this response cannot be used in combination with others (Kerzner, 2009).

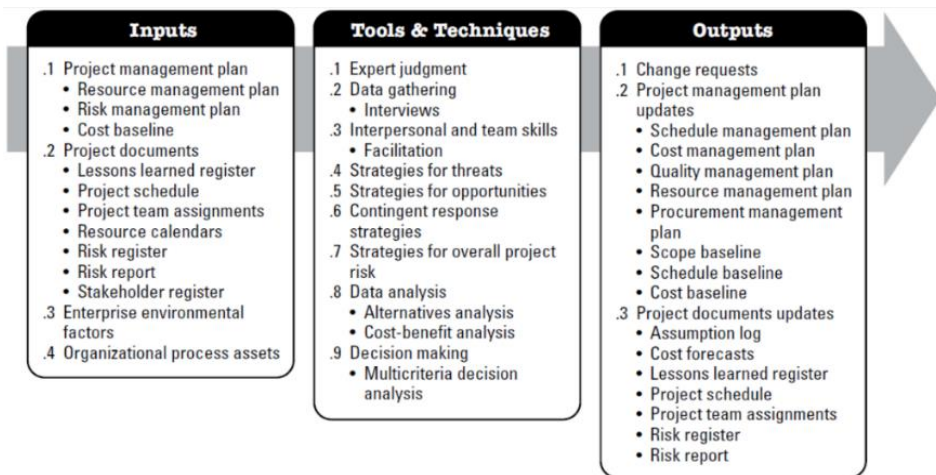


Figure 8 : Plan Risk Response: Inputs, Tools & Techniques, and Outputs (Source, PMI, 2017)

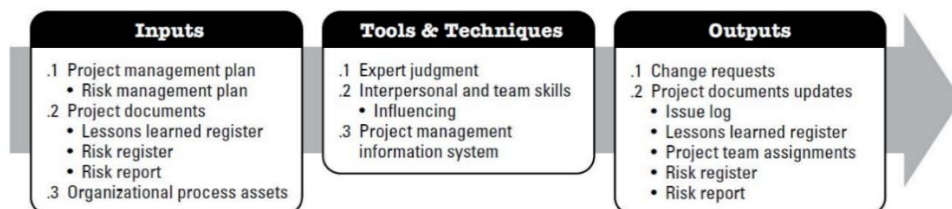


Figure 9: Implement Risk Response: Input, Tools & Techniques, and Outputs (Source, PMI, 2017)

E. Risk Monitoring and Controlling

According to (PMI, 2017), Control Risks is the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project. The key benefit of this process is that it improves the efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses. The inputs, tools techniques, and outputs of this process are depicted in Figure 10.

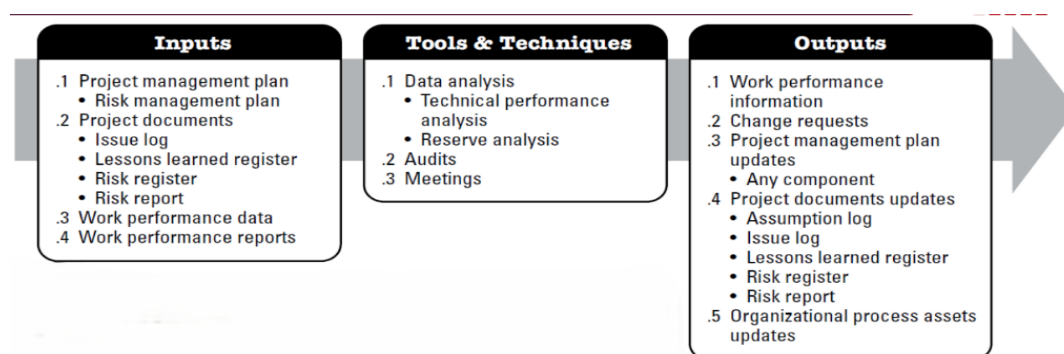


Figure 10: Monitor risk: Inputs, Tools & Techniques, and Outputs (Source: PMI, 2017)

Risk and Project Management Process

Risk is inherently tied to the timing and life cycle of the project because risk probabilities and impacts change over that life cycle. A minor, low-ranked risk at the beginning of the initiation stage can become a highly ranked and severe impact risk later in the project life cycle if not attended to. On the other hand, risks too early attended to can create needless effort and cost before their real implications for project success are fully known. Thus, the effective project manager finds the appropriate "window" for risk response. That window is the decision point, or range, in the project where the risk contingency must be implemented to avoid schedule and cost impacts (Barkley 2004). The following procedures are used to complete a project: initiating, planning, executing, controlling, and closing (PMI, 2017). Iterative processes are a common feature in project management procedures. The outputs that each process group generates bind them together since their outputs frequently serve as inputs for other process groups. Furthermore, these process groups are overlapping activities that take place at different intensities during each project phase rather than being discrete, one-time events. The interactions between the process groups also span phases, so that the conclusion of one phase contributes to the start of the next. The (PMI, 2017) has established five project processes:

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	

Figure 11: Risk and project management process (Source, PMI, 2017)

1. Initiating

Initiating refers to doing whatever must be done to authorize a project. The initiation stage is where the overall project risk is conceived, dimensioned, and described to develop an "order of magnitude" grasp of project risk. The kind of thinking and conversation that ensues in this phase addresses the potential of a new product or initiative, the prospect of customer and market

demand, and the competitive and risk issues inherent in an endeavor still in its initial conceptual stage. At this point, the project manager and the planner are dealing with broad, "macro" issues.

2. Planning

Project planning refers to identifying all the work that must be done; and developing policies, procedures, and other documentation that define the project. Project planning and risk planning are related in the sense that project planning documents and deliverables incorporate risk and risk contingencies. But risk planning has taken on another slightly different meaning in the new PMI PMBOK document. Risk planning is seen by PMI as preparing the organization and its support systems for risk management. This emphasis gives special attention to the need to build the cultural underpinnings and support systems for risk management before top management can expect its project teams to address risk (Barkley 2004).

3. Executing

Project execution is the process of applying labour and materials to develop the product (in this case, the product is a general term for whatever the project produces—whether an item, a service, or some other result) (PMI, 2017). The more the company can move toward a standard work breakdown structure, the easier it is to inculcate risk management practice into the scheduling and execution processes. Standard WBS formats will provide for risk contingencies and risk-based scheduling using MS Project PERT analysis or other software tools (Barkley 2004).

4. Monitoring & Controlling

Monitoring project progress about the plan and taking appropriate steps to maintain project momentum constitute project control. Project control involves tracking recognized risks through risk monitoring and management, keeping an eye on lingering hazards and spotting new ones, making sure risk strategies are carried out, and assessing how well they reduce risk (PMI, 2017).

5. Closing

Closing is a formal acceptance of the product and documentation of activities throughout the life of the project. A lesson-learned project review should be conducted soon after project closeout and should include all project team members, a member of top management, and stakeholder representatives. The focus should be on identifying what went right and what went

wrong and dimensioning what went wrong in terms of unanticipated or unmitigated risks and uncertainty. This can be accomplished by scheduling and facilitating the meeting around key risk issues or topics that help to capture the risks inherent in the project (Barkley 2004).

Perceptions of Risk and Risk Attitudes

The essence of risk management is the way the organization treats risk and the way your team thinks about the project. The challenge for the organization is teaching and training project leaders and team members to think in terms of risk and to internalize the risk management process into their daily work (Barkley 2004).

Risk decisions are influenced by how risk is perceived, and how it's processed by individuals, groups, and organizations. Given the same information on risk exposure for a situation, different people will likely respond differently. What is an acceptable risk to one may not be acceptable to another as they hold different views and have different understandings of a particular risk's components, sources, probabilities, consequences, and preferred actions. The explanation partly lies in differences in risk perception and risk attitudes (Hintsay, 2016).

Perception of risk and risk attitudes have critical roles in risk decisions starting from defining what risk is to identifying risks and the sources of risks, the analysis and evaluation of risks, and hence the selection of appropriate methods to respond to risks and the need for monitoring and review of risks and the overall communication and consultation needed on risks and risk management (Hintsay, 2016). Training and development programs that address risk identification, assessment, and response can help build professional competence and better risk awareness in handling risk issues in real projects. The project team must develop an understanding of the major risks that affect the achievement of project objectives so that negative risk impacts can be minimized.

The Role of Communication in Risk Management

Communication is essential to effective risk management, facilitating information sharing, coordination, and collaboration among stakeholders. Effective communication helps ensure that all parties involved in a project clearly understand potential risks, their impact, and the planned response strategies (Cooper, Grey, Raymond, & Walker, 2005).

Key roles of communication in risk management include:

Risk Identification: Open and transparent communication helps to identify risks more comprehensively by ensuring that all relevant stakeholders share their knowledge and perspectives (Barkley, 2004).

Risk Analysis and Planning: Effective communication enables stakeholders to understand risks and their potential consequences, facilitating more accurate risk analysis and planning (Hintsay, 2016).

Risk Response Planning: Clear and concise communication is vital for developing and implementing coordinated risk response strategies, ensuring that all parties are aligned and responsible for their roles (PMI, 2017).

Risk Monitoring and Evaluation: Communication is essential for tracking the effectiveness of implemented risk response strategies, identifying emerging risks, and making adjustments to plans as needed (Barkley, 2004).

Building a Risk-Aware Culture: Effective communication fosters a culture of risk awareness within an organization, encouraging employees to share information and proactively identify and address risks (Hillson & Murray-Webster, 2017).

Overall, strong communication practices are vital for successful risk management. By facilitating information sharing, promoting collaboration, and fostering a shared understanding of risks and response strategies, effective communication can significantly enhance the likelihood of project success.

2.2.3. Risks in Construction Projects

(Odeyinka, 2004) characterized risk within construction as a variable inherent to the construction process, its fluctuations leading to uncertainty regarding the eventual cost, duration, and quality of the project. From this perspective, risk was construed both as a psychological construct, relevant in terms of human perceptions and responses, and as an objective occurrence that may or may not be acknowledged through human experiences. Common repercussions of project risks encompassed cost overruns, delays, compromised quality, and contractual disputes among involved parties.

Moreover, risks in construction projects stem from various origins, including environmental/political factors, health and safety hazards, market conditions, and

technical/functional challenges. (Odeyinka, 2004) contended that these recognized risk sources within the construction industry continually confront diverse scenarios laden with numerous unknowns, often unfavorable and unpredictable elements such as timing issues, project task delays, technological complexities, human-related concerns, financial constraints, managerial obstacles, and political considerations.

(Odeyinka, 2004) delineated three primary types of construction risks: financial risks, wherein projects exceed budgetary constraints and jeopardize the financial stability of the entity; time-related risks; and design-related risks. It is widely acknowledged that during the execution of building projects, the final contract sum frequently deviates from the initially budgeted amount. Such deviations can stem from either a decrease or an increase in the original contract sum, sometimes attributed to the intricate nature of projects and the timeframes required for their completion.

Categories of Risks in Construction

In the construction industry, there are numerous risk factors, as the study has previously attempted to demonstrate above. The study looks more closely at the top six risk categories that should always be taken into account when evaluating risk management techniques to define construction industry risk in more detail:

- 1. Risks in the project management process** - it is a risk associated with project management and the smooth progression of the project. These risks stem from inefficiencies or flaws in the planning, execution, and control of the project itself. To name a few examples poor communication among stakeholders, lack of clear project scope definition, inadequate resource allocation, unrealistic deadlines, ineffective change management processes, and Insufficient project monitoring and control. (Odeyinka, 2006).
- 2. Financial risk** - budget overruns are one of the most serious dangers to a project's success. However, it is critical for the construction management team to accurately identify financial risks before the commencement of the project (Odeyinka, 2006). Simply put local tax systems, inflation, and currency rates are some potential risk factors when we refer to financial risks.
- 3. Legal risks** - contracts can lead to severe disagreements during the construction phase. As a result, you must devote additional time and effort to ensuring that all contractual

agreements are properly handled. Each party's responsibilities and rights should be clearly defined, and an unambiguous solution for each possible event should be anticipated. In that aspect, a competent legal team is always a necessary addition as it can decrease significantly any legal risks in your project (Odeyinka, 2004).

4. **Safety risks** - accidents are one of the industry's most vexing problems. Working on-site necessitates a high level of concentration and attention to detail. It doesn't take much to realize that the project management team should always do their best to make the field a safe and accident-free environment (Odeyinka, 2006).
5. **Environmental risks** - natural disasters (earthquakes, floods, lightning, and so on) can pose a threat to the smooth progress of your project in some situations. As a result, an assessment of the environmental conditions in the area where your project is being carried out is considered a "must." As a result, the management team can take all essential precautions to protect both the field workers and the progress of the project (Odeyinka, 2006)
6. **Technical & design risks** - in risk management, technical risks (also known as technological risks or innovation risks) refer to the type of business risk. These are the dangers that come with using new or untested technologies, technical equipment, or industrial methods. There are also risks related to the design, engineering, and construction methods employed in the project.

2.2.4. Overview of the Real Estate Industry in Ethiopia

The real estate industry in Ethiopia is highly lucrative and in high demand, particularly concentrated in Addis Ababa, one of Africa's fastest-growing cities. This makes the city a prime location for real estate investment, especially in luxury housing. Ethiopia has experienced notable economic growth since 2005, averaging 10.8% annually, placing it among the world's fastest-growing economies. The real estate sector has played a significant role in this growth, with its expansion being crucial to sustaining double-digit economic growth in recent years (African Economic Outlook, 2016).

Real estate encompasses land, buildings, and natural resources, constituting property ownership and interests. This sector has witnessed substantial growth within Ethiopia's economy, evolving since the 1980s to its current state (Seid, 2009). Data from the Ethiopian Investment Commission indicates a substantial increase in real estate investment since 2015, with around 117 companies obtaining licenses for 56 different projects. The majority of these

ventures are either wholly Ethiopian-owned or in joint ventures with foreign investors, with some remaining under full foreign ownership (Seid, 2019).

The main hub of real estate activity in Ethiopia is undoubtedly Addis Ababa. Out of the current 56 real estate projects, 43 are situated in Addis Ababa, driven by the consistently increasing demand for housing in the city. The transformation of the real estate sector in Addis Ababa is a visible outcome of Ethiopia's recent economic growth. From 1975 to 1991, the Socialist government controlled the real estate supply, implementing a cooperative housing delivery system and nationalizing urban lands and housing. However, since the overthrow of the socialist regime in 1991, the government has adopted a more market-oriented approach, allowing the private sector to play a larger role in real estate development. This liberalization, coupled with economic growth, favorable demographics, and political stability, has fostered the establishment and expansion of various real estate developers in the country (Zerayehu & Kagnew, 2015).

Ethiopia's urban population has been growing at an average rate of 3.8% per year since 2005 and is projected to triple from 15.2 million in 2012 to 42.3 million by 2037 (African Economic Outlook, 2016). This rapid urbanization presents a significant development challenge that the government, despite its efforts, cannot address alone. While residential real estate often caters to middle- and higher-income families due to affordability issues for low-income groups, there is a pressing need for real estate developers to actively contribute to meeting the high demand for housing and commercial buildings.

Real estate developers like Ayat Real Estate have pioneered large-scale developments in Ethiopia, and now, over ten companies operate in Addis Ababa. Major developers for residential and commercial properties include Ayat Real Estate, Sunshine Real Estate, Hassenias Real Estate, and others (Access Capital Research, 2010). These developers offer a range of properties, from luxury homes to more moderately priced ones.

Efficient operation of a real estate market can yield significant social and economic benefits for a country. However, challenges such as project risks must be addressed. Real estate projects are often unique, complex, and temporary, which can lead to risks such as budget overruns or delays. Effective risk management is crucial, especially for projects in Addis Ababa, where this study aims to assess risk management practices among three real estate organizations.

The importance of risk management in real estate projects

Hintsay (2016) suggests that implementing a structured risk management process yields both immediate and long-term advantages. Each aspect of risk management, from identifying and evaluating risks to devising mitigation strategies, offers its own merits. The systemic approach to risk management generates numerous direct and indirect benefits for organizations, which may not be easily quantifiable. The information gathered during risk identification, analysis, and response decisions enables informed decision-making regarding strategic and operational choices for real estate developers, facilitating the efficient allocation of limited resources by balancing the risks and rewards of various strategies (Barkley, 2004). According to the Institute of Risk Management (2002), risk management safeguards and enhances the value of projects and their stakeholders by supporting project objectives through a framework that fosters consistent and controlled future activities and improves decision-making, planning, and prioritization through a thorough and structured understanding of business activity, volatility, project opportunities/threats, and enhances operational efficiency. Generally, in real estate projects, risk management is crucial as it enhances the likelihood of achieving project objectives (such as delivering the product within the agreed-upon time, cost, and quality standards), enables informed project decisions, improves communication among project stakeholders, enhances customer loyalty and confidence, and promotes resource efficiency and effectiveness.

2.3. Empirical review

The real estate sector in Ethiopia is still in its early stages, and with the recent introduction of risk management concepts in businesses, research is scarce on real estate risk management in developing countries, particularly in Ethiopia. However, some studies have explored risk management practices in related sectors such as construction, banking, and insurance. These studies are reviewed below.

Hintsay (2016) conducted a survey within Ethiopia's construction industry to assess its experience and adoption of integrated risk management. The findings revealed a lack of formal risk management practices, with only 28.6% implementing such practices approved by their board of directors. This absence of structured risk management was identified as hindering the industry's performance and competitiveness. The researcher recommended a sustainable implementation of integrated risk management to foster success and growth.

Frezewd (2016) investigated project risk management in water supply projects in Batu and Dukem Town, highlighting the absence of a standardized risk management process and a clear strategy for risk response. While some risk identification and analysis were observed, proactive risk planning was lacking, indicating a gap between theoretical concepts and actual practices.

Furthermore, Frezewd (2016) and Hintsay (2016) discovered that formal risk management is hardly ever used in projects, particularly building projects. Delays and cost overruns are caused by the lack of thorough identification of the numerous risks and assessment of their impacts on project objectives. Additionally, they suggested risk planning and preparations in advance so that you can react appropriately and effectively when such hazards materialize.

Hana (2016) examined operational risk management practices in CBE, noting a generally established framework despite some areas needing improvement. The study was made through the combination of theory and practical work. The outcome of the study indicated that although some of its components are not always adhered to and need improvement, there is still a well-established framework to manage operational risks. The study suggested resource allocation, staff training, strengthening of risk culture, and enhanced mechanisms for risk measurement and reporting to improve risk management practices.

Other studies, such as Tsion (2015), focused on risk management practices in commercial banks, revealing a risk-focused approach but emphasizing the need for enhanced staff training and the integration of risk management throughout all processes.

Overall, these studies underline the necessity for a coordinated and integrated risk management framework. Even in organizations with a focus on risk, there's a gap between theory and practice. This study seeks to assess risk management practices in the Ayat real estate project, aiming to address this gap and contribute to the limited literature in the field.

2.4. Research gap analysis

A review of previous studies made on the subject reveals that most of the studies focus on Risk Management Plans of the organization and processes that they follow and make assessment of the risk awareness level of the employees but don't give much emphasis to the Professional assistance that the organization provides to the employees to raise the risk awareness level of its employees and Risk Registration System practice of the organization and how they learn and create an Improved Risk management Plan that incorporates the data registered from past projects to help feature project.

A coordinated and integrated risk management framework is required, according to the majority of risk management studies. Studies also show that there is a need to create awareness and build the capacity of project team members, strengthen the risk culture, and employ appropriate mechanisms for measurement and reporting of operational risk to improve risk management practices. Even in organizations that are risk-focused, there is still a gap that needs to be filled between the theory of project risk management which should be applied, and the actual practice that is performed. This study aims to assess the risk management practices of Ayat real estate in the hopes that the findings and recommendations could close such a gap and contribute to the very limited literature in the area.

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

This chapter discusses the research design, type and source of data collection, data collection method & design, research approach, target population, sample size and sampling technique, data collection procedures, method of data analysis, reliability, validity, and ethical consideration. The methodology describes the practical way in which the whole research project has been organized.

3.2. Description of the Study Area

The study area is in Addis Ababa, Ethiopia's rapidly growing capital city. As the economic and cultural heart of the nation, Addis Ababa is experiencing significant urbanization, placing a high demand on the construction sector to provide housing, commercial spaces, and infrastructure. Ayat Real Estate, a prominent developer in Addis Ababa, has undertaken the CCE Mall Apartment Project, located in a strategic location near key amenities and infrastructure. This project, with its 62 high-rise buildings aims to address the increasing demand for quality housing in the city. The CCE Mall Apartment Project serves as a case study to assess risk management practices within Ayat Real Estate, providing valuable insights for the broader construction industry in Addis Ababa.

3.3. Research Design

The main objective of the study is to assess risk management practices in building residential and commercial apartments in the case of Ayat Real Estate. This study is done on a descriptive approach to assessing the current risk management practices of Ayat Real Estate CCE mall apartment construction projects. Descriptive research is aimed at describing phenomena and is not particularly concerned with understanding why behavior is the way it is.

This study was conducted based on a descriptive mixed-method design. It involves collecting both qualitative and quantitative data concurrently and analyzing them equally. For quantitative data, a descriptive survey method was employed to analyze the collected data and the study collected qualitative data through open-ended questions. It was a triangulation of research techniques, which refers to a combination of mainly qualitative and quantitative methods of data collection and analysis. Quantitative and qualitative phases have occurred one after the

other, with the quantitative phase being given higher priority and mixing occurring during the data interpretation.

This method is more appropriate for gathering a variety of data related to the study and to analyze the data in a mixed type of quantitative and qualitative approach. The main reason why the mixed research method has been used for this study is that the method enables the researcher to look at the research problem using different techniques to gain an adequate understanding of the problem.

3.4. Data Type and Source

This research was carried out in the CCE mall apartment project of Ayat Real Estate to assess the risk management practices of their construction projects. The real estate industry is selected because it is mostly project-driven and vulnerable to risk and it is a less researched industry.

Source of data collection

To get the essential data and information, the researcher used both primary and secondary data. The primary data that is used in this study was collected through a structured questionnaire survey. A questionnaire is designed from a literature review of various factors affecting the success of construction projects.

The questionnaire was administered to a sample of Ayat Real Estate employees involved in the CCE Mall Apartment Project, aiming to gather data on:

Employee Risk Awareness and Perception: Assessing employees' understanding and attitudes toward risks affecting the project.

Risk Management Practices: Analyzing the specific methods used for risk planning, identification, analysis, response, monitoring, and evaluation.

Perceived Benefits of Risk Management: Investigating the perceived advantages of implementing a risk management plan, such as cost savings, schedule adherence, and improved project quality.

Difficulties Encountered in Risk Management: Identifying the primary obstacles faced in managing risks effectively, such as labor scarcity, regulatory changes, and resource constraints.

The questionnaire was given to a group consisting of project managers, members of project teams, risk officers and risk auditors who play a crucial role in project risk management, and construction site project engineers. Secondary data was gathered from sources like relevant literature, industry reports, case studies, internet sources, journal articles, and published materials, which have relevance to factors that affect construction risk management practices in the study area.

3.5. Target Population and Sampling Design

The population of the study comprises the stakeholders involved in construction projects who were involved in construction projects during the study time considered. The target population for this study encompasses all employees of Ayat Real Estate who are directly involved in the CCE Mall Apartment Project. This target population is estimated to be approximately 100 employees.

Sample size and sampling technique

To conduct the research; the researcher has used a purposive sampling technique. Purposive sampling is deemed most appropriate because it allows for the selection of participants with specific expertise and experience in risk management within the construction industry and the CCE Mall Apartment Project. This sampling strategy prioritizes selecting individuals who can provide valuable insights into the research questions.

Purposive sampling allows the researcher to target:

Project Managers: They have a comprehensive view of project risks and the implementation of risk management strategies.

Risk Officers and Auditors: They are directly responsible for developing and overseeing risk management plans and procedures.

Project Engineers: They have a deep understanding of the technical and operational aspects of construction projects, providing valuable insights into practical risk challenges.

Project Team Members: They offer a broader perspective on how risk management is perceived and implemented at the ground level.

Sample size determination

There are multiple methods for figuring out the sample size. These include conducting a census of tiny populations to mimic the sample size of comparable studies and arrive at a sample size of 80 with a 95% precision level for a total population of 100. After determining the target population, the next step is determining the sample size. For this step, the researcher used Yamane (1967) to provide a simplified formula to calculate sample sizes.

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

Where n is the sample size, N is the population size, and e is the level of precision.

By substituting the population size (N= 100) and assuming the level of confidence level 95%, i.e. e=0.05;

$$n = 100 / [1 + 100 (0.05)^2]$$

$$n = 80$$

According to the calculation, 80 employees were selected from the target population size.

Table 1: Sample size

Target population	Ayat Real Estate employees who work at the construction site of the CCE Mall apartment
Size of the target population	100
Sample size	80

In the context of the research population, it's important to note that not all stakeholders will serve as respondents to the questionnaire. Instead, the questionnaire will be distributed to Engineers and other professionals involved in the relevant construction projects during the specified period. To effectively achieve the research objectives and address the research questions, it's essential to target individuals possessing the requisite knowledge of the study's subject matter and those who bear significant roles and responsibilities in their respective projects' risk management processes. Consequently, 80 respondents, expected to provide

valuable insights for developing understanding, will be selected from the projects using non-probability purposive sampling.

The selection criteria for participants include:

Roles: Prioritizing individuals who hold positions directly related to risk management, such as project managers, risk officers, engineers, and risk auditors.

Experience Level: Including employees with varying levels of experience in construction projects and risk management to capture diverse perspectives.

3.6. Data Collection Method and Design

The researcher used primary sources of data. To get reliable information from the research participant's questionnaire types, data collection instruments have been identified as pertinent tools of this study.

Questionnaire

The survey comprises a structured and written series of both closed-ended and a small number of open-ended questions designed to gather relevant data from various participants within the specified study sample. These questions, incorporating both closed and open formats, were initially formulated by Abdulkudus (2022) with Cronbach's value of 0.96 and subsequently adjusted slightly by the researcher. This adaptation aims to gather information from respondents and evaluate the practices of risk management concerning the construction of residential and commercial complexes in the Ayat Real Estate case.

Accordingly, questionnaires that best answer the research questions and achieve research objectives are developed and distributed to a sample of selected respondents across the real estate project.

Close-ended questions in which respondents select a single response that they felt was most appropriate from a selection of choices are used in the survey. Close-ended questions were chosen in consideration of the fact that respondents are usually busy and this method enables the researcher to obtain responses promptly. Close-ended questions are also advantageous in that response choices can clarify the context of the question for the respondent as well as improve the consistency of responses. Moreover, the five-point rating scale was used in which each respondent was asked how great the statement or series of statements applied.

Procedure

All participants were informed about the study and were asked to participate in the study. A semi-structured questionnaire that has closed and open-ended questions was used to collect the data for this study. This combined strategy offers the flexibility of probing and exploring certain subjects in greater depth. The standard approach will be used in this study consisting of a series of pre-planned open-ended questions organized into several interrelating sections. The collected data were analyzed by using tables and descriptions.

Moreover, the researcher made the objective of the study clear to all respondents at the beginning of the questionnaire administration, to avoid confusion and facilitate ease of administration. A close follow-up was issued to immediately correct problems that arose during the filling of the questionnaire. Finally, all participant data was anonymized and kept confidential. Responses were linked to individual names, and all data was securely stored.

3.7. Data Analysis Technique

Data collected through questionnaires were analysed using quantitative descriptive and inferential statistics with the help of IBM SPSS Statistics version 27 statistical computer software. Descriptive analysis is used to reduce raw data collected through questionnaires into a meaningful summary and graph.

3.7.1. Descriptive analysis

Central tendency

The response of the 80 participants was summarized by averaging the rating of each participant for each variable. Descriptive statistics summarized and described the survey data, including means, standard deviations, frequencies, and percentages. According to Moidunny (2009), mean scores were interpreted as follows: scores ranging from 1.00 to 1.80 are considered very low, 1.81 to 2.60 are considered low, 2.61 to 3.20 are considered medium, 3.21 to 4.20 are considered high, and 4.21 to 5.00 are considered very high. This interpretation provided a framework for understanding the relative magnitude of mean scores within the study.

Qualitative data from the semi-structured questionnaire was analyzed. This process helped to uncover key insights into employees' experiences and perspectives on risk management practices.

3.8. Reliability and Validity

The Cronbach's Alpha for the questions was calculated and the value is greater than the acceptable value of 0.7 (Cronbach, L. J.,1951). This indicates that the research instrument is consistent. Reliability is checked using the SPSS 'Cronbach's-Alpha' test coefficients and the result is as follows.

Table 2: Reliability test results

Reliability Statistics			
Variables		No of items	Cronbach's alpha
Risk and risk management awareness and perception		5	0.988
Information about the risk management plan		6	0.968
Risk management practices	Risk planning	7	0.936
	Risk identification	8	0.85
	Risk analysis	7	0.93
	Risk response strategies	11	0.98
	Risk monitoring & control	5	0.82
Difficulties in managing of risks		3	0.81
Valid		52	0.910

(Source: Field survey, 2024)

As reliability is essential to ensure the results of the study are consistent and dependable, to test the reliability of the project work on assessing project risk management practices in construction projects, various methods have been utilized by the researcher:

1. **Test-Retest Reliability:** The researcher administers the same survey or questionnaire to a sample of respondents at two different time points and checks for consistency in their responses.
2. **Internal Consistency Reliability:** To evaluate how well items on a scale or questionnaire measure a single underlying construct, methods such as Cronbach's alpha can be employed. In this study, high alpha values have indicated that the items are internally consistent.

In the context of assessing project risk management practices in CCE mall apartment construction projects, a validity test has been applied to ensure that the research accurately measures what it intends to measure. Validity is tested and approved by gaining expert feedback before the distribution of the questionnaires. To validate the research findings, a method has been employed:

1. **Content Validity:** The researcher has ensured the surveys or questionnaires used to collect data, adequately cover all aspects of project risk management practices in construction projects. The researcher in the field has reviewed the instrument to confirm its relevance and comprehensiveness.

3.9. Ethical Consideration

When conducting this research on project risk management practices in construction projects, the researcher has upheld essential ethical standards to protect participants and maintain integrity in the study:

1. **Informed Consent:** Participants have been fully informed about the purpose of the study, their rights as participants, and any potential risks involved. The respondents have voluntarily consented to participate without coercion.
2. **Confidentiality:** The researcher ensures that participant data is kept confidential and anonymized wherever possible to protect privacy. The data have only been accessed by authorized personnel for research purposes.

By incorporating validity tests, reliability checks, and ethical considerations into the final project work on assessing project risk management practices in construction projects at Ayat Real Estate, the researcher has enhanced the rigor and credibility of the thesis findings while upholding ethical standards.

CHAPTER FOUR

4. RESULT, DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1. Introduction

This study chapter presents an in-depth analysis of the sample data gathered on the research topic, “Project Risk Management Practices in Construction Projects: A Case Study of Ayat Real Estate”. The study has developed a set of research questions tailored to the purpose and objectives of the investigation, focusing specifically on the Ayat Real Estate construction projects within its scope. These fundamental inquiries were designed to address various aspects of risk management within the context of the projects. Firstly, the research aims to assess the level of awareness among the employees involved. Additionally, it seeks to understand how real estate plans are structured to recognize, analyze, respond to, monitor, and evaluate risks effectively. Furthermore, the study aims to explore how implementing a risk management plan contributes to the project's overall success and adds value to its performance. Finally, it intends to identify and analyze the major challenges encountered in practicing risk management within the Ayat Real Estate projects. All the questionnaires were distributed to project managers, project engineers, members of the project implementation team, risk officers, and risk auditors of the real estate. The results and discussion contain the findings of the questions directed toward identifying the level of use of different risk management practices. The results are discussed and use the Likert scale with five points: Not applied, applied to some extent, well applied, greatly applied and applied to a very great extent. The data collected from these questionnaires gathered from purposively selected respondents, were meticulously inputted into the SPSS software. Subsequently, utilizing SPSS descriptive statistics, the data were analyzed to identify trends in the actual practices of risk management within Ayat real estate. These findings were then critically interpreted for insights and implications.

4.2. Response rate

A questionnaire booklet consisting of 54 questions was distributed to 80 individual respondents selected from the CCE mall apartment project. All of the 80 questionnaires distributed to the selected respondents were filled properly and returned. Therefore, this shows that the response rate (RR) was 100% which is more than suitable to proceed with. Accordingly, analysis and presentation were carried out as follows.

4.3. Personal information of the respondents

Part one of the questionnaires was intentionally designed to extract the general information – sex, age, educational level, working position, and work experiences of the respondents. Their distributions followed by their interpretations are summarized below.

Table 3: Distribution of respondents

		Frequency	Percent	Valid percent	Cumulative percent
AGE	20 - 30	33	41.3	41.3	41.3
	31 - 40	38	47.5	47.5	88.8
	41 - 50	4	5.0	5.0	93.8
	Above 51	5	6.2	6.2	100.0
	Total	80	100.0	100.0	
Gender	Female	38	47.5	47.5	47.5
	Male	42	52.5	52.5	100.0
	Total	100	100.0	100.0	
Working position	Project Manager	8	10.0	10.0	10
	Project Engineer	15	18.75	18.75	28.75
	Project Team member	50	62.5	62.5	91.25
	Risk Officer	3	3.75	3.75	95
	Risk Auditor	4	5	5	100.0
	Total	80	100.0	100.0	
Educational level	Certificate others	3	3.75	3.74	3.75
	Diploma	28	35.0	35.0	38.75
	Degree	44	55.0	55.0	93.75
	Postgraduate	5	6.25	6.25	100.0
	Total	80	100.0	100.0	
Work experience	Below 5 years	6	7.5	7.5	7.5
	B/n 5 & 10 years	44	55.0	55.0	62.5
	B/n 11 & 15 years	10	12.5	12.5	75.0
	B/n 16 & 20 years	20	25.0	25.0	100.0
	Total	80	100.0	100.0	

(Source: own survey results April 2024)

AGE: The provided demographic data presents information on the distribution of individuals based on age groups. The above table displays the frequency, percentage, valid percentage, and cumulative percentage for each age category.

- **20-30:** This age group comprises 33 individuals, representing 41.3% of the total sample. This indicates that a significant portion of the population falls within this younger age bracket. Their perspectives and approaches to risk management may be

influenced by their generational characteristics, such as adaptability to technology and innovative solutions.

- **31-40:** The age range of 31-40 includes 38 individuals, accounting for 47.5% of the total sample. This is the largest group in terms of frequency and percentage, indicating a substantial presence of individuals in their thirties and early forties. This age range typically encompasses professionals with considerable experience in their careers. Their prominence within the sample indicates that a significant portion of the workforce is in their prime working years, potentially contributing to a robust understanding and implementation of risk management practices.
- **41-50:** Individuals aged between 41 and 50 years old make up a smaller proportion of the sample, with only 5% (4 individuals) falling into this category. While these groups may represent a minority within the workforce, their presence is still notable. Older individuals may bring extensive industry experience and wisdom, potentially influencing risk management practices through their seasoned perspectives.
- **Above 51:** The age group above 51 consists of 5 individuals, representing 6.3% of the total sample. This group represents a smaller but notable segment of the population under study.

Overall analysis: The data suggests that the majority of individuals in the sample are relatively young, with a significant portion falling within the 31-40 age range. The distribution skews towards younger demographics, with fewer participants in older age brackets such as 41-50 and above 51. This demographic breakdown can have implications for various analyses or interpretations within the study, depending on the context and subject matter being studied. Understanding the age distribution of the sample can help provide insights into generational differences, preferences, behaviors, or responses to certain variables under investigation. The diverse age distribution within the sampled population suggests a varied range of experiences, perspectives, and approaches to risk management within Ayat Real Estate construction projects. Effectively harnessing this diversity and capitalizing on the strengths of each age group could lead to more comprehensive and robust risk management practices within the organization.

GENDER: The provided demographic data presents the distribution of gender within a sample population. The data indicates that out of a total of 80 individuals, 38 were female (47.5%) and 42 were male (52.5%). This information can be interpreted to understand the gender composition of the sample group.

Analysis: The data shows a slightly higher representation of males (52.5%) compared to females (47.5%) in the sample population. This suggests that there is a relatively balanced gender distribution within the group, with a slight skew towards males. It is important to note that the total percentage adds up to 100%, indicating that all individuals in the sample were categorized as either male or female.

Implications: The gender distribution in this sample may have implications for any research or analysis being conducted. Understanding the gender composition can help ensure that findings are representative and applicable to both males and females within the population under study. Additionally, researchers may need to consider potential gender-specific factors that could influence outcomes or results. The distribution within the Real Estate's sample population, indicating a relatively balanced representation of males and females, suggests potential benefits for the organization's risk management practices. With diverse perspectives and approaches likely stemming from this gender balance, the company could see enhanced risk assessment, mitigation, and decision-making processes. Tailoring risk management strategies to address the needs and preferences of different gender groups, along with promoting inclusivity and equity within risk management teams, could foster a more collaborative and innovative approach to risk management overall. Leveraging diversity as a strength presents an opportunity for Ayat Real Estate to develop a more comprehensive and resilient risk management framework. In conclusion, the demographic data provided indicates a nearly equal distribution of genders within the sample population, with a slightly higher percentage of males compared to females. This information is essential for interpreting and contextualizing any findings derived from the study.

WORKING POSITION: The provided demographic data seems to represent the distribution of different positions within a certain context, possibly related to a project or organization. The data is presented in a tabular format showing the position categories, their frequencies, and the corresponding percentages.

- **Project Manager:** This category has a frequency of 8, accounting for 10% of the total sample. This indicates that project managers make up a relatively small portion of the group.
- **Project Engineer:** With a frequency of 15 and a percentage of 18.75%, project engineers constitute a significant proportion of the sample, second only to members of the project implementation team.

- **Member of Project Implementation Team:** This category has the highest frequency at 50, representing 62.5% of the total sample. It appears that a majority of individuals in this dataset are part of the project implementation team.
- **Risk Officer:** The data shows that there are 3 individuals classified as risk officers, making up 3.75% of the sample. This position seems to be less common compared to others in this dataset.
- **Risk Auditor:** Lastly, there are 4 risk auditors in the dataset, accounting for 5 % of the total sample. Risk auditors still represent almost the same portion of the group as risk officers.

Implications: The provided demographic data offers insights into the distribution of various positions within the context of Ayat Real Estate construction projects, potentially shedding light on the organization's risk management structure. Notably, while project managers constitute a relatively small portion of the sample at 10%, project engineers and members of the project implementation team comprise significant proportions, at 18.75% and 62.5% respectively. This suggests that a substantial workforce is directly involved in project implementation, potentially indicating a strong focus on execution within the organization. However, the smaller representation of risk officers and risk auditors, at 3.75% and 5% respectively, suggests a less pronounced emphasis on dedicated risk management roles. This could imply a need for increased integration of risk management practices across all project phases and roles within Ayat Real Estate construction projects, ensuring that risk identification, assessment, and mitigation strategies are comprehensively embedded throughout the organization's operations.

EDUCATIONAL LEVEL: The provided demographic data pertains to the distribution of education levels among a sample population. The data is presented in a tabular format showing the frequency, percentage, valid percentage, and cumulative percentage for each education level category.

- **Certificate Level and Others:** This category represents 3.75% of the sample population, indicating that a small proportion of individuals have education at the certificate level or other similar qualifications.
- **Diploma Level:** The data shows that 35 % of the sample population holds education at the diploma level, which is higher than the percentage with a degree but still is significant.

- **Degree Level:** The largest group in the sample comprises individuals with education at the degree level, accounting for 55 % of the total sample.
- **Post Graduate Level:** A significant proportion of individuals, 23.8%, have attained education at the postgraduate level in this sample.

Implications: From this data, it can be inferred that the majority of individuals in the sample have education up to the degree level, followed by those with diplomas. Postgraduate qualifications are held by a significant segment of the population. This breakdown provides insights into the educational attainment levels within this specific group and can be used to analyze trends or make comparisons based on different educational categories. The demographic data concerning the distribution of education levels among the sample population of Ayat Real Estate construction projects offers insights into potential implications for risk management within the organization. Firstly, the substantial representation of individuals with degree-level education, comprising 55 % of the sample, suggests a pool of professionals with a solid academic foundation. Their higher educational attainment may correlate with enhanced analytical skills and a deeper understanding of risk management principles, potentially contributing to robust risk assessment and mitigation strategies within the organization. Moreover, the significant presence of individuals with education at the postgraduate level, accounting for 23.8% of the sample, indicates a cadre of employees with advanced knowledge and expertise. This cohort may be well-equipped to tackle complex risk management challenges, offering innovative solutions and contributing to the organization's overall risk resilience. Conversely, while individuals with education at the diploma level represent a substantial portion of the sample at 35 %, their lower level of educational attainment may imply a need for targeted training and development initiatives to strengthen their risk management competencies. Similarly, the smaller proportion of individuals with education at the certificate level or other similar qualifications (3.75%) suggests the importance of providing support and resources for continuous learning and professional development in risk management practices. Overall, the diverse educational backgrounds within the workforce of Ayat Real Estate construction projects present an opportunity to leverage a range of skills and expertise in enhancing risk management capabilities. By fostering a culture of continuous learning and knowledge sharing, the organization can capitalize on the strengths of its employees to develop comprehensive and effective risk management strategies tailored to the dynamic challenges of the real estate industry.

WORK EXPERIENCE: The demographic data provided in the table represents the distribution of individuals based on their years of experience. The table shows the frequency, percentage, valid percentage, and cumulative percentage for each category of experience level.

- **Below 5 years:** This category comprises 7.5% of the total sample, indicating that a small proportion of individuals have less than 5 years of experience.
- **Between 5 and 10 years:** The largest group falls within this range, accounting for 55% of the sample. This suggests that a significant portion of individuals have between 5 to 10 years of experience.
- **Between 11 and 15 years:** Approximately 12.5% of the sample falls into this category, indicating a smaller but still notable proportion of individuals with experience levels between 11 to 15 years.
- **Between 16 and 20 years:** The highest level of experience is seen in this category, with 25% of the sample having between 16 to 20 years of experience.

Overall Analysis: The data indicates a diverse distribution of experience levels among the sample population. The majority fall within the range of 5 to 10 years and between 16 to 20 years, suggesting a mix of both mid-career professionals and more seasoned individuals. The distribution across these categories provides insight into the composition and expertise levels within the studied group.

Implications: The demographic data regarding the distribution of individuals based on their years of experience provides valuable insights into the potential implications for risk management within Ayat real estate construction projects. Firstly, the significant proportion of individuals with experience levels between 5 and 10 years, comprising 55% of the sample, suggests a substantial workforce with moderate to mid-level experience. These individuals likely possess a solid understanding of industry practices and may have encountered various risk scenarios throughout their careers, enabling them to contribute effectively to risk management efforts within the organization. Additionally, the presence of individuals with higher levels of experience, particularly those with between 16 and 20 years of experience representing 25% of the sample, indicates a cohort of seasoned professionals. Their extensive industry knowledge and tenure may provide valuable insights into identifying, assessing, and mitigating risks, contributing to the development of robust risk management strategies tailored to the unique challenges of real estate construction projects.

Conversely, the smaller proportions of individuals with less than 5 years of experience (7.5%) and between 11 and 15 years of experience (12.5%) suggest a need for targeted support and

training initiatives to enhance their understanding of risk management practices. Investing in the professional development of employees across all experience levels can help cultivate a risk-aware culture within the organization and ensure that risk management processes are effectively implemented and integrated into project planning and execution. Overall, the diverse range of experience levels within the workforce of Ayat Real Estate construction projects presents an opportunity to leverage a blend of expertise and perspectives in developing comprehensive risk management strategies. By harnessing the collective knowledge and experience of its employees, the organization can enhance its resilience to potential risks and strengthen its ability to navigate challenges in the dynamic real estate industry.

4.4. Descriptive Analysis

In the second part of the questionnaire, the respondents are asked questions that are directly related to the research's objective. As the purpose of the study is to assess the risk management practice of Ayat Real Estate projects, the introductory questions are designed to provide general information and insight into the actual risk management practices of CCE mall apartment projects. Respondents were asked to answer questions based on a five-point Likert scale in which 1 represented 'Not applied' and 5 represented 'Applied to a very great extent'.

4.4.1. Project risk and risk management awareness and perception

According to PMI (2017), risk management awareness and perception refers to the understanding, attitudes, and beliefs that individuals or organizations hold regarding project risks and the processes involved in managing them. It encompasses how stakeholders perceive the importance of risk management, their level of knowledge about risk factors, and their willingness to engage in risk management activities. High levels of awareness and positive perceptions of risk management are associated with improved risk identification, proactive risk mitigation, and a culture that values risk-aware decision-making. The implication of project risk and risk management awareness and perception of project risk management practice within Ayat real estate construction projects is significant. Firstly, a thorough understanding of project risks and effective risk management practices is essential for mitigating potential threats and maximizing opportunities for project success. Therefore, fostering awareness and promoting positive perceptions of risk management among stakeholders within Ayat Real Estate can lead

to improved risk identification, more informed decision-making, and proactive risk mitigation strategies.

The respondents were presented with questions targeted to know the general risk management awareness, perception, and know-how, and their responses are summarized as follows.

Table 4: Descriptive Statistics of Risk and risk management awareness and perception

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Training programs for risk awareness	80	-	35 (43.8 %)	27 (33.8 %)	18 (22.5 %)	-	2.78	0.79	0.62
Defined risk management process	80	-	36 (45 %)	25 (31.3 %)	19 (23.8 %)	-	2.78	0.8	0.65
Guidelines for managing unexpected risks	80	1 (1.3%)	35 (43.8 %)	25 (31.3 %)	19 (23.8%)	-	2.77	0.82	0.68
Assignment of responsibilities to handle risks	80	1 (1.3%)	35 (43.8 %)	26 (32.5 %)	18 (22.5 %)	-	2.76	0.81	0.66
Communication of risk information	80	-	36 (45 %)	25 (31.3 %)	19 (23.8 %)	-	2.78	0.8	0.65
Valid N (listwise)	80								

(Source: own survey results April 2024)

The respondents' responses and output of SPSS data on risk and risk management awareness and perception have been analyzed as follows:

- 1. Training Programs for Risk Awareness:** The mean score of 2.78 indicates that, on average, Ayat Real Estate arranges some training and meetings to raise employee awareness of risk. The standard deviation of 0.79 suggests that there is some variability in responses regarding the effectiveness or frequency of these training programs.
- 2. Defined Risk Management Process:** Similarly, with a mean score of 2.78 suggesting that, on average, respondents perceive that the real estate does have some form of defined risk management process in place to identify and address risks. It indicates a moderate level of agreement that such a process exists. However, the standard deviation

of 0.81 suggests that there might be variations in the clarity, consistency, and accessibility of this process.

3. **Guidelines for Managing Unexpected Risks:** The mean score of 2.77 with a standard deviation of 0.82, indicates that, on average, respondents perceive that there is some guideline available to manage unexpected risks. However, the slightly higher standard deviation compared to other questions may imply varying levels of clarity or accessibility of these guidelines.
4. **Assignment of Responsibilities for Handling Risks:** With a mean score of 2.76 and a standard deviation of 0.81, suggesting that, on average, respondents perceive that there is some form of responsibility assigned to handle risks when they occur. The variance value of 0.66 indicates some dispersion in responses regarding the effectiveness or efficiency of this assignment process.
5. **Communication of Risk Information:** The data shows that risk information is consistently communicated and shared across projects and departments within the real estate, as indicated by a mean score of 2.78 and a standard deviation of 0.8. This suggests an active effort to ensure transparency and awareness regarding risks throughout the organization.

Overall, based on the SPSS output data provided, the average mean value of 2.78 suggests that, on average, respondents perceive that the real estate has moderate to somewhat good practices in place for risk management. While it indicates that there are measures taken such as training, defined processes, guidelines, and assigned responsibilities for handling risks, there might be room for improvement in certain areas to enhance the effectiveness and efficiency of risk management practices within the real estate.

These findings suggest that Ayat Real Estate might benefit from revisiting its risk awareness training programs, developing more accessible and detailed guidelines for managing unexpected risks, and prioritizing clear and consistent communication of risk information across all project teams and departments.

According to Fiker (2021), findings from a survey were conducted to assess risk management practices within Noah Real Estate. Analysis of respondent feedback reveals several key insights. Firstly, a significant majority, comprising 70% of respondents, indicated the presence of a defined risk management process within their companies. Additionally, half of the

respondents affirmed the existence of guidelines for managing unexpected risks, suggesting a moderate level of preparedness in this area.

Furthermore, a substantial portion, accounting for 60% of participants, identified the assignment of responsible individuals for handling risks in projects, highlighting a proactive approach to risk mitigation. However, concerning the communication of risk information, while 50% of respondents acknowledged consistent communication across projects and departments, a notable portion expressed uncertainty or disagreement on this matter. This signals a potential area for improvement in enhancing communication channels to ensure comprehensive risk awareness and management. Overall, the findings underscore the importance of robust risk management frameworks in the construction sector and emphasize the need for continual evaluation and refinement to mitigate potential risks effectively.

Overall, this comparison highlights differences in the perception of risk management practices between Ayat Real Estate and Noah Real Estate, with Noah Real Estate generally perceived to have more robust practices in place.

4.4.2. Information about the Risk Management Plan

In this section of the survey, the respondents were asked about having effective and efficient risk management plans, developing a risk management plan including stakeholders, using previous data for risk management, developing a risk breakdown structure, allocating proper cost and resources for risk management, and risk management activity definition in the schedule.

According to PMI (2017), a risk management plan is a structured document that outlines how risks will be identified, assessed, managed, and monitored throughout a project or within an organization. It typically includes details such as risk identification methods, risk analysis techniques, risk response strategies, roles and responsibilities of team members, communication protocols, and contingency plans. Having a risk management plan will enable a real estate company to identify, assess, and mitigate risks, thereby enhancing the likelihood of project success, minimizing financial losses, and maintaining a favorable reputation in the industry. It will also foster a culture of risk awareness and proactive risk management practices within the organization, contributing to long-term sustainability and competitiveness.

Table 5: Descriptive Statistics of Information about Risk Management Plan

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Effective and efficient risk management plan	80	-	36 (45 %)	25 (31.3 %)	19 (23.8%)	-	2.78	0.80	0.65
Stakeholders' involvement	80	3 (3.8%)	34 (42.5 %)	24 (30 %)	19 (23 %)	-	2.73	0.86	0.75
Use previous data to develop a risk management plan	80	-	39 (48.8 %)	24 (30 %)	17 (21.3)	-	2.72	0.79	0.63
Use of Risk Breakdown Structure (RBS)	80	6 (7.5 %)	31 (38.8 %)	25 (31.3 %)	18 (22.5 %)	-	2.68	0.90	0.82
Inclusion of resources and cost estimation	80	4 (5 %)	35 (43.8 %)	22 (27.5 %)	19 (23.8 %)	-	2.70	0.89	0.79
Risk management activities defined and included in the schedule	80	2 (2.5 %)	34 (42.5 %)	27 (33.8 %)	17 (21.3 %)	-	2.73	0.82	0.67
Valid N (listwise)	80								

(Source: own survey results April 2024)

The respondent's responses and output of SPSS data on information about risk management plan have been analyzed as follows:

1. **Effectiveness and Efficiency of Risk Management Plan:** The mean score of 2.78 suggests that, on average, respondents perceive the real estate's risk management plan to be somewhat effective. There is a moderate level of agreement. However, the relatively high standard deviation of 0.81 indicates a considerable variability in opinions among respondents regarding the effectiveness of the plan.
2. **Stakeholders Involvement:** With a mean score of 2.74, it appears that stakeholders are moderately included in developing the risk management plan. The standard deviation of 0.87 implies some diversity in perceptions regarding stakeholder involvement.

3. **Utilization of Previous Data for Risk Management:** The mean score of 2.73 indicates that previous data is used to some degree in developing the risk management plan. The low standard deviation of 0.80 suggests a more consistent opinion among respondents on this aspect compared to others.
4. **Use of Risk Breakdown Structure (RBS):** The mean score of 2.69 suggests that there is moderate usage of RBS to define risk categories within the real estate's risk management framework. The relatively high standard deviation of 0.91 indicates varying levels of agreement among respondents regarding this practice.
5. **Inclusion of Resources and Costs Estimation:** With a mean score of 2.70, it seems that estimated resources and costs needed for risk management activities are moderately included in project planning. The standard deviation of 0.89 points to some level of disagreement or variability among respondents on this aspect.
6. **Definition and Inclusion of Risk Management Activities in Schedule:** The mean score of 2.74 indicates that risk management activities are somewhat defined and included in the project schedule by the real estate company. The standard deviation of 0.82 suggests some diversity in opinions regarding these practices.

The overall mean score of approximately 2.73 suggests that, on average, respondents perceive the real estate to have moderately effective risk management plan. The findings suggest that while there is moderate perception of effectiveness, inclusivity of stakeholders, utilization of previous data, usage of Risk Breakdown Structure (RBS), inclusion of resources and costs estimation, and definition of risk management activities in the project schedule within the real estate's risk management framework, there is considerable variability in opinions among respondents. This variability indicates that there are differing views on these aspects among stakeholders. However, despite the diversity in perceptions, there appears to be a consistent opinion regarding the utilization of previous data for risk management, with a relatively low standard deviation suggesting a more uniform perspective on this particular aspect compared to others.

Based on the observation of Fiker (2021), research conducted on Noah Real Estate, it appears that the majority of respondents perceive the company's risk management practices to be fairly effective across various aspects. For instance, over 51% of respondents believe that the company has an effective and efficient risk management plan to a very great extent, with an

additional 30.5% indicating that it is greatly applied. Similarly, regarding the inclusion of key stakeholders in developing the risk management plan, 42.7% of respondents view this aspect as well applied, with 24.4% considering it greatly applied. Furthermore, there is a substantial portion of respondents who believe that previous data is effectively utilized for risk management planning (32.9% well applied, 28% greatly applied). Additionally, the use of risk breakdown structures and the allocation of resources and costs for risk management activities seem to receive positive perceptions from respondents.

Overall, while both sets of findings indicate a generally positive perception of their company's risk management plan, the first set provides more nuanced insights into specific practices and areas for improvement. It offers a more comprehensive understanding of respondents' perceptions, allowing for targeted efforts to enhance risk management practices where needed.

4.4.3. Risk Management Practices

Risk Planning

According to PMI (2017), planning risk management involves establishing how risk management activities will be conducted throughout a project's lifecycle. It includes defining the approach, methodologies, tools, and resources that will be used to identify, assess, prioritize, and mitigate risks.

Risk planning in risk management is the foundational step in proactively managing uncertainties that can impact a project's success. It involves defining how risk management activities will be conducted throughout the project lifecycle. Think of it as creating a roadmap to anticipate, assess, and respond to potential risks effectively.

In the context of the real estate construction project, planning risk management involves creating a structured framework to anticipate, evaluate, and address potential risks that may affect the project's objectives. Planning risk management for the real estate construction project encompasses establishing a clear strategy to identify, assess, and respond to risks effectively throughout the project lifecycle. This involves outlining methodologies and processes for risk identification, ensuring early detection, and proactive mitigation of potential threats.

Table 6: Descriptive Statistics of Risk Planning

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Considering risks in strategic planning	80	-	32 (40 %)	23 (28.7 %)	25 (31.3 %)	-	2.91	0.84	0.71
Updating policies and guidelines	80	-	33 (41.3 %)	31 (38.8 %)	16 (20 %)	-	2.78	0.75	0.57
Considering emerging trends	80	-	40 (50 %)	25 (31.3 %)	15 (18.8 %)	-	2.68	0.77	0.59
Pre-risk management planning meetings	80	4 (5 %)	35 (43.8 %)	22 (27.5 %)	19 (23.8 %)	-	2.7	0.89	0.79
Create a contingency plan	80	1 (1.3 %)	37 (46.3 %)	19 (23.8 %)	23 (28.7 %)	-	2.8	0.87	0.77
Stakeholder involvement in risk management planning	80	3 (3.8 %)	34 (42.5 %)	19 (23.8 %)	24 (30 %)	-	2.8	0.91	0.84
Consideration of risks due to environmental factors	80	1 (1.3 %)	37 (46.3 %)	20 (25 %)	22 (22 %)	-	2.78	0.86	0.75
Valid N (listwise)	80								

(Source: own survey results April 2024)

The respondent's responses and output of SPSS data on risk management practices of risk planning issues have been analyzed as follows:

1. Considering Risks in Strategic Planning: The mean value of 2.91 suggests that, on average, potential risks are moderately considered during the development of corporate plans

and strategic initiatives among the respondents surveyed. However, the standard deviation of 0.84 suggests a significant range of opinions on this practice.

2. Updating Policies and Guidelines: The mean value of 2.78 suggests that internal policies and guidelines are also moderately updated to meet evolving regulatory requirements and best practices in risk management according to the respondents surveyed. It shows the real estate is moderately responsive to regulatory changes. The high standard deviation of 0.75 indicates a wide range of responses, reflecting varying levels of adherence to regulatory changes.

3. Considering Emerging Trends: The mean value of 2.68 indicates that strategic plans tend to consider emerging trends and disruptive technologies that could pose risks to the real estate at a slightly lower level compared to other aspects evaluated in the survey responses. However, the standard deviation of 0.77 indicates that there might be differences in how effectively this is implemented.

4. Pre-risk Management Planning Meetings: The mean score of 2.70 for the project implementation team conducting pre-risk management planning meetings suggests a moderate level of engagement in this practice. However, the standard deviation of 0.89 indicates variability in the frequency and effectiveness of these meetings.

5. Create a Contingency Plan: The mean value of 2.80 suggests that, on average, the project implementation team does create contingency plans in case the first or second plan does not work. The standard deviation of 0.87 indicates some variability in responses among the participants regarding the extent to which contingency plans are created.

6. Stakeholder Involvement in Risk Management Planning: The mean value of 2.80 implies that, on average, every important stakeholder of the project is involved in risk management planning. The standard deviation of 0.91 suggests some dispersion in responses regarding the level of stakeholder involvement.

7. Consideration of Risks Due to Environmental Factors: The mean value of 2.78 indicates that, on average, risks due to environmental factors are taken into consideration during the risk planning process. The standard deviation of 0.867 shows some variation in responses regarding the extent to which environmental risks are considered.

Based on the provided SPSS output data the overall average mean value of the findings is approximately 2.78. Interpreting this result, it can be said that, on average, the level of consideration for risk management across all the aspects measured in the findings is moderately high, leaning towards a higher level of consideration. It suggests that there is a consistent effort to address and mitigate risks throughout the corporate planning and project implementation

processes within the real estate context. Furthermore, the project implementation team tends to create contingency plans if the initial plans do not work, important stakeholders are generally involved in risk management planning, and risks arising from environmental factors are typically considered during the risk planning process.

The survey from Kalkidan (2017) delved deeper into specific aspects of risk management within Flintstone homes construction projects, revealing both strengths and areas for improvement. Notably, a significant proportion of respondents (40% disagreeing and 30% uncertain) suggested a lack of pre-risk management planning meetings, indicating a potential gap in proactive risk identification and mitigation strategies. However, the data also highlighted positive practices, with 80% of respondents confirming the creation of contingency plans to address unforeseen risks effectively. Moreover, an impressive 80% agreement rate was observed regarding the involvement of key stakeholders in risk management planning, underscoring a collaborative approach to risk mitigation. Additionally, the survey indicated a commendable level of consideration for environmental factors in risk planning, with 70% of respondents acknowledging their importance. This emphasizes the necessity of environmental awareness to anticipate and mitigate potential project disruptions. Overall, while certain areas require attention, the findings reflect a commitment to robust risk management practices in the construction industry, with opportunities for enhancement to ensure comprehensive risk mitigation throughout project lifecycles.

Risk identification

According to PMI (2017), risk identification is the process of systematically recognizing and documenting potential risks that could affect the success of a project. It involves identifying both threats that could negatively impact the project objectives and opportunities that could positively influence them. In the context of a real estate project, risk identification would involve identifying various factors or events that could potentially hinder or enhance the project's progress, such as delays in construction, changes in market conditions, regulatory issues, or unexpected cost overruns. The implication of risk identification on project risk management for a real estate project is multifaceted and crucial for project success.

Table 7: Descriptive Statistics of Risk Identification

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Tools and processes	80	1 (1.3 %)	38 (47.5 %)	19 (23.8 %)	22 (27.5 %)	-	2.77	0.87	0.75
Brainstorming session	80	37 (46.3 %)	34 (42.5 %)	3 (3.8 %)	6 (7.5 %)	-	1.72	0.85	0.73
Use of risk checklists	80	2 (2.5 %)	37 (46.3 %)	18 (22.5 %)	23 (28.7 %)	-	2.77	0.89	0.80
Risk registries	80	-	37 (46.3 %)	28 (35 %)	15 (18.8 %)	-	2.72	0.76	0.58
Use expert judgment	80	-	36 (45 %)	30 (37.5 %)	14 (17.5 %)	-	2.72	0.74	0.55
Experience and review	80	2 (2.5 %)	31 (38.8 %)	36 (45 %)	11 (13.8 %)	-	2.70	0.73	0.54
Involvement of key participants	80	23 (28.7 %)	30 (37.5 %)	24 (30 %)	3 (3.8 %)	-	2.08	0.85	0.73
Categorization of identified risk	80	-	31 (38.8 %)	36 (45 %)	13 (16.3 %)	-	2.77	0.71	0.50
Valid N (listwise)	80								

(Source: own survey results April 2024)

The respondent's responses and output of SPSS data on risk identification have been analyzed as follows:

- 1. Tools and Process:** The mean score of 2.77 indicates that the real estate generally has processes or tools for project risk identification, with a moderate level of agreement among respondents.
- 2. Brainstorming Sessions:** With a mean score of 1.72, it appears that the real estate does not frequently conduct brainstorming sessions for risk identification, as the score is closer to "applied to some extent" on the scale. It indicates a relatively low frequency of conducting brainstorming sessions
- 3. Risk Checklists:** The mean score of 2.77 suggests there is a moderate level of utilization of risk checklists for risk identification within the real estate.

4. **Risk Registries:** The mean score of 2.72 indicates the moderate presence of risk registries within the real estate for tracking identified risks.
5. **Expert Judgment:** The mean score of 2.72 implies that expert judgment is utilized for identified risks, showing a moderate level of agreement among respondents.
6. **Experience and Review:** With a mean score of 2.7, it seems there is a moderate level of experience and review of risk identification processes within the real estate.
7. **Involvement of Key Participants:** The lower mean score of 2.08 suggests that not all key project participants are consistently involved in risk identification activities.
8. **Categorization of Identified Risks:** The mean score of 2.77 indicates is moderately present within the real estate sector for organizing identified risks.

From the SPSS output data provided, the average mean of the findings is approximately 2.53. it can be inferred that while certain aspects such as project risk identification, use of risk checklists, expert judgment, and maintaining a risk registry are well-established practices in real estate, there may be room for improvement in areas like conducting brainstorming sessions and ensuring the involvement of all key project participants in the risk identification process. Overall, the real estate demonstrates a moderate commitment to risk identification processes, with potential opportunities to enhance effectiveness and inclusivity in risk management practices.

As observed by Kalkidan (2017), respondents predominantly rely on expert judgment, brainstorming, document analysis, and SWOT analysis for risk identification in Flintstone homes construction projects. Expert judgment is utilized 80% of the time, while brainstorming and document analysis techniques are universally employed (100% frequency). SWOT analysis is commonly used in 90% of cases. However, concerning risk registration updates, only 30% of respondents agree on their regularity, indicating a potential gap in maintaining up-to-date risk information. This highlights the need for improved practices to ensure accurate risk management. In summary, while there are similarities in the techniques employed for risk identification between Ayat real estate and Flintstone homes construction projects, there are differences in the frequency of technique usage and challenges in maintaining up-to-date risk information. These comparisons highlight the importance of effective risk management practices across various industries and the need for continuous improvement to ensure accurate risk identification.

Risk analysis

According to PMI (2017), risk analysis is the process of systematically assessing risks to understand their potential impact and likelihood of occurrence. It involves identifying and evaluating risks, determining their significance, and prioritizing them for appropriate response strategies. In the context of Ayat real estate, risk analysis entails examining various factors that could affect the success of construction projects, such as market fluctuations, construction delays, regulatory changes, and financial risks.

Table 8: Descriptive Statistics of Risk Analysis

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Qualitative risk analysis	80	-	35 (43.8 %)	38 (47.5 %)	7 (8.8 %)	-	2.65	0.63	0.40
Quantitative risk analysis	80	-	35 (43.8 %)	38 (47.5 %)	7 (8.8 %)	-	2.65	0.63	0.40
Cause-and-effect risk analysis	80	1 (1.3 %)	36 (45 %)	35 (43.8 %)	8 (10 %)	-	2.62	0.68	0.46
Contingency plan for risk analysis	80	20 (25 %)	34 (42.5 %)	23 (28.7 %)	3 (3.8 %)	-	2.11	0.82	0.68
Assessing of probability	80	8 (10 %)	35 (43.8 %)	32 (40 %)	5 (6.3 %)	-	2.42	0.75	0.57
Identification of risks requiring attention	80	2 (2.5 %)	37 (46.3 %)	25 (31.3 %)	16 (20 %)	-	2.68	0.82	0.67
Presence of risk matrix	80	4 (5 %)	33 (41.3 %)	25 (31.3 %)	18 (22.5 %)	-	2.71	0.87	0.76
Valid N (listwise)	80								

(Source: own survey results April 2024)

The SPSS output data provided pertains to various aspects of risk analysis within the real estate.

Let's delve into the interpretation of the data presented:

- 1. Qualitative Risk Analysis:** On average, there is a moderate presence of established qualitative risk analysis methods and tools within the real estate. The standard deviation of 0.63 suggests that there is some variability in the responses.

2. **Quantitative Risk Analysis:** Similarly, with a mean score of 2.65 and a standard deviation of 0.63, it appears that there is a moderate presence consistent of processes in place across the real estate to quantify risks.
3. **Cause-and-effect Risk Analysis:** The mean score of 2.62 suggests that while there is some consideration given to cause-and-effect relationships in risk analysis, there may be room for improvement. The higher standard deviation of 0.68 indicates more variability in responses compared to the previous questions.
4. **Contingency Plan for Risk Analysis:** With a mean score of 2.11 and a relatively high standard deviation of 0.82, it seems there is a relatively lower presence of contingency plans for risk analysis within the real estate.
5. **Assessing of Probability:** The mean score of 2.42 indicates that, on average, there is a moderate level of assessment of the probability of achieving specific project objectives within the real estate sector. The variance value of 0.57 suggests significant variability in responses regarding this aspect.
6. **Identification of Risks Requiring Attention:** The Real estate seems to be relatively better at identifying risks that require attention by quantifying their relative contribution to overall project risk management, as indicated by a mean score of 2.68. However, the high standard deviation of 0.82 implies varying levels of effectiveness in this area among different firms.
7. **Presence of Risk Matrix:** With a mean score of 2.71, it indicates a moderate presence of risk matrices within the real estate for defining the probability or likelihood and the impact of risks. The variance value being relatively high at 0.76 suggests some diversity in how these matrices are structured or utilized.

Overall, from the SPSS output data provided, So, the average mean of the findings is approximately 2.69. it suggests that, on average, there is a moderate level of engagement in various risk analysis and management practices within the real estate. Ayat Real Estate demonstrates a commitment to establishing qualitative and quantitative risk analysis methods and tools, assessing the probability of achieving project objectives, identifying and prioritizing risks, and utilizing risk matrices. However, there may be room for improvement, particularly in areas such as contingency planning for risk analysis. Overall, the average mean indicates a balanced approach to risk management practices within the real estate sector, with potential for further refinement and enhancement. insights into the current state of risk analysis practices

within the real estate, highlighting areas where improvements can be made to enhance risk management strategies.

According to Kalkidan's (2017) findings, the respondents acknowledge the presence of a formal risk assessment system within Flintstone homes, the data reveals a concerning discrepancy in the utilization of quantitative risk analysis. While 50% agree on the use of qualitative risk analysis, only 20% confirm the use of quantitative methods, with 80% expressing uncertainty. This indicates a potential deficiency in analyzing risks numerically to determine contingency reserves accurately. However, the survey suggests that risk assessment primarily relies on experience, with 80% of respondents agreeing that the probability of risk occurrence is assessed based on historical data. This reliance on experience underscores the need for enhancing quantitative risk analysis methods to ensure comprehensive risk management practices within construction projects.

Kalkidan's (2017) findings reveal a concerning discrepancy in the use of quantitative risk analysis methods, indicating a potential deficiency in accurately determining contingency reserves. While the Ayat real estate shows reliance on risk matrices and identifies risks needing attention, Kalkidan's study underscores a predominant reliance on experience for risk assessment, emphasizing the need to enhance quantitative methods for comprehensive risk management, especially in construction projects.

Risk response strategies

According to PMI (2017), risk response strategies are proactive measures undertaken to address identified risks in a project effectively. These strategies are formulated to either mitigate the impact of negative risks (threats) or exploit positive risks (opportunities). Risk response strategies are the proactive measures you take to address identified risks in a project. They are the action plans you develop to either mitigate the impact of negative risks (threats) or exploit positive risks (opportunities).

In the context of real estate construction projects, risk response strategies play a crucial role in managing uncertainties and ensuring project success. Implementing risk response strategies in real estate construction projects yields significant implications for risk management.

Table 9: Descriptive Statistics of Risk Response Strategies

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Techniques of risk responses in place	80	-	39 (48.8 %)	25 (31.3 %)	16 (20 %)	-	2.71	0.78	0.61
Risk avoidance technique	80	4 (5%)	39 (48.9 %)	23 (28.7 %)	14 (17.5 %)	-	2.58	0.83	0.70
Contingency planning	80	45 (56.3 %)	35 (43.8 %)	-	-	-	1.43	0.49	0.24
Risk Transfer techniques to a third party	80	-	39 (48.8 %)	24 (30 %)	17 (21.3 %)	-	2.72	0.79	0.63
Risk acceptance/retention	80	-	34 (42.5 %)	39 (48.8 %)	7 (8.8 %)	-	2.66	0.63	0.40
Reduce risk to an acceptable threshold level	80	1 (1.3 %)	39 (48.8 %)	28 (35 %)	12 (15 %)	-	2.63	0.75	0.56
Combinations of risk responses	80	3 (3.8 %)	42 (52.5 %)	20 (25 %)	15 (18.8 %)	-	2.58	0.83	0.70
Personnel assigned for each agreed risk response	80	8 (10 %)	43 (53.8 %)	18 (22.5 %)	11 (13.8 %)	-	2.40	0.85	0.72
Contingency plan allocates for time	80	3 (3.8%)	45 (56.3 %)	20 (25 %)	12 (15 %)	-	2.51	0.79	0.63
Contingency plan allocates for cost	80	34 (42.5 %)	38 (47.5 %)	7 (1.3 %)	1 (1.3 %)	-	1.68	0.68	0.47
Stakeholders' satisfaction with risk response strategies	80	-	38 (47.5 %)	27 (33.8 %)	15 (18.8 %)	-	2.71	0.76	0.58
Valid N (listwise)	80								

(Source: own survey results April 2024)

The SPSS output contains descriptive statistics related to various risk response strategies implemented by Ayat Real Estate. Let's analyze each section individually:

- 1. Technique of Risk Response in Place:** The mean is 2.71, indicating a moderate to high level of having risk response techniques established within the real estate practices
- 2. Risk Avoidance Technique:** With a mean of 2.58, risk avoidance techniques are used moderately, where alternative actions are taken to mitigate risks. This suggests that the

real estate company occasionally opts for risk avoidance by choosing alternative courses of action to reduce potential risks.

3. **Contingency Planning:** The mean score for having a contingency plan in place is 1.43, indicating that the real estate company has some level of preparedness for unforeseen risks. However, the relatively low mean suggests room for improvement in this area.
4. **Risk Transfer to Third Party:** With a mean score of 2.72, it appears that the real estate company frequently employs risk transfer techniques, such as utilizing insurance services provided by third parties, to manage and mitigate risks effectively.
5. **Risk Acceptance/Retention:** The mean score for risk acceptance/retention is 2.66, indicating that the company is moderately inclined towards accepting and retaining certain risks rather than actively seeking to eliminate or transfer them.
6. **Risk Reduction to Acceptable Threshold Level:** The mean score of 2.63 suggests that the real estate company strives to reduce risks to an acceptable threshold level, although there may be variability in how consistently this objective is achieved across different scenarios.
7. **Combination of Risk Responses:** The mean is 2.58, indicating a moderate level of utilizing a combination of risk response strategies.
8. **Personnel Assigned for Agreed Risk Responses:** The mean value of 2.40 suggests that, on average, there is personnel assigned for each agreed risk response in the real estate such as health and safety management or risk officers. The standard deviation of 0.85 indicates that there is some variability in the extent to which personnel are allocated for risk responses.
9. **Contingency Plan Allocation for Time:** The mean value of 2.51 implies that, on average, the contingency plan allocates time for addressing risks in real estate projects. However, the high standard deviation of 0.79 indicates a wide variation in how time allocation is managed across different projects or organizations.
10. **Contingency Plan Allocation for Cost:** The mean value of 1.68 suggests that there is some allocation for cost within contingency plans for risk management in real estate. The relatively low standard deviation of 0.68 indicates that there is less variability in cost allocation compared to time allocation.
11. **Stakeholders' Satisfaction with Risk Response Strategies:** The mean value of 2.71 indicates that stakeholders generally express satisfaction with the risk response strategies implemented in real estate projects. However, the high standard deviation of

0.77 suggests significant variability in stakeholder satisfaction levels across different projects or scenarios.

Overall, findings from a survey of 80 individuals in the Ayat real estate shed light on risk response strategies. The average mean of the findings is approximately 2.60. This suggests that, on average, the level of implementation or presence of various risk response techniques and strategies within the real estate falls between moderate to moderately high. While risk avoidance is occasionally used, there's room for improvement in contingency planning. Risk transfer to third parties is frequent, reflecting proactive risk mitigation. The sector shows moderate acceptance of certain risks. A combination of risk responses is common, with variability in personnel assignment and time allocation in contingency plans. Stakeholders generally express satisfaction with risk strategies, although satisfaction levels vary. These insights highlight both strengths and areas for enhancement in real estate risk management. Overall, the real estate appears to have a reasonable level of preparedness in responding to risks, with some areas potentially requiring more attention and enhancement.

Based on the study of Fiker (2021), analysis of respondent feedback on risk response strategies reveals the prevalent utilization of risk avoidance, risk transfer, risk mitigation, and risk acceptance within Noah Real Estate construction projects. Risk avoidance and risk mitigation are reported to be employed universally, with 100% frequency. Risk transfer is utilized in 80% of cases, while risk acceptance is employed 100% of the time. This data suggests a strong reliance on risk avoidance, mitigation, and acceptance as primary approaches to managing risks within projects. However, the frequency of risk transfer indicates a significant but slightly lesser emphasis on this strategy. Overall, the findings highlight a comprehensive approach to risk response, with a focus on minimizing potential impacts and maximizing project success.

While both findings focus on minimizing potential impacts and maximizing project success through various risk response strategies, Fiker's study highlights a more comprehensive approach within the specific context of construction projects at Noah Real Estate. As the descriptive statistics indicate, Ayat Real Estate may benefit from further emphasis on risk transfer and potentially adopting a similarly comprehensive approach to risk response strategies.

Risk Monitoring and Control

PMI (2017) states risk monitoring and control involve tracking identified risks throughout the project lifecycle, implementing risk response plans, and assessing their effectiveness. It encompasses regular monitoring of project activities, performance metrics, and risk triggers to identify new risks, evaluate the progress of existing risk responses, and take corrective actions as necessary. In the context of real estate construction projects, risk monitoring and control play a crucial role in ensuring the timely identification and management of project risks to minimize their impact on project objectives.

Implementing risk monitoring and control in real estate construction projects is essential for proactive risk management and project success. By continuously monitoring project risks, assessing risk response effectiveness, and taking corrective actions as needed, real estate companies can mitigate potential threats, capitalize on opportunities, and enhance project outcomes while maintaining stakeholder confidence and compliance with regulatory requirements.

Table 10: Descriptive Statistics of Risk monitoring and control

	N	Frequencies					Mean	Std. Deviation	Variance
		1	2	3	4	5			
Regular monitoring of risk management process	80	2 (2.5%)	29 (36.3 %)	36 (45 %)	13 (16.3 %)	-	2.75	0.75	0.57
Periodic risk status reports and trends	80	5 (6.3%)	22 (27.5 %)	25 (31.3 %)	28 (35 %)	-	2.95	0.93	0.88
Issue logs tool	80	9 (11.3%)	28 (35 %)	23 (28.7 %)	20 (25 5)	-	2.67	0.97	0.95
Periodic evaluations	80	8 (10 %)	31 (38.8 %)	25 (31.3 %)	16 (20 %)	-	2.61	0.92	0.84
Periodic risk audits	80	42 (52.5%)	27 (33.8 %)	4 (5 %)	7 (8.8 %)	-	1.70	0.91	0.84
Valid N (listwise)	80								

(Source: own survey results April 2024)

In the provided SPSS output data related to risk monitoring and control, several variables have been measured and analyzed. The focus appears to be on assessing the efficiency and effectiveness of the risk management process and activities through various monitoring mechanisms. Below is an interpretation of the key findings based on the data presented:

1. **Regular Monitoring of Risk Management Process:** The mean value for this variable is 2.75, indicating that, on average, there is a moderate level of regular monitoring of the risk management process and activities to assess their efficiency and effectiveness.
2. **Periodic Risk Status Reports and Trends:** The mean value for this variable is 2.95, suggesting a slightly higher level of periodic reporting on risk status and trends compared to overall risk monitoring.
3. **Utilization of Issue Logs Tool:** The mean value for this variable is 2.67, indicating a moderate level of utilization of issue logs tools for tracking risks.
4. **Periodic Evaluations:** The mean value for this variable is 2.61, indicating that periodic evaluations are conducted at a moderate level within the sampled population.
5. **Periodic Risk Audits:** The mean value for this variable is 1.7, which suggests a lower frequency or perceived effectiveness of conducting periodic risk audits within the sample.

Overall, based on these findings, the average mean of the findings is approximately 2.53. This suggests that, on average, the level of monitoring and evaluation of risk management processes and activities within the real estate falls between moderate to moderately high. While some areas, such as periodic risk status reports and trends, show a moderately high level of utilization, others, like periodic risk audits, indicate a lower level of implementation. Overall, there appears to be a reasonable level of attention to monitoring risk management processes, although there may be room for improvement in certain areas, such as conducting formal risk audits to ensure comprehensive evaluation and enhancement of risk management practices.

Based on the study of Kalkidan (2017), the survey findings in Flintstone homes regarding the utilization of tools to monitor and review risk management effectiveness in projects reveal varying frequencies of usage. Periodic Risk Status Reports are infrequently utilized, with only 20% of respondents indicating their frequent use. Issue Logs see more usage, with 50% of respondents using them at least occasionally. Periodic Evaluations are the most commonly employed tool, with 60% of respondents utilizing them, albeit with some variability. However, Periodic Risk Audits are used the least, with only 30% of respondents employing them, indicating a potential area for improvement in assessing risk management effectiveness.

Overall, while periodic evaluation emerges as the most utilized tool, there's potential for enhancing the utilization of other monitoring and review mechanisms to ensure a comprehensive assessment of risk management practices.

While periodic evaluation emerges as the most utilized tool in both findings, there's a difference in the frequency of usage for other monitoring and review mechanisms. Inside Ayat Real Estate, as indicated by the descriptive statistics, shows a moderately-to-moderately high level of utilization across multiple tools, albeit with some areas for improvement, such as conducting formal risk audits. Flintstone homes, on the other hand, exhibit varying levels of utilization for different tools, with the potential for enhancing the usage of certain mechanisms to ensure a comprehensive assessment of risk management practices.

4.4.4. Difficulties in Management of Risks

The construction industry faces a myriad of challenges in implementing effective risk management practices due to its inherently complex and dynamic nature. One significant challenge is the inherent uncertainty and unpredictability associated with construction projects, stemming from factors such as changing regulations, evolving technologies, and unforeseen site conditions. These uncertainties make it difficult to accurately identify, assess, and mitigate risks, leading to potential project delays, cost overruns, and quality issues.

Additionally, the construction industry operates within a highly fragmented and competitive environment, often involving numerous stakeholders, including owners, contractors, subcontractors, architects, engineers, and regulatory agencies. Coordinating and aligning the interests of these diverse stakeholders can pose challenges in establishing clear lines of communication, responsibilities, and accountability for risk management practices throughout the project lifecycle. Moreover, construction projects are often subject to tight budgets and schedules, increasing the pressure to prioritize short-term objectives over long-term risk management strategies. This can lead to a reluctance to invest resources in proactive risk identification and mitigation efforts, leaving projects vulnerable to unforeseen disruptions and setbacks. Furthermore, the reliance on traditional risk management approaches, such as reactive problem-solving and reliance on past experiences, may not adequately address the increasingly complex and interconnected risks faced by the construction industry today.

Table 11: Descriptive Statistics of Difficulties in managing Risks

	N						Mean	Std. Deviation	Variance
		1	2	3	4	5			
Construction issues	80	5 (6.3 %)	34 (42.5 %)	20 (25 %)	21 (26.3)	-	2.71	0.93	0.86
Financial and Economic issues	80	45 (56.3 %)	35 (43.8 %)	-	-	-	1.43	0.49	0.24
Political and Legal issues	80	4 (5 %)	55 (68.8 %)	21 (26.3 %)	-	-	2.21	0.52	0.27
Valid N (listwise)	80								

(Source: own survey results April 2024)

The mean values provide insights into the average level of difficulties faced by the real estate across various categories. Here's the interpretation based on the mean values:

- 1. Construction Issues:** The mean score for difficulties related to construction issues is 2.71, indicating that these challenges are moderately present in the industry. This suggests that these challenges are commonly encountered but may not be overly severe on average.
- 2. Financial and Economic Issues:** The mean score for difficulties related to financial and economic issues is 1.44, indicating a lower level of perceived challenges compared to construction issues. This suggests that these challenges are less commonly faced or may not be perceived as significant compared to other categories.
- 3. Political and Legal Issues:** The mean here is 2.21, indicating a moderate level of difficulties related to political and legal issues. This suggests that while these challenges are not as prevalent as construction issues, they are still commonly encountered within the real estate sector.

Overall, the average mean of the findings is approximately 2.12. This suggests that, on average, the difficulties faced by the real estate fall within a moderate level across various categories.

Challenges related to construction issues, such as scarcity of labor and resources, design changes, and environmental effects, are perceived as the most prominent. Political and legal issues are also moderately encountered, while financial and economic issues are relatively less of a concern. However, the severity and impact of these challenges may vary depending on specific circumstances and contexts within the real estate sector.

Based on the study of Kalkidan (2022), the survey findings on Flintstone Homes highlight various difficulties related to construction projects, including construction issues, financial concerns, and political/legal obstacles. Notably, a significant proportion of respondents reported facing challenges related to construction issues, with 37.8% indicating that these challenges are well applied and 31.7% greatly applied. Financial issues also emerged as a major concern, with 34.1% reporting that these challenges are greatly applied and 36.6% indicating well application. Furthermore, political and legal challenges were identified, with 40.2% of respondents reporting some extent of application and 26.8% indicating well application. Interestingly, a notable 17.1% of respondents indicated the very great extent of application for challenges related to construction issues, suggesting a critical area of concern. Overall, these findings underscore the multifaceted nature of challenges faced in the construction industry, ranging from operational issues to financial constraints and regulatory hurdles, highlighting the need for comprehensive strategies to address and mitigate these challenges effectively. In contrast, Kalkidan's (2022) study on Flintstone homes highlights a more significant prevalence and severity of challenges related to construction projects. A notable proportion of respondents reported facing challenges related to construction issues, financial concerns, and political/legal obstacles. Specifically, challenges related to construction issues, financial issues, and political and legal challenges were reported by a substantial portion of respondents, indicating a high level of application and severity. The findings suggest that challenges related to construction issues, in particular, are critical and require urgent attention.

Overall, while both findings underscore the multifaceted nature of difficulties faced in the construction industry, Kalkidan's study emphasizes a higher prevalence and severity of challenges, ranging from operational issues to financial constraints and regulatory hurdles. This highlights the need for comprehensive strategies to address and mitigate these difficulties effectively within the construction sector, suggesting a more urgent need for action and intervention compared to Ayat real estate's challenges.

4.5. Benefits of having a Risk Management Plan

Some potential benefits of having a risk management plan, as reported by questionnaire respondents:

1. Improved decision-making: Respondents mentioned that having a risk management plan in place helps in making more informed decisions by identifying potential risks and their likelihood of occurrence.
2. Minimized financial losses: According to the respondents, having a risk management plan will help reduce financial losses by implementing proactive measures to mitigate risks and prepare for potential crises.
3. Enhance organizational resilience: Respondents highlighted that a risk management plan can enhance the overall resilience of real estate by identifying vulnerabilities and implementing strategies to address them.
4. Increased stakeholder confidence: Having a robust risk management plan can instill confidence in stakeholders, including investors, home buyers, and employees, by demonstrating that the real estate is proactive in managing risks.
5. Compliance with regulations: Respondents noted that a risk management plan can help ensure compliance with various government regulatory requirements by identifying and addressing potential compliance risks.

According to the respondents, having a risk management plan adds value to a project as it helps in identifying potential risks and coming up with strategies to mitigate them. It allows for proactive decision-making and minimizes the impact of unforeseen events, thus increasing the overall chances of project success. Additionally, having a risk management plan instills confidence in stakeholders and enhances project governance. When the respondents were asked to describe the benefits of the risk management plan the majority of their responses included the reduction of project cost and time by helping avoid pitfalls that might occur during the project that affect these factors; helping to identify and manage project risks; provide better quality data for decision making; helps provide a framework to deal with project risks and helps form consistent and efficient work operation.

Respondents emphasized that having a risk management plan is crucial for organizations to effectively anticipate, assess, and respond to risks, ultimately leading to improved outcomes and organizational success.

Based on the information gathered by the researcher, a risk management plan does have a significant impact on the success and failure of a project. The success of a project heavily relies on the ability to effectively identify, assess, monitor, and mitigate risks throughout the project lifecycle. A well-developed risk management plan enables project teams to proactively address potential issues before they escalate into major problems, ultimately reducing the likelihood of project failures.

On the other hand, the absence of a risk management plan or a poorly executed plan can lead to increased project vulnerabilities, unanticipated obstacles, budget overruns, schedule delays, and ultimately project failure. Ignoring or neglecting risks can result in a lack of contingency plans and strategies to address unexpected events, leading to project derailment and failure.

Therefore, project managers must invest time and resources in developing and implementing a comprehensive risk management plan to enhance project success and reduce the likelihood of failures. By staying proactive and prepared for potential risks, project teams can minimize uncertainties, optimize decision-making, and increase the chances of achieving project objectives within scope, schedule, and budget constraints.

4.6. Difficulties Caused by Poor Risk Management Practice

Based on the information gathered from respondents the researcher discussed problems caused by poor risk management. The respondents mentioned frequently time delays, budget escalation, unsatisfied stakeholders, and project failure. Therefore, poor risk management practices put the project in a critical situation and the worst-case scenario may cost the project itself. The respondents experienced firsthand the difficulties caused by poor risk management practices. Some of the key challenges include:

1. **Uncertainty and unpredictability:** When risks are not properly identified and managed, it becomes difficult to predict potential issues that may arise during the project. This can lead to delays, cost overruns, and even project failure.
2. **Lack of contingency planning:** Poor risk management often results in a lack of contingency plans in place. This means that when unexpected events occur, there is no predefined course of action to mitigate the impact, resulting in chaos and reactive decision-making.
3. **Stakeholder dissatisfaction:** Inadequate risk management can lead to stakeholder dissatisfaction, as they may feel that their needs and concerns are

not being adequately addressed. This can negatively impact relationships and overall project success.

4. **Loss of reputation:** Poor risk management can damage the reputation of both the project team and the real estate as a whole. Failed projects and constant issues can erode trust and credibility in the eyes of stakeholders and clients.

Overall, real estate must prioritize effective risk management practices to minimize the impact of uncertainties and ensure successful construction project outcomes. From the survey, one can conclude that the consequences of poor risk management are significant. They can lead to project delays, budget overruns, compromised quality, stakeholder dissatisfaction, legal and regulatory issues, and damage to the organization's reputation. Investing in a robust risk management plan and implementing effective practices is crucial for mitigating these risks and ensuring project success.

4.7. Risk Management Software and Tools

Risk management software and tools are essential for organizations to effectively manage risks in complex projects like the CCE mall apartment construction project. They provide a structured framework for identifying, assessing, prioritizing, mitigating, and monitoring risks throughout the project lifecycle. Based on the responders, inside Ayat Real Estate, few management software and tools are utilized to enhance risk management practices. Some of the commonly used software and tools include:

1. **Risk Management Software:** There are various risk management software solutions mentioned by responders that are used in the real estate. This software helps in identifying, assessing, and mitigating risks related to construction projects. Commonly used software is Procore and Microsoft Project which offer basic risk identification and tracking functionality. It enables construction professionals to identify, assess, and track project risks in real time, facilitating proactive decision-making and risk mitigation strategies.
2. **Tools** - Various tools are commonly used to enhance risk management practices in Ayat Real Estate. Some of the most common tools include risk registers (spreadsheets or databases for documenting identified risks, their details, and associated mitigation strategies), SWOT analysis (a framework for identifying

strengths, weaknesses, opportunities, and threats related to a project), Monte Carlo Simulation (statistical models to estimate the impact of uncertainties on project outcomes), risk workshops, Decision Trees (visual tools to analyze potential decision paths and their associated risks), and Earned Value Management (EVM). According to the responders, these tools help them to systematically identify, assess, and prioritize risks, as well as develop effective mitigation strategies.

Overall, based on the survey, the use of these software and tools in the real estate industry enhances risk management practices by streamlining processes, improving data accuracy, and providing valuable insights for better decision-making. They are indispensable assets for organizations that want to proactively manage risks and enhance project success. They provide a structured framework, improve accuracy and efficiency, facilitate collaboration, and support data-driven decision-making. By carefully selecting the right software and tools, organizations can effectively manage risks, reduce uncertainties, and build a foundation for project success.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Introduction

This section is an essential part of the research paper. It is the last impression the researcher leaves in the mind of the reader. In this chapter research findings, conclusions derived from the data analysis, and recommendations suggested based on the research result to help improve the risk management practice of Ayat Real Estate Company will be provided.

5.2. Summary of the major findings

Based on the data analysis and by research question the following findings are summarized.

Data analysis on risk and risk management awareness and perception

The analysis revealed a moderate awareness of risk within Ayat Real Estate. The real estate provides some employee training and has defined risk management processes, but clearer guidelines for unexpected risks and consistent risk information communication are needed.

Data analysis on risk management plan

The analysis revealed a moderate risk management plan effectiveness: A plan exists, but greater stakeholder involvement, more effective use of historical data, and a Risk Breakdown Structure (RBS) would enhance its robustness.

Data analysis on risk planning

The data gathered shows moderate risk planning. The company engages in risk planning meetings and creates contingency plans, but there's room for improvement in proactively identifying and mitigating emerging trends.

Data analysis on risk identification

The research conducted focused on evaluating the risk identification processes and tools utilized by the real estate company. It shows moderate risk identification: Tools and processes exist, but brainstorming sessions and consistent involvement of key participants should be prioritized.

Data analysis on risk analysis

The analysis showed moderate risk analysis: Ayat Real Estate utilizes both qualitative and quantitative risk analysis, but a focus on enhancing quantitative analysis methods is crucial for accurate contingency reserve determination

Data analysis on risk response strategies

The analysis revealed a moderate risk response strategy: The company uses various strategies, but stronger contingency planning, consistent personnel assignment, and refined time/cost allocation within contingency plans are needed.

Analysis of risk monitoring and control

The data gathered shows moderate risk monitoring and control: The company monitors risk management processes and uses tools, but further enhancing the use of tools such as periodic risk audits is recommended.

Analysis of difficulties in risk management practices

The descriptive statistics provided for difficulties of risk management practices in Ayat real estate indicate a moderate level of challenges faced by the real estate, spanning construction, political, and legal domains. Construction issues are prominent, alongside moderately encountered political and legal challenges. Financial concerns rank relatively lower in severity. However, the impact of these challenges varies based on specific contexts within the real estate.

The benefits of a Risk Management Plan are Well-Recognized: Respondents highlighted the value of a risk management plan in improving decision-making, reducing costs and delays, enhancing project quality, increasing stakeholder confidence, and promoting organizational resilience.

Overall, the study suggests that Ayat Real Estate has made progress in establishing risk management practices but has opportunities to enhance its approach to achieve greater effectiveness and resilience in managing project risks.

5.3. Conclusion

Risk management practices of Ayat Real Estate have been analyzed in the study and to sum up the works, the following conclusions have been reached.

Based on the descriptive statistics gathered, it can be concluded that the real estate organization does provide some level of training and awareness programs for its employees regarding risk management. However, there are areas where improvements can be made to enhance the overall risk management practices within the company. These include establishing clear guidelines for managing unexpected risks, assigning specific responsibilities for handling risks when they occur and ensuring consistent communication of risk information across all projects and departments.

Based on the analysis of the data collected, it can be concluded that while the real estate does have a risk management plan in place, there are opportunities for enhancement. Stakeholder involvement in developing the plan could be increased to ensure a more comprehensive approach to risk management. Additionally, leveraging previous data more effectively and incorporating a Risk Breakdown Structure (RBS) to define risk categories could lead to a more robust risk management framework.

The findings suggest that Ayat Real Estate demonstrates a moderate level of engagement in risk planning practices. While the company has established some mechanisms for identifying and considering potential risks during the planning process, there are opportunities for enhancement to ensure a more comprehensive and proactive approach.

Based on the findings of the research, it can be concluded that the real estate company under study has established mechanisms for identifying and managing project risks. The utilization of tools such as brainstorming sessions, risk checklists, expert judgment, risk registry, and involving key project participants in risk identification indicates a structured approach towards risk management.

Based on the descriptive statistics provided in the research findings Ayat Real Estate does have established qualitative risk analysis methods and tools, There is a process in place to quantify risks, cause-and-effect risk analysis is conducted, a contingency plan for risk analysis exists, the probability of achieving specific project objectives is assessed, risks requiring attention are identified through quantification of their contribution to overall project risk management, A risk matrix defining probability and impact is utilized.

Based on the descriptive statistics provided for each risk response strategy in Ayat real estate, it can be concluded that there are measures in place to address risks effectively. The data indicates that a combination of risk transfer techniques, acceptance/retention strategies, and risk reduction methods are utilized to manage risks within acceptable thresholds.

Based on the descriptive statistics presented, it is evident that the risk management process and activities are being regularly monitored to determine their efficiency and effectiveness. The mean values for the various monitoring methods are relatively close to each other, indicating a consistent level of attention given to risk monitoring and control across different tools and processes.

Based on the descriptive statistics presented, it is evident that Ayat real estate indeed faces difficulties related to construction issues, financial/economic factors, and political/legal issues. The data shows that construction-related challenges have a higher mean value compared to financial/economic and political/legal challenges, indicating a more significant impact on risk management practices in the real estate.

Based on the open-ended survey responses, respondents overwhelmingly emphasized the importance of having a well-defined risk management plan. risks, companies could significantly reduce the likelihood of project failures.

The survey also revealed the downside of poor risk management. Several respondents shared stories of projects plagued by delays, budget overruns, and unhappy stakeholders. Interestingly, some participants mentioned the innovative approach taken by Ayat Real Estate. They integrate various software solutions like risk management software, property, and data analytics to enhance their risk management practices. The use of Artificial Intelligence (AI) in construction project risk management was another emerging trend mentioned by a few respondents. They believe AI can revolutionize decision-making, improve safety measures, and increase project efficiency, ultimately leading to better overall project outcomes.

In conclusion, the voices from the field paint a clear picture: Effective risk management is essential for success in construction projects. Companies that prioritize identifying and mitigating potential risks are more likely to experience positive outcomes, satisfied stakeholders, and a strong reputation in the industry. All in all, it can be concluded that risk management is moderately practiced in Ayat Real Estate construction projects.

5.4. Recommendation

Based on the summary and conclusion of this research, the following recommendations are made. Believing that these recommendations will take real estate companies a step forward concerning risk management practices.

- ❖ The real estate organization should consider enhancing its training programs to further raise employee awareness towards risk management. This could include specialized workshops or seminars focusing on identifying and addressing different types of risks. It is also recommended that the company should develop a comprehensive guideline that outlines how to manage unexpected risks effectively. To ensure better risk management practices, the company needs to establish a system where risk information is consistently communicated and shared across all projects and departments.
- ❖ The real estate is advised to consider involving stakeholders more actively in the development of the risk management plan to gather diverse perspectives and insights that can lead to a more comprehensive approach. It is recommended that the real estate should utilize historical data more effectively to identify trends, patterns, and potential risks that can inform future risk management strategies. Developing a Risk Breakdown Structure (RBS) to categorize risks systematically can help in identifying, assessing, and managing risks more efficiently.
- ❖ To maximize the benefits of risk management practices for the real estate, consider implementing a formalized risk management framework that incorporates best practices from industry experts such as PMI or ISO 31000 Risk Management Principles & Guidelines. Regularly reviewing the company's risk assessment processes can also help ensure that you remain responsive to emerging trends and threats in the construction industry or market sector.
- ❖ Provide training sessions to key project participants on effective risk identification techniques and tools to improve their understanding and contribution to the process. Implement a system for regular review and update of the risk identification processes to ensure alignment with changing project dynamics and emerging risks. Explore the integration of technology-driven solutions such as risk management software or digital platforms to streamline and enhance the efficiency of risk identification procedures.

- ❖ To further enhance the risk analysis practices in the real estate, it is recommended that: Continuous improvement in qualitative risk analysis methods should be pursued to adapt to changing market dynamics. Regular review and updating of the contingency plan for risk analysis are essential to address emerging risks promptly. Training programs on cause-and-effect risk analysis should be provided to enhance understanding among stakeholders. Quantitative risk analysis should also be considered to numerically determine the size of cost and schedule contingency reserves that may be needed if risks occur.
- ❖ To further enhance the effectiveness of risk response strategies in the real estate sector, it is recommended to continuously review and update these strategies based on changing market conditions and emerging risks. Regular training and awareness programs should be conducted for personnel responsible for managing risks. Moreover, conducting periodic evaluations of stakeholder satisfaction and feedback can help in identifying areas for improvement and ensuring alignment with stakeholders' expectations.
- ❖ To further enhance the efficiency and effectiveness of risk monitoring and control, it is recommended to continue the current practice of regular monitoring through tools like periodic risk status reports, issue logs tool, periodic evaluations, and periodic risk audits. Additionally, organizations may consider implementing more advanced data analytics techniques to gain deeper insights into potential risks and improve decision-making in risk management processes.
- ❖ To address risk practice challenges effectively, real estate professionals should focus on implementing robust risk management strategies that specifically target issues related to construction such as labor shortages, resource scarcity, design changes, and environmental impacts. Additionally, proactive measures should be taken to mitigate financial risks stemming from price fluctuations and inflation as well as political and legal risks to enhance overall risk management practices within the real estate.

- ❖ It is also recommended to develop a communication strategy to ensure that all stakeholders, including project teams, investors, clients, and regulatory agencies, are informed about project risks, mitigation strategies, and progress updates.
- ❖ To enhance the real estate's risk management practice, it is recommended that real estate companies should consider incorporating Artificial Intelligence (AI) into their risk management practices for their projects. AI has the potential to revolutionize decision-making, enhance safety measures, and increase overall project efficiency. By utilizing predictive analytics, AI can help identify potential risks, suggest preventive measures, and optimize resource allocation.
- ❖ By implementing these recommendations, real estate companies can strengthen their risk management strategies and improve overall project outcomes.

5.5. Recommendation to Future Researchers

1. Focus on Real-World Case Studies: It is recommended that future researchers focus on real-world case studies to assess project risk management practices in construction projects. By analyzing actual projects, researchers can gain valuable insights into the challenges faced, strategies employed, and outcomes achieved in managing risks effectively.

2. Collaborate with Industry Professionals: Collaborating with industry professionals such as project managers, contractors, and risk management experts can provide valuable practical insights into project risk management practices. Engaging with practitioners can help bridge the gap between theory and practice and ensure that research findings are relevant and applicable to real-world scenarios.

3. Consider Cultural and Contextual Factors: Future researchers should also consider cultural and contextual factors that may influence project risk management practices in different regions or countries. Understanding how cultural norms, regulatory frameworks, and socio-economic conditions impact risk management strategies is crucial for developing context-specific recommendations.

By following these recommendations, future researchers can make meaningful contributions to the field of project risk management in construction projects and help improve the overall success rate of construction projects worldwide.

Furthermore, the research was conducted with a focus solely on Ayat Real Estate CCE mall apartment construction projects. Thus, it only shows a snapshot of the risks and risk management practices of this specific real estate. As the scope of the study is limited to only these projects, it is difficult to generalize this to every real estate project in the country; therefore, there is a need for a more comprehensive and detailed study in the area for a better understanding of risk management practice in the real estate industry.

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Appendix

Survey questionnaires

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

POSTGRADUATE PROGRAM

Dear participant;

My name is Mikiyas Abrham, a student of project management at Addis Ababa University School of Commerce. As part and parcel of my MA in project management, I am currently working on research entitled “Project Risk Management Practices in Construction Projects: A Case Study of Ayat Real Estate”.

I believe your experience and educational background will greatly contribute to the success of my research. So it is with great respect that I ask you for a little of your time to fill out this questionnaire. And, I hereby assure you that all the information will remain confidential and do not include your name in the questionnaire.

I sincerely request you to respond to the questions as per the actual project’s perspective, not in the general perspective. You are also requested to answer & fill out the questionnaire accurately & truthfully. Your response is highly valuable and contributes to the outcome of the research.

Thank you!

Best regards!

Mikiyas Abrham

If you have any hesitation or questions, my contact information is given below.

Tel: +251913645830 Email: Mikeabrham1@gmail.com

Addis Ababa, Ethiopia

General Instruction and Information

Dear participant, this questionnaire booklet has three parts: part one – includes questions about general information of the respondent, part two - has opinion-related rank questions regarding basic information about risk management, and Part three - comprises open-ended questions about the risk management survey.

PART ONE: Personal information

Please choose and tick (✓) the multiple-choice questions

1. Sex

Male [] Female []

2. Age

20-30 [] 31-40 [] 41-50 [] Above 51 []

3. Level of education]

PHD [] MA(MSc.) [] BSc. [] Diploma [] Certificate []

Other []

4. Your position in the company

Project manager []

Project Engineer []

Members of the project implementation team []

Risk officer []

Risk auditor []

5. Working experience

Below 5 years []

Between 5 and 10 years []

Between 11 and 15 years []

Between 16 and 20 years []

PART TWO: Employees' related questions about the risk management practice of Ayat Real State

The following statements are presented on five points scale to gather information about awareness, practices, challenges, tools, and techniques/strategies of risk management applied to Ayat Real Estate's CCE mall apartment construction projects. Please kindly indicate the extent to which the following project risk management awareness, practices, challenges, and strategies are applicable within Ayat Real Estate.

Choose from the five points stated below and mark with [√] against the most applicable response. The researcher may use the above five points as rank when necessary as they ranked.

1. Not applied
2. Applied to some extent
3. Well applied
4. Greatly applied and
5. Applied to a very great extent

1	Questions on risk and risk management awareness and perception	5	4	3	2	1
A	Training programs for risk awareness					
B	Defined risk management process					
C	Guideline for managing unexpected risks					
D	Assignment of responsibilities to handle risks					
E	Communication of risk information					
2	Information about the risk management plan	5	4	3	2	1

A	Effective and efficient risk management plan					
B	Stakeholders' involvement					
C	Use previous data to develop a risk management plan					
D	Use of Risk Breakdown Structure (RBS)					
E	Inclusion of resources and cost estimation					
F	Risk management activities defined and included in the schedule					
3	Risk management practices					
3.1	Risk planning	5	4	3	2	1
A	Considering risks strategic planning					
B	Updating policies and guidelines					

C	Considering emerging trends					
D	Pre-risk management planning meetings					
E	Create a contingency plan					
F	Stakeholder involvement in risk management planning					
G	Consideration of risks due to environmental factors					
3.1	Risk identification	5	4	3	2	1
A	Processes or tools					
B	Have a brainstorming session					
C	Use of risk checklists					
D	Have a risk registry					
E	Use expert judgment for identified risks					
F	Experience and review of risk identification					
G	Involvement of key participants					
H	Categorization of identifies risks					

3.2	Risk analysis	5	4	3	2	1
A	Qualitative risk analysis					
B	Quantitative risk analysis					
C	Cause-and-effect risk analysis					
D	Contingency plan for risk analysis					
E	Assessing of probability					
F	Identification of risks requiring attention					
G	Presence of a risk matrix					
3.3	Risk response strategies	5	4	3	2	1
A	Techniques of risk responses in place					
B	Use Risk avoidance technique					
C	Contingency planning					
D	Risk Transfer techniques to a third party					
E	Risk acceptance/retention					
F	Reduce risk to an acceptable threshold level					
G	Combination of risk responses					
H	Personnel assigned for each agreed risk response					
I	Contingency plan allocated for time					
J	Contingency plan allocated for cost					

K	Stakeholders' satisfaction with risk response strategies					
3.4	Risk monitoring and control	5	4	3	2	1
A	Regular monitoring of risk management process					
B	How often does the real estate use the following tools to monitor and review risk management effectiveness?					
	Periodic risk status reports and trends					
	Issue logs					
	Periodic evaluations					
	Periodic risk audits					
4	Difficulties in the management of risks	5	4	3	2	1
A	Challenges relate to construction issues					
B	Challenges relate to financial and economic issues					
C	Challenges relate to political and legal issues					

PART THREE: Short answer questions

1. What are the benefits of implementing a comprehensive risk management plan in construction projects?

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2. Describe the difficulties that can arise from poor risk management practices in construction projects. Be specific about the negative consequences for the project and its stakeholders.

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3. Discuss the use of risk management software and tools commonly employed in the real estate industry to enhance risk management practices. Provide examples of specific software and tools and explain how they contribute to improved risk management

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