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ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

**“ANALYSING THE CONTRIBUTION OF PROJECT MANAGEMENT
PRINCIPLES IN BUILDING CONSTRUCTION PROJECTS: A STUDY OF
ADDIS ABABA**

BY:

HANI MERIED

**A Project Submitted to the School of Graduate Studies in Partial
Fulfilment of The Requirements for The Degree of Master of Arts**

In Project Management

Advisor:

Mengistu B. (Ph.D.)

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Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
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In

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I, the undersigned, certify that this project work titled as “**Analyzing the Necessity of Project Management Principles in Building Construction Projects: A Study of Addis Ababa**” is my original work performed under the supervision of my project advisor **Dr. Mengistu B.** and has not been presented elsewhere for assessment or a degree in any other university. All sources of material used for this thesis has been duly acknowledged.

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I would not have been here if it were not the will of God, which I am indisputably grateful for. My parents care and support has always been there, where ever I go and to what I am always committed to. I am also grateful for those key personnel who helped me in giving their quick response while I collect data to this project. I would also like to thank my research advisor for his insightful advises in this research.

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Abstract

The building construction industry in Addis Ababa has been growing rapidly, and with this growth comes the need for effective project management principles. This research project aims to identify the major problems in building construction projects in Addis Ababa, assess the extent to which project management is adhered to in these projects and the ways to customize project management principles to specific construction environment for improved project outcome. Through a mixed research methodology, a data was collected from 70 participants through a questionnaire and 10 project managers through interviews. The quantitative analysis revealed that while most respondents believe project management principles are important and adhered to in building construction projects, there are still some challenges in their implementation. The qualitative analysis identified several problems in building construction projects, including a lack of up-to-date knowledge in the industry, unwillingness of stakeholders to abide by regulatory standards, loose watch of regulatory bodies, a shortage of skilled manpower, and unpredictable socio-economic changes. Based on the findings of this research, it is clear that project management principles are necessary in building construction projects in Addis Ababa. However, the challenges in their implementation must be addressed and has to be customized in order to suit specific project condition. The research suggests that stakeholders must have access to up-to-date knowledge in the industry and be willing to adhere to regulatory standards. Regulatory bodies must also play an active role in ensuring compliance with standards, and efforts should be made to overcome the shortage of skilled manpower. Additionally, customizing project management principles to suit specific construction environments could improve project outcome. By addressing these challenges, the building construction industry in Addis Ababa can benefit from more effective project management principles and better project outcomes.

Key Words *Building, Construction Industry, Project, Management, Principles, Contribution, Challenges, Customize, Adhere*

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List of Abbreviations and Acronyms

PMI- Project management institute

JIT- Just in time

CPM- Critical path method

GDP- Gross domestic product

PERT- Progress evaluation and review technique

SPSS- Statistical package for social sciences

BIM- Building Information Modeling

WBS – Work Break Down Structure

CHAPTER ONE: INTRODUCTION

This chapter includes Background of the study, the problem statement, research questions, research objectives, Significance and potential contribution of the study, scope of the study, limitation of the study and definition of key terms used in the study paper.

1.1 Background of the study

Construction projects involve a wide range of stakeholders, including architects, engineers, contractors, sub-contractors, material suppliers, government agencies, clients and many more. Coordinating such a diverse group of people with different skill and interests can be challenging, requiring effective project management strategies. Project quality, time overrun, and cost rise is challenging the economic and construction industry development of many countries. Researches show that, Yimam (2011) in Ethiopia many construction projects are suffering with different problems such as delay, cost overrun and quality issues. Therefore, implementing project management principles is crucial to ensuring the success of construction projects.

Addis Ababa, the capital city of Ethiopia, is a rapidly growing metropolitan area with an increasing demand for infrastructure and construction projects. The city has undergone significant urbanization in recent years, leading to the construction of numerous buildings and transportation networks. These projects often face quality problems, delays and cost overruns due to poor planning and ineffective execution. These problems the construction industry face may be attributed to different factors due to the involvement of large resources for common objectives and goals. These same problems faced in these projects can be resolved with the application of project management and its principles in every step of the project phases.

Project management principles provide project managers with a set of guidelines and concepts that help them make informed decisions throughout the project lifecycle. In turn the project management knowledge can be linked to these problems providing project mangers the ability to increase the likelihood of project success, improve project outcomes, and enhance stakeholder satisfaction. These principles provide a framework for project managers to approach their projects systematically, minimize risks, and overcome challenges.

The scope of the research work involves conducting a thorough analysis of the current building construction industry in the city of Addis Ababa, Ethiopia. The project aims to investigate if project management principles in building construction projects is implemented or not and its benefit towards project goal.

The research also encompasses a comprehensive literature review and analysis of collected data to draw conclusions and make recommendations for the building construction industry stakeholders in Addis Ababa.

Project management principles are essential in enhancing successful construction projects. Construction projects are characterized by multiple phases, including initiating, planning, implementation, monitoring and evaluation and close out, which require close attention to time, cost, and quality. The application of project management principles such as risk management, communication, and resource allocation can assist construction managers to achieve project objectives on time, within the budget, and to meet stakeholders' expectations (Mukithur Rahman & Alamin Mohammed, 2017). Additionally, these project management principles have the potential to enhance accountability through clear task delegation and tracking the progress of each team member towards achieving project goals.

In the context of Addis Ababa, Ethiopia, where infrastructure development is on the rise, it is necessary to analyze the role of project management principles in building construction projects. According to a study on Infrastructure Development in Ethiopia, poor project management has been identified as one of the biggest contributing factors to project delays, increased costs, and low-quality output (Teshome et al., 2020).

Essential project management principles can play a crucial role in preventing cost overruns, delays, and poor quality in projects. By implementing effective planning, scheduling, risk management, and communication strategies, project managers can ensure that projects are completed on time, within budget, and to the required quality standards.

One study that highlights the importance of project management principles in preventing cost overruns is "A Study of Cost Overrun in Construction Projects" by Odeyinka et al. (2012). The study found that effective project management practices such as risk management, stakeholder engagement, and project control were essential in preventing cost overruns in construction projects.

Another study that emphasizes the role of project management in preventing project delays is "The Impact of Project Management on Project Success: The Case of Time Performance" by Koushki et al. (2005). The study found that effective project management practices such as project planning, scheduling, monitoring, and control were essential in ensuring timely completion of projects.

1.2 Problem Statement

Project management is increasingly becoming more significant in various sectors of the economy, including building construction projects. However, there is a gap in the understanding and execution of the extent to which project management principles are necessary for the success of building construction projects.

Theoretical literatures have highlighted the importance of project management in enhancing performance and ensuring that projects are completed on time, within budget, and to the expected quality. However, previous studies in the construction industry have not effectively investigated these principles to understand their Contribution in building construction projects in Addis Ababa, Ethiopia. Therefore, this research work aims to bridge this knowledge gap by exploring the theoretical underpinnings of project management principles and their significance along with their Contribution in construction projects.

The building construction industry experiences various challenges that lead to cost overruns, delays and low-quality outputs due to inadequate application of project management principles. Several factors may contribute to these problems, including inadequate skills and less structured project management systems in place.

These problems have resulted in stalled or failed construction projects impacting the development of infrastructure and related socio-economic benefits. Therefore, there is a practical problem of clarifying the necessity of project management principles in building construction projects and ensuring its adherence in building construction projects in Addis Ababa, Ethiopia. This research work seeks to explore this practical issue in-depth through empirical research on the experiences of building construction professionals and project managers in Addis Ababa.

This research will aim to generate practical recommendations that can help enhance the adoption of effective project management principles in different projects.

Building construction projects are notoriously difficult to manage, with a high rate of project failures, delays and cost overruns. While project management principles have been widely recognized as a tool to improve efficiency, research suggests that there are several challenges in implementing these principles in construction projects.

Several studies have explored the challenges of implementing project management principles in building construction projects. For instance, a study by Faniran et al. (2006) found that the lack of project planning, management skills, and communication among stakeholders contributed to the failure of construction projects in Nigeria. Similarly, Abdou and Odeh (2011) identified the fragmentation of the building construction industry and the absence of a unified approach to project management as a significant barrier to implementing project management principles in the United Arab Emirates.

These findings highlight the need for a comprehensive and integrated approach to project management in the building construction industry, which takes into account the diverse interests and perspectives of stakeholders involved in the project.

One of the key knowledge gaps in implementing project management principles in building construction projects is the lack of understanding and integration of building information modeling (BIM) into project management processes. **BIM** is a digital representation of the physical and functional characteristics of a building or infrastructure project, and it has the potential to enhance communication, collaboration, and coordination among project stakeholders. However, research suggests that there is limited integration of BIM into project management processes in building construction projects, which can lead to inefficiencies, errors, delays, and cost overruns (Mkaouar et al., 2020; Ahmed et al., 2019). Therefore, there is a need for more research on how to effectively integrate BIM into project management processes to improve project outcomes.

Another knowledge gap in implementing project management principles in building construction projects is the limited use of agile methodologies. Agile approaches are characterized by adaptive planning, iterative development, customer involvement, and flexibility, and they are increasingly being used in software development and other industries to manage complex and uncertain projects.

However, research suggests that there is limited adoption and adaptation of agile methodologies in building construction projects, which can hinder project performance and competitiveness (Elshaer et al., 2019; Mir et al., 2018). Therefore, there is a need for more research on how to effectively apply agile methodologies in construction projects to improve project agility, responsiveness, and innovation.

Despite a clear potential of being an important tool to the economy, the level of attention given to project management in the Ethiopian economy is so minimal, and if any traditional (Tigabu A. 2022)

1.3 Research Questions

1.3.1 General Research Questions

To what extent are project management principles applied in building construction projects within Addis Ababa?

1.3.2 Specific Research Questions

The project work sets its quest by raising important questions that will be answered at the end of the analysis from the collected data and conclusion. These are the specific ones:

- 1) What are the most common challenges faced by building construction projects in Addis Ababa that can be dealt by applying project management principles?
- 2) To what extent do building construction projects in Addis Ababa adhere to project management principles to ensure successful project completion?
- 3) How can project management principles be customized or adapted to suit the specific needs and context of building construction projects in Addis Ababa?

1.4. Research Objective

1.4.1 General Objectives

To investigate and assess the current practices of project management principles in building construction projects in Addis Ababa, identify the challenges in the implementing project management principles, and determine the extent to which the application of project management principles is necessary for successful project implementation.

1.4.2 Specific Objectives

- 1) To identify the major problems in building construction projects in Addis Ababa and what project management principles can address these problems.
- 2) To assess the extent of the use of project management principles by stakeholders involved in building construction projects in Addis Ababa and examine their contribution to the successful completion of projects.
- 3) To explore and analyze the challenges faced by construction teams when implementing project management principles in Addis Ababa, and develop recommendations for addressing these challenges and the ways to customize project management principles to suit specific construction environment to improve project outcomes

1.5. Significance and Importance of the study

This research works on analyzing the Contribution of project management principles in building construction projects will help to identify the importance and relevance of project management principles in the building construction industry and the extent those principles are adhered to specifically in Addis Ababa, Ethiopia. The research will delve into the current practices, problems faced by the building construction industry, and how project management principles can address such problems.

For professionals in the building construction industry, such research can bring significant value as it offers insights into the current trend of project management principles in building construction projects.

Understanding the effectiveness of project management principles in Addis Ababa will enable building construction companies to identify areas where they need to improve their project management practices.

This research can also provide recommendations for implementing best practices in building construction project management in Addis Ababa based on well acknowledged standards and their adoptive ways that can fit the existing building construction environment of Addis Ababa. Moreover, stakeholders taking part in the industry, such as policymakers, investors, and regulatory authorities, can leverage the findings of this study to make informed decisions about improving the building construction sector's efficiency and effectiveness.

Moreover, this research will give concerned government agencies an insight on the current perception of project management principles in building construction projects. Successful completion of projects will greatly benefit the socio-economy state of a country, therefore government agencies and regulatory authorities in the building construction industry can use such researches as a data source to devise new working culture that suit the specific environment or for further investigation.

1.6 Scope of the research

The research explores major problems faced in the building construction industry, the extent to which project management principles have been implemented in ongoing building construction projects in Addis Ababa, identify the gaps, challenges, and possibility of adapting project management standards to a specific construction industry.

The building construction industry in Addis Ababa is rapidly expanding, which makes project management principles a vital aspect for the successful execution of these construction projects. The necessity of incorporating project management principles in building construction projects cannot be overstated as it helps to ensure that projects are delivered on time, within budget and meet design specifications. Thus, a study of the trends of project management principles within the context of construction projects in Addis Ababa could be a relevant and significant scope of study.

The research analyzes the various project management principles deployed such as planning, scheduling, resource allocation, and risk management in the building construction projects which are considered to be high rise and ongoing at the time of the study.

It also examines how often these project management principles are applied in Addis Ababa's building construction industry, the extent to which they are utilized, and their effectiveness in ensuring project success.

Furthermore, the research provides an insight into the significance of the role of human factors and technical expertise in the successful implementation of project management principles in construction projects in Addis Ababa. This research provides valuable information to construction firms and stakeholder, enabling them to make informed decisions when planning and executing construction projects.

1.7. Limitations of the study

The study could possibly face the following limitations while in the different parts of its execution.

- 1) Time Constraints: There may be limited time available to collect and analyze data related to the study.
- 2) Availability of data: It might be challenging to access some relevant data related to construction projects and their management practices due to confidentiality.
- 3) Reliance on self-reported responses: The accuracy and completeness of self-reported information from stakeholders such as project managers, contractors, architects, and other.

1.8 Organization of the study

1. Chapter One: - (Introduction) Background of the study, problem statement, significance of the study, research questions, research objectives, scope of the study, limitation of the study and definition of key terms used in the study paper.

2. Chapter Two: - (Literature Review) Discussion of project management principles and their significance in construction projects, Critical analysis of existing literature about project management in construction projects specifically in Addis Ababa, Identification of gaps and limitations in previous researches.

3. Chapter Three: - (Research Methodology) Explanation of the research design and methodology used, description of the sampling technique, sample size, data collection methods, and data analysis technique, Discussion of ethical considerations

4. Chapter Four: - (Data analysis and interpretation) Presentation and analysis of data collected, evidence to support or reject research questions, Comparison with previous studies to identify similarities and differences.

5. Chapter Five: - (Summary, Conclusion and Recommendation) Discussion of the implications of the study's results, Conclusions drawn from the study, Recommendations for practitioners and future research directions based on the findings, Limitations of the study and suggestions for future research.

References - a list of sources used throughout the research work.

Appendices – a list of questionnaire and interview format and introduction letters

1.9 Definition of key terms

Project Management Principles- A set of guidelines, frameworks, and techniques used to manage projects effectively and efficiently (PMI,2017).

Construction Projects- Any kind of project that involves building, remodeling, or otherwise improving a physical structure or infrastructure (ASCE, 2017, p. 2).

Involvement - the act or state of participating or taking part in something (Merriam-Webster, n.d.).

Risk Management -the process of identifying, assessing, and prioritizing risks followed by coordinated efforts to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities (Project Management Institute, 2017, p. 729).

Time Management - the process of planning and exercising conscious control over the amount of time spent on specific activities, especially to increase effectiveness, efficiency, and productivity" (Merriam-Webster, n.d.).

Cost Management -the process of planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget" (Project Management Institute, 2017, p. 294).

Stakeholder Management -the systematic identification, analysis, planning, and implementation of actions designed to engage with stakeholders in order to understand their interests, perspectives, and influence, and to build and maintain positive relationships with them throughout the project lifecycle" (Project Management Institute, 2017, p. 555).

Performance Management -the ongoing process of setting objectives, assessing progress, and providing feedback and coaching to ensure that individuals and teams are meeting their goals and objectives effectively" (Noe, Hollenbeck, Gerhart, & Wright, 2019, p. 228).

Best Practices -the most effective and efficient methods or techniques that have been identified and recognized as superior in achieving desired outcomes or results in a particular field or industry" (Berkun, 2010, p. 12).

High Rise Buildings – “a high-rise building is considered to be one that extends higher than the maximum reach of available fire-fighting equipment. In absolute numbers, this has been set variously between 75 feet (23 meters) and 100 feet (30 meters),” (Knoke, 2006)

CHAPTER TWO: LITERATURE REVIEW

This chapter deals with discussion of project management principles and their significance in building construction projects, Critical analysis of existing literature about project management principles in building construction projects in different parts of the world and specifically in Addis Ababa, identification of gaps and limitations in previous researches.

2.1 Theoretical Review

2.1.1 Project management principles

Project management is a crucial process that aims to achieve certain goals within a specific timeline, budget and scope. As businesses embark on initiatives aimed at improving their productivity or profitability, project management principles play an essential role in ensuring the success of such projects.

Project management principles refer to guidelines that govern the execution of projects. These principles help managers navigate the complexities of projects by creating a framework for decision making, coordination, and control. According to the Project Management Institute (PMI), there are five key principles that underpin project management:

1. **Initiation:** This involves identifying the need for a project, understanding its scope, and determining its feasibility. This can be achieved by conducting a needs assessment, market research, or risk analysis.
2. **Planning:** This involves developing a project plan, outlining the tasks that need to be completed, the resources required, and the timelines. An effective project plan should also include contingencies in case things do not go as planned.
3. **Execution:** This involves carrying out the project plan by coordinating and directing the resources available. This may involve managing teams, communicating with stakeholders, and addressing any risks that may arise.

4. **Monitoring and Control:** This involves tracking the progress of the project and taking corrective action whenever necessary. It also involves ensuring that the project stays within budget and meets the predefined quality standards.

5. **Closing:** This involves formalizing the completion of the project, evaluating its performance, and ensuring that all necessary documentation is in place.

According to the PMI, the followings are some of the well-known project management principles that are frequently applied in most projects including in building construction projects.

1. **Integration Management:** Integration management involves coordinating all aspects of a project to ensure that they work together effectively and efficiently. This includes developing a comprehensive project plan, ensuring that all project activities are aligned with the project objectives, and managing changes to the project scope, schedule, and budget.

2. **Scope Management:** Scope management involves defining and controlling the scope of a project. This includes identifying the project goals, objectives, and deliverables, as well as defining the boundaries of the project and determining what is included and excluded from the project scope.

3. **Time Management:** Time management involves developing a realistic project schedule and ensuring that the project is completed on time. This includes identifying all project activities, estimating their duration, and sequencing them in the most efficient way possible.

4. **Cost Management:** Cost management involves developing a realistic project budget and ensuring that the project is completed within budget. This includes estimating the costs of all project activities, monitoring actual costs against the budget, and making adjustments as needed.

5. **Quality Management:** Quality management involves ensuring that the project delivers high-quality results that meet the expectations of stakeholders. This includes establishing quality standards, monitoring project activities for compliance with those standards, and taking corrective action as needed.

6. **Risk Management:** Risk management involves identifying potential risks to the project and developing strategies to mitigate or avoid them. This includes conducting a risk assessment, developing a risk management plan, and monitoring risks throughout the project lifecycle.

7. **Communication Between Stakeholders:** Effective communication between stakeholders is essential for project success. This includes establishing clear communication channels and protocols, ensuring that stakeholders are informed of project progress and changes, and addressing any concerns or issues in a timely manner.

8. **Schedule Management:** Schedule management involves ensuring that the project is completed on time by monitoring progress against the project schedule and making adjustments as needed. This includes identifying potential schedule risks, developing contingency plans, and communicating schedule changes to stakeholders.

9. **Resource Allocation:** Resource allocation involves identifying the resources needed for the project and ensuring that they are available when needed. This includes identifying the skills and expertise required for the project, allocating resources effectively, and monitoring resource utilization throughout the project lifecycle.

10. **Quality Control:** Quality control involves monitoring project activities to ensure that they are performed according to established quality standards. This includes conducting inspections, testing, and other quality assurance activities, and taking corrective action as needed to ensure that the project delivers high-quality results.

2.1.2 The building construction industry

Construction projects are dynamic and complex, and they require careful management if they are to be delivered within scope, budget, and schedule. Project management principles have been widely used to manage construction projects, but despite their usefulness, there is still debate regarding the extent to which they are necessary and applied in building construction projects.

Construction projects are essential for the growth and development of a country's infrastructure. They usually involve planning, design, execution, monitoring, and control of a project to meet specific goals and objectives.

The building construction industry is a vital part of developing countries such as Addis Ababa, Ethiopia. The industry is responsible for the creation of several infrastructure projects, employment opportunities, and economic development. According to Silva et al. (2019), the construction industry makes up around 8% of the global GDP, and its growth rates are higher than other industries worldwide.

One of the most significant impacts of the construction industry is its contribution to job creation. In Addis Ababa, the construction industry is a significant employer of both skilled and unskilled labor. As stated by Gebreeyesus and Intalaphone (2020), nearly 70,000 housing units were constructed within four years (2014-2018) in Addis, which has been cited to have created 7,600 jobs. The industry is labor-intensive, with direct and indirect job opportunities created for individuals in various fields such as architecture, engineering, surveying, design, and other professionals' groups.

The construction industry is also closely linked to economic development. A study by Mihretu et al. (2020) highlights that in Ethiopia, the contribution of the construction industry to the GDP was approximately 10.3%, while it supported close to 8.3% of total employment in 2015. The growth of the construction sector is essential for generating and sustaining economic activities through the supply chain of goods and services required for the constructing buildings, roads, bridges, and other necessary infrastructures. Thus, the growth of the construction industry would lead to economic development as those invested funds result in new buildings and projects that contribute to creating employment opportunities.

According to global data the Ethiopia construction market size was \$54.8 billion in 2022. The market is projected to attain an AAGR of more than 8% during 2024-2027. Addis Ababa, being the capital of Ethiopia will accommodate a significant amount value in these construction market size especially in building construction.

Furthermore, the construction industry's impact on infrastructure development is critical to enabling progress and growth in Addis Ababa. The construction of basic infrastructure, such as roads, bridges, water supply systems, and electricity networks, supports economic activities across the region. It also provides better living conditions for urban residents, with the construction of housing units and accommodation facilities to improve on the quality of life improving over time (Gebreeyesus and Intalaphone, 2020). Infrastructure projects not only boost economic activities but also facilitate the provision of essential services, access to markets and transportation, thereby creating a more significant level of economic growth.

Buildings are an integral part of construction projects and play a critical role in shaping the urban landscape. They serve as homes, offices, schools, hospitals, and other essential facilities that support the social and economic development of communities. The design and construction of buildings require careful planning, coordination, and execution to ensure that they meet the needs of their users and adhere to safety and environmental standards.

The construction of buildings involves multiple stages, including site preparation, foundation work, framing, electrical and plumbing installations, finishing, delivery to tenants and maintenances.

Each stage requires specialized skills and expertise, and the success of the project depends on effective collaboration between various stakeholders, including architects, engineers, contractors, subcontractor clients and authorities. Building construction projects also involve significant investments in materials, equipment, and labor, making them complex and challenging endeavors.

The building construction industry in Addis Ababa, Ethiopia is currently experiencing a period of growth and development. The city has been undergoing rapid urbanization, with a growing population and an increasing demand for modern infrastructure and housing.

Despite this growth, the industry is facing several challenges. One of the main issues are the lack of skilled man power, which has resulted in delays and increased costs for construction projects. Additionally, there are concerns about the quality of construction materials and practices, which can lead to safety hazards and structural failures (zelele, 2018).

There is also a need for better regulations and enforcement mechanisms to ensure that construction projects adhere to safety standards and environmental regulations.

Overall, the building construction industry in Addis Ababa is poised for continued growth in the coming years. However, it will be important for stakeholders to address the challenges facing the industry in order to ensure sustainable development and long-term success. This includes investing in training programs to develop a skilled workforce, improving quality control measures, and strengthening regulatory frameworks to promote safety and environmental sustainability. Construction project success comes through the application of knowledge-based, critically essential factors. The industry's effectiveness is dictated by the level of project management knowledge built in each company (Hailemeskel.T, 2020)

2.1.3 Evolution of project management in the construction industry

Understanding the evolution of project management in the construction industry requires a deep dive into the evolution of project management principles. Project management principles have been developing for over a century, starting from the early 1900s with industrial production management.

Project management principles are defined as a set of practices that guide and monitor a project's progress towards achieving its objectives while maintaining its constraints. These principles provide guidance through the entire lifecycle of a project, from its conception to close-out.

The use of project management principles in the construction industry started gaining significance after the World War II. With the growth of infrastructure projects such as the construction of highways and airports, there was a realization of the need for systematic planning and coordination.

One of the primary reasons why project management is essential to the construction industry is the complexity of the projects involved. Construction projects usually span several years or even decades, entail multiple stakeholders with varying interests, and involve high-risk activities. To achieve successful outcomes, it becomes necessary to manage the construction projects using a structured approach based on project management principles.

The first significant project management principle that emerged in the construction industry was the Critical Path Method (CPM). CPM was developed in 1957 by Kelley and Walker of the DuPont Corporation. This approach relies on mathematical modeling to identify the critical path, which is the sequence of activities on the project with the longest duration. CPM helped identify tasks that could be undertaken simultaneously while also considering the interdependence of tasks, thus improving efficiency in the execution of construction projects.

The second significant development in project management principles that occurred in the construction industry was the Program Evaluation and Review Technique (PERT). The U.S Navy developed PERT during the development of the Polaris missile system. PERT relied on probabilistic techniques to improve the accuracy of project completion time estimates.

PERT helped the construction industry to account for the uncertainties inherent in construction projects, enabling better forecasts of material requirements, labor capacity, and project timelines.

In the 1960s, the Japanese concept of Lean emerged. It emphasizes the elimination of waste in all forms, which includes wasted time and resources. Lean management principles have since been applied to the construction industry, leading to the development of Lean Construction.

Lean construction aims at reducing costs, increasing productivity, and improving quality, and it does this by adopting Lean tools and techniques such as Value Stream Mapping, Just In Time (JIT) delivery, and Continuous Improvement. These principles have evolved to become a widely accepted approach used in managing construction projects.

Project management principles have evolved from the early 1900s, with the emergence of industrial production management until today, where Lean Construction has gained significant traction in the construction industry. While there is no consensus on the best approach to project management, the adoption of these principles has been critical to the success of construction projects across the globe.

The evolution of project management in building construction projects in Addis Ababa can be traced back to the early 2000s when the city began experiencing a construction boom. During this period, project management in building construction projects was mainly focused on ensuring the timely completion of projects within budget and quality requirements.

However, there has been a significant shift in recent years towards a more holistic approach to project management in building construction projects. This approach emphasizes the need for effective stakeholder engagement, risk management, and sustainability considerations from the early stages of project planning to project delivery and post-project evaluation.

In particular, the adoption of Building Information Modelling (BIM) technology has played a critical role in the evolution of project management in building construction projects in Addis Ababa. BIM technology enables collaboration and coordination between different stakeholders involved in a construction project, including architects, engineers, contractors, and suppliers. This leads to better project outcomes, improved efficiency, and reduced project risks.

Several studies have been conducted on the evolution of project management in building construction projects in Addis Ababa. For example, a study by Girma et al. (2020) titled

"Challenges and opportunities of BIM implementation in Ethiopian construction industry" provides insights into the role of BIM technology in enhancing project management in building construction projects in Addis Ababa.

Another study by Ayele et al. (2019) titled "Critical success factors for construction project management in Ethiopia" highlights the importance of effective stakeholder engagement, risk management, and sustainability considerations in project management in building construction projects in Addis Ababa and Ethiopia as a whole.

2.1.4 The importance of applying project management principles in the building construction industry

Construction industry is an industry that deals with enormous challenges related to workforce, raw materials, machinery and equipment, project completion deadlines and complex designs. Therefore, the use of project management principles in construction industry management is essential for successful project outcome.

Project management principles provide guidelines and procedures for the initiation, planning, execution, monitoring, and control and closing out of construction projects (Dey et al., 2020). These principles enable the project manager to manage and coordinate tasks, optimize resources, and reduce costs through effective communication, risk management, and quality control.

One of the primary benefits of project management principles in construction industry is improved project planning capabilities. Effective project planning can help identify the project goals, constraints, possible risks, coordinate and allocate resources appropriately, and monitor project progress to ensure that work is executed within the scheduled time frame (Kala et al., 2019). Project management principles allow the project manager to develop a comprehensive project schedule that covers all aspects of the project lifecycle, from design to project completion.

Another advantage of using project management principles in construction industry is the ability to manage risks effectively. Identifying potential risks and developing mitigation strategies are fundamental to project success (Jha et al., 2019).

Project management principles provide methodologies and tools for risk management, including risk assessment, risk monitoring, and response planning.

Quality control is essential in ensuring that construction projects meet industry standards and regulations. Project management principles enable the project manager to establish quality standards and procedures, track quality metrics, and implement corrective actions when necessary (Abdullah et al., 2021).

Effective communication is critical to the success of construction projects. Project management principles provide a framework for establishing communication channels among team members (Chiles et al., 2018). Using these principles, the project manager can facilitate communication throughout the project lifecycle, keeping team members informed of project goals, progress, and any changes that may impact the project.

The significance of project management principles in construction industry is paramount. These principles provide a structured approach for managing projects to ensure successful delivery. By integrating these principles into construction project management, project managers can better identify and manage risks, optimize resources, ensure quality control, and promote effective communication among team members.

Ayalew, Dakhli, and Lafhaj (2016) asserted the level of construction project management practice in the Ethiopian construction industry in terms of adapting the standard project management procedure, tools, and techniques to be unsatisfactory. Safety, risk, and time management were found at the low stage and key challenging issues for project managers.

2.1.5 Challenges in implementing project management principles in construction

Project management principles play a significant role in managing building construction projects. Successful implementation of project management principles ensures that a project is completed within schedule, budget, and quality constraints. However, implementing project management principles in construction projects faces several challenges. Some of the most prominent challenges faced according to PMI are discussed below.

The first challenge to implementing project management principles in construction projects is **poor planning**. Many construction projects do not adequately plan, which leads to project delays, cost overruns or poor-quality output. Well-detailed project plans are essential for successful implementation of project management principles (PMI).

Therefore, project planners, engineers, and architects must develop detailed project plans that clearly define project scope, budget, and schedule.

The second challenge of implementing project management principles in construction projects is **communication breakdowns**. Construction projects involve numerous stakeholders such as contractors, sub-contractors, project managers, and clients. Effective communication between all parties involved in the project is fundamental for the success of the project. Miscommunication among stakeholders may lead to misalignment of objectives, inaccurate decision making, and project delays. Therefore, project managers need to ensure proper communication channels are established during the project's initial planning stage (PMI).

The third challenge to implementing project management principles in construction projects is a **lack of skilled manpower**. Skilled and experienced personnel can efficiently implement project management principles, improving project delivery. Unfortunately, most construction projects often face a shortage of skilled personnel in critical areas such as engineering design, project scheduling, materials management, and project risk management. Hence, construction companies must invest in comprehensive training programs to increase the skills level of their employees (PMI).

The fourth challenge to implementing project management principles in construction projects is **safety concerns**. Construction sites are often high-risk areas; safety measures need to be in place to protect workers from accidents and injuries. Project management principles should also address safety concerns with risk mitigation protocols formulated to curb accidents and mitigate safety-related risks (PMI).

Finally, **technology** integration is another challenge that affects the implementation of project management principles in construction projects. While technology can improve project delivery, construction companies may face several technological challenges such as connectivity issues, inadequate adoption or implementation of new technologies, and limited access to cutting-edge construction technology. Technology can increase project speed, reduce labor requirements, and improve the quality of output; therefore, providing necessary funding for innovation is essential (PMI).

Implementing project management principles in construction projects remains a challenge despite its benefits. Project managers involved in construction projects need to be proactive in addressing these challenges to ensure successful project delivery.

Adequate planning, effective communication, skilled personnel, safety measures, and technology integration are critical components of project management principles that can lead to the successful implementation of construction projects.

2.1.6 The gap between theoretical and practical aspect of project management principles

The gap between theoretical principles of project management and their actual application in construction projects can often be significant. This can be due to a variety of factors such as the complexity of real-world projects, changes in project requirements or conditions, the influence of stakeholders, and other external factors.

Some of the key challenges that contribute to this gap include ineffective communication and collaboration among project team members, inadequate risk management practices, lack of integration between different project phases, and limited planning and control measures.

Several studies have explored this topic and highlighted the gap between theory and practice in project management in construction projects. For instance, a study by Eadie et al. (2013) explored the implementation of project management principles in construction projects in the United Kingdom and found that there were significant differences between theory and actual practice. Similarly, a study by Zou et al. (2017) focused on project management practices in China's construction industry also found significant gaps between theoretical principles and their practical application. This helps understand the existence of potential gap between the theoretical aspect of the principles and the practical aspect in the real world.

2.2 Empirical Review

2.2.1 Building construction projects and project management principles

Construction projects have become an essential part of the growth and development of cities such as Addis Ababa. The city of Addis Ababa has witnessed a rapid increase in building construction projects in the last decade, with many of these projects being small to large scale, ranging from residential to commercial facilities. While these projects may have brought about several innovative structures to the city, their successful completion and delivery are fraught with several challenges that can lead to project failures.

Owing to this, it would be necessary to analyze the significance of implementing project management principles in building construction, especially in Addis Ababa.

However, achieving successful project completion in a timely, budget-friendly, and quality manner has proven to be challenging. In a study by Tadesse et al. (2014), the lack of project management principles in construction projects was identified as the primary cause of delays, cost overruns, and poor-quality outcomes. The importance of project management principles in construction projects is evident in research studies; hence it is essential to analyze the Contribution and extent to which they are applied in Addis Ababa.

A research study conducted by Gizaw and Oda (2019) analyzed the necessity of project management principles in the context of Ethiopian organizations. The study pointed out that the absence of proper application of project management principles leads to project overruns, delays, and failure. This is particularly common in the construction sector, where complex interdependencies exist between the various project team members, including architects, contractors, and engineers.

In addition, Teclu and Ayele (2018) emphasized the importance of the Project Management Body of Knowledge (PMBOK) in delivering successful construction projects. They highlighted that PMBOK provides a framework for effective project management in the construction sector and recommended that organizations in Ethiopia should consider implementing PMBOK to enhance better project performance.

In a study conducted by Ayele, Zebene, and Tariku (2018), it was established that there is a positive correlation between the application of project management principles and project success in the Ethiopian construction industry. Specifically, the study found that effective planning, resource allocation, and controlling the project environment result in successful project completion.

Effective application of project management principles can enhance construction performance significantly. According to DeWitt and Koste (1985) research, effective project management techniques such as scheduling, cost control, and quality assurance are critical in delivering successful construction projects. Similarly, Kumaraswamy and Rahman (2002) found that utilizing sound project management tools and techniques leads to better project outcomes, including improved quality, timely delivery, and cost-effectiveness.

In an empirical study conducted by Antwi and Osei-Amponsah (2018) in Ghana, the authors provided evidence on the benefits of using project management principles on construction projects. Their study affirmed that efficient project management practices contribute significantly to a successful project completion. Specifically, they noted that effective use of project management approaches can aid in monitoring the costs, schedule, scope, and risks associated with construction projects, leading to timely delivery, high-quality output, and increased client satisfaction.

2.2.2 Application of Project management principles in building Construction projects

The construction industry is a complex and risky environment that requires effective project management practices to ensure successful project completion. The application of project management principles leads to better control of time, cost, scope, quality, communication, risk, and procurement in construction projects. According to the study conducted by Akram et al. (2019) in Pakistan, the use of project management principles significantly improves project performance in terms of time and cost efficiency, quality management, stakeholder coordination, and project sustainability. Thus, the application of project management principles would be essential for the successful completion of construction projects in Addis Ababa.

However, the implementation of project management principles in construction projects faces various challenges such as cultural and organizational resistance, inadequate project planning, poor communication, and lack of skilled manpower. As studied by Olawale and Sun (2010) in Nigeria, the absence of project management practices and principles led to significant time and cost overruns, poor quality, and unsatisfied stakeholders in construction projects. Therefore, it is crucial to overcome these challenges and encourage the adoption of project management practices in construction projects in Addis Ababa.

To achieve successful project management practices in construction projects, project managers should have adequate knowledge and skills in project management methodologies, tools, techniques, and software. Additionally, project managers should have effective leadership, communication, negotiation, and decision-making skills that enable team collaboration and coordination. As noted by Belassi and Tukel (1996) in Jordan, the competence of project managers positively influences project success, which includes completing projects within budget, schedule, and performance objectives.

Thus, enhancing the skills and competencies of project managers is an essential factor in implementing project management practices in construction projects in Addis Ababa.

2.2.3 Challenges in implementing project management principles in construction projects.

"The construction industry is known for its complexity and uniqueness, which poses numerous challenges in implementing project management principles. Some of the significant challenges include unclear requirements, lack of coordination among various stakeholders, inadequate communication, and resistance to change. For successful implementation, there should be a focus on stakeholder involvement, communication, training, and customization of the project management principles to suit the needs of the construction industry" (Ogunsanmi et al., 2020).

"The implementation of project management principles in the construction industry faces several challenges, including scheduling conflicts, quality control issues, and labor productivity. One of the most significant challenges is the lack of industry-wide adoption and standardization of project management processes and tools. This makes it challenging to collaborate and create a seamless flow of information between project teams and stakeholders" (Goddard & O'Brien, 2017)

"Construction projects are often implemented on a strict timeline, and any delay can impact project costs and stakeholder satisfaction. The implementation of project management principles in the construction industry faces challenges such as changing project scopes, unexpected delays, and insufficient resources. Effective communication, risk assessment, and contingency planning are essential factors for successful project management in construction" (Bolino et al., 2015).

"The construction industry has a complex mode of operation that has limited the effective implementation of project management principles. Some of the significant challenges include poor planning, inadequate risk management expertise, poor communication, insufficient leadership, and poor feedback systems. Effective implementation requires the adoption of a holistic approach that focuses on improving governance, building capacity, and technology transfer decisions" (Lema et al., 2019).

2.2.4 The practice of project management principles in building construction projects

Project management principles are essential for the successful execution of construction projects. Construction projects are unique, complex and require specialized attention to ensure successful completion. In Addis Ababa, the practices of project management principles have been implemented to facilitate the delivery of construction projects. Research studies have shown that adherence to project management principles such as risk management, communication, and stakeholder management has contributed to the success of construction projects in Addis Ababa (Adane, Demissie, & Adane, 2018).

One area that has proven crucial to the successful implementation of project management principles is stakeholder engagement. Stakeholder management involves identifying, analyzing, and understanding the needs of all parties involved in the construction project. Effective stakeholder engagement has been found to improve project outcomes by ensuring all parties are satisfied with the project's objectives and the overall goal. Furthermore, it helps promote transparency, build trust, and communication (Tisa, Taylor, & Singh, 2019).

Additionally, research studies have reported that the application of risk management principles in construction projects is essential. Risk management involves identifying potential risks throughout the project's life cycle, assessing their likelihood, and developing mitigation strategies to reduce their impact on the project's success. The effective implementation of risk management principles has been associated with minimizing project delays and controlling project costs. This has been reported in several studies, including work by Tilaye, Asfaw, and Dagmawi (2019).

CHAPTER THREE: RESEARCH METHODOLOGIES

This chapter provides the explanation of the research design and methodology used, research approach, description of the sampling technique, sample size, data collection methods and survey instruments, and data analysis technique, discussion and interpretation of data and ethical considerations

3.1 Research Design

A selection of suitable research method that allows for the collection of reliable, amiable and valid data is most important. The research is descriptive that used a mixed methods research design is integrating both qualitative and quantitative design. A random sampling technique were utilized and primary and secondary sources of data collection were used to gather data. Additionally, ethical consideration has been considered in conducting the research

3.2 Research Approach

This study will adopt a mixed-method design, which involves both quantitative and qualitative approaches to gather and analyze data. The mixed-method will explore both quantitative data (numerical) and qualitative data (descriptions) related to the topic. The findings from both approaches will be integrated to provide comprehensive understanding for the subject of interest and underline the common theme and bigger picture. The mixed-method will allow for a more holistic approach in capturing the complexity of the construction project as well as providing more diverse perspective that will enrich the findings.

3.2 Sampling Technique and Sampling Size

The sampling technique used were random sampling technique. The random sampling technique is chosen due to the diversity of project nature and the difficulty to select a sample that is truly representative of the population.

The population considered in the research were professionals that participate in high rise buildings whose physical progress exceed more than sixty percent. High rise buildings were chosen for their complexity, high resource intake, experience of parties involved in the projects and possibility of demand to implement project management principles for successful completion.

There are different professionals involved in these projects. But professionals that are active in the projects working for different parties were selected randomly both from offices and from project sites.

The participants were selected randomly from the population for ensuring each member of the population has an equal chance of being selected. The sampling can help to reduce bias in the sample selection process and increase the generalizability of the findings to the larger population.

The projects that are included in the selection process were more than fifty projects that were actively ongoing and had a physical status exceeding sixty percent.

The sample size of at least **90** participants from all groups of the population were selected. And **70** of the selectees responded to the questionnaire provided to them. Some of the factors that are put into consideration for selecting the sample size are; the research question, the population size, sampling technique and statistical power.

3.3 Data Collection and survey instruments

The research will use primary data collection methods such as questionnaires, interviews, survey and secondary data collection such as literature studies, published and unpublished research papers.

A structured survey instruments with questionnaire will be used to collect quantitative data from respondents involved in the building construction industry in Addis Ababa. It will provide unbiased responses from individuals with different professional background, such as project managers, architects, construction engineers, office engineers, contractors, client engineers, specialized consultants.

A semi-structured interview will be conducted with key personnel involved in construction projects in Addis Ababa which are currently on progress. These interviews can provide in-depth qualitative information regarding their experience, challenges and success when it comes to applying project management principles.

Additionally, observational data collection was utilized to gather data about construction sites in Addis Ababa.

Observing and documenting project management practices in real-time had also provided a better insight into how effective project management principles are applied in the construction industry particularly in the selected projects for this research purpose.

3.4 Data Analysis

Data gathered were analyzed quantitatively using statistical software called SPSS and qualitatively through content analysis. The data have been cleaned before fed in to the software to remove any errors and inconsistencies which involves checking for missing data, outliers, and any other anomalies that may affect the analysis.

The software SPSS is a powerful tool that can sufficiently analyze a data from questionnaire collected in this research.

Data visualization techniques such as charts, graphs, and tables were used to present the results of the analysis in a clear and concise manner which helps the interpretation processes

Reliability test were made on SPSS to check the internal consistency of the responses. Cronbach Alpha is a reliability test was conducted within SPSS in order to measure the internal consistency i.e., reliability of the measuring instrument (Questionnaire). The Cronbach alpha test ranges from 0 to 1. A higher value indicates greater reliability. The table here below shows the Cronbach alpha test taken for the above listed questions and the responses of the respondents.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.745	.749	6

Table 1. Cronbach alpha test for reliability of responses 1

In the above table its shown that the alpha Cronbach is found to be **0.745** and this number signifies that there is a moderate internal consistency among the items that are listed above.

This also means that the items are moderately related to each other and are measuring a similar construct. Hence, it would be practical to proceed to analyzing the data in the items with regard to subject matter.

3.5 Ethical Considerations

It is important to consider ethical issues in research and obtain informed consent from participants before collecting data from them. Some of the most important ethical consideration values that were integrated in this research project are; informed consent from participants, confidentiality of data, proper data management, the protection of research subjects (mentally) and the avoidance of bias.

CHAPTER FOUR: ANALYSIS OF FINDINGS

This chapter presents and analyses of the data collected, evidence to support or reject research questions, Comparison with previous studies to identify similarities and differences.

4.1 Data Analysis and Findings

The aim of this research analysis is to examine the perception and approaches of building construction professionals on project management principles. To collect data for the study, both quantitative and qualitative methods were employed. A total of 70 construction professionals completed questionnaire while 10 project managers participated in interviews.

The professionals participated in the questionnaire were engineers working on the selected projects as site supervisors, contract administrators, client engineers, quality and safety control engineers, project coordinators, office engineers, site engineers and architects. The professionals who participated in the semi-structured interviews are project managers who have experience in the industry for more than fifteen years.

After the data were collected, statistical software called SPSS were used to analyze the quantitative data. The software offers powerful statistical analysis tools that provide descriptive and inferential results in a variety of formats, including tables and charts. The aim of using SPSS in this analysis is to provide a through presentation and interpretation of the data in an organized way. On the other hand, the qualitative data obtained through interviews were transcribed briefly and then analyzed in an explanatory manner. Through rigorous examination of insights and perceptions referred by project managers, conclusion is made to yield insight regarding the industry's perspective regarding project management principles

The prominent findings of this project from the collected data through the questionnaire, interview and conducted analysis are:

- ❖ The knowledge and experience of building construction professionals about project management principles in Addis Ababa.
- ❖ The perception of the importance of project management principle in building construction projects in Addis Ababa.
- ❖ The frequency of the application of project management principles in the building construction projects in Addis Ababa.

- ❖ The difficulty to implement project management principles in building construction projects in Addis Ababa.
- ❖ The need for customization of project management principles and tools to suit the specific construction environment.

The objectives of this research were clearly stated in the first chapter of the paper which also align with the research questions stipulated in the same chapter. The objectives will be dealt here below with the quantitative data collected along with the conducted analysis based on the responses of the participants.

The sections below show the results from the conducted analysis and the interpretations that follows. Some recent researches are also being reviewed for comparison and reference purpose with respect to the specific results and case scenarios. The last two objectives will be interpreted based on the quantitative data collected from questionnaire which constitutes 70 participants responses who were actively involved in the going projects.

4.1.1 To what extent do building construction projects in Addis Ababa adhere to project management principles to ensure successful project completion?

To respond to this specific research question, a serious of questions were provided that are believed to be related. The implementation of project management principles in building construction projects are somehow related to the following key points:

- The awareness and knowledge these professionals have on project management principles and the impact it has for the successful completion of projects.
- Familiarity of professionals with project management software and tools that can be utilized in building construction projects.
- Trainings taken by building construction professionals related to project management principles.
- The perception of professionals on the relevance of project management principles for the successful completion of building construction projects.
- The frequency the professionals apply project management principles in building construction projects.

The table shown below contains the questions the respondents were asked and the correlation matrix between the individual questions to check how related the questions are to one other.

Inter-Item Correlation Matrix						
Questions respondents responded to	Do you have any idea or knowledge on the impact of project management principles in construction projects	you aware about project management principles being applied in construction projects	you familiar with any project management software tools used to manage projects	project management principles can reduce overall project costs in the construction industry	project management principles improve the work environment of construction projects	lack of project management principles can lead to project delays, cost overruns and quality related problems
Do you have any idea or knowledge on the impact of project management principles in construction projects		.739	.635	.136	.398	.205
you aware about project management principles being applied in construction projects	.739		.530	.134	.385	.070
you familiar with any project management software tools used to manage projects	.635	.530		.087	.346	.077
project management principles can reduce overall project costs in the construction industry	.136	.134	.087		.261	.429
project management principles improve the work environment of construction projects	.398	.385	.346	.261		.535
lack of project management principles can lead to project delays, cost overruns and quality related problems	.205	.070	.077	.429	.535	

Table 2 Inter-Item correlation matrix of responses for conducting analysis on knowledge in project management principles.

The table above showed the correlation of the items that were tested for alpha Cronbach. The correlation matrix here shows the pairwise correlations between all variables in the dataset shown above. It this square matrix where the diagonal elements that are always 1 (since each variable is perfectly correlated with itself) are eliminated and the off-diagonal elements represent the correlation between each pair of variables.

The correlation coefficient ranges from -1 to +1, with negative values indicating a negative correlation (when one variable increases, the other decreases) and positive values indicating a positive correlation (when one variable increases, the other also increases).

Hence, as shown on the table the items that were tested for alpha Cronbach are imitatively related as most of the values are above zero and close to 1. Based on the above Cronbach test and correlation matrix it is possible to analyze further on the respondent’s answer. Here below is a table and a pie diagram that shows respondents response on one of the questions from the above table.

Based on the collected data from the responses of the respondents concerning to the adherence of project management principles in building construction projects is stipulated as follows.

How often do you think project management principles are used in Building construction projects				
Response	Frequency	Percent	Valid Percent	Cumulative Percent
Rarely	8	11.4	11.4	11.4
Sometimes	18	25.7	25.7	37.1
Often	18	25.7	25.7	62.9
Always	26	37.1	37.1	100.0
Total	70	100.0	100.0	

Table 3 Frequency and percentage of respondents on the adherence of building construction projects with project management principles

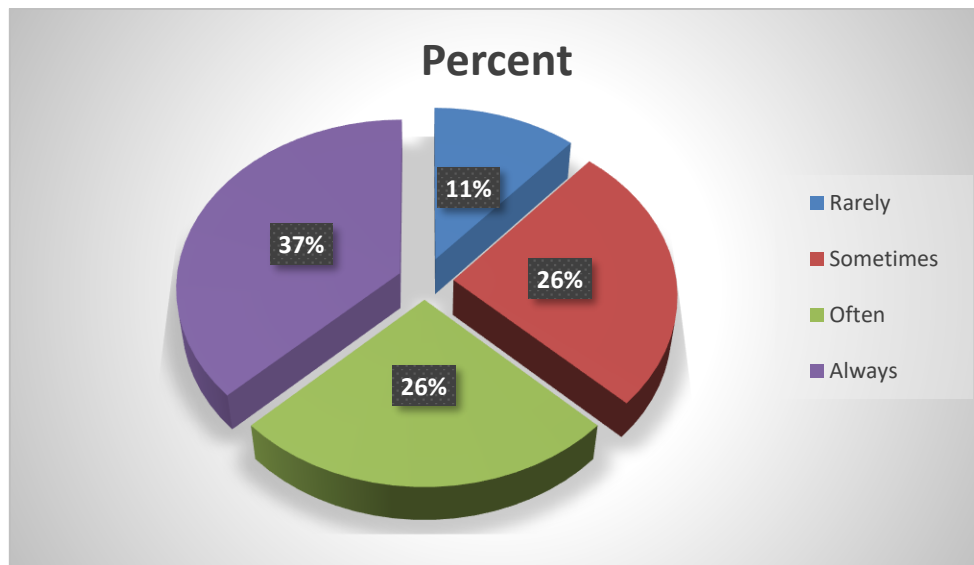


Figure 1: Frequency and percentage of respondents on the adherence of building construction projects with project management principles

Based on the data collected from the questionnaire, it can be concluded that 37% of the participants believe that building construction projects in Addis Ababa always adhere to project management principles from their experience. Meanwhile, 26% think that projects sometimes follow these principles, another 26% believe that it often occurs, and 11% claim that it rarely happens.

From this information, we can say that there are still a significant number of participants who believe that project management principles are not fully implemented in building construction projects. These findings may have implications that can initiate relatable research question, particularly with regard to identifying reasons why project management principles are not being implemented and strategies that may improve adherence to these principles.

The data shows that professionals that believed that project management principles are adhered are still not sufficient to say that building construction projects in Addis Ababa adhere to the basic project management principles. It can be inferred that these projects will encounter problems related to project constraints due to the inapplicability of the principles.

According to other study conducted by Tadesse and Mekonen (2018) on the relationship between adherence to project management principles in building construction projects and the knowledge, awareness, familiarity and training of construction professionals revealed that these factors played a significant role in ensuring the successful implementation of construction projects. The study found that building construction projects that adhered to project management principles such as planning, monitoring, and controlling were mor likely to be completed on time, within budget and the required quality standards. The study also found that the level of knowledge and familiarity of construction professionals with project management principles is crucial for the sustainable development of the construction industry in Addis Ababa.

Similarly, a study conducted by Semunigus (2019) examined the impact of project management principles on the performance of building construction projects in Ethiopia. The findings of the study revealed that project management principles had a significant positive effect on the performance of building construction projects. The study also found that the level of knowledge, awareness, and familiarity of construction professionals with project management principles significantly influenced the implementation of construction projects.

The study concluded that providing adequate training to construction professionals on project management principles could improve the performance and successful implementation of building construction projects in Addis Ababa.

Other literature review indicates that there is a strong relationship between adherence to project management principles and the knowledge, familiarity, and training of construction professionals in building construction projects in Addis Ababa. Various studies have shown that the use of project management principles such as planning, risk assessment, monitoring and control, and communication, can improve project success rates significantly. For example, a study conducted by Kassa et al. (2018) found that construction professionals with better knowledge and skills in project management reported fewer delays and cost overruns in their projects. Other studies, including Ayele and Tilahun (2016), have also highlighted how proper project management practices can reduce rework, promote collaboration among team members, and facilitate effective decision-making.

However, despite the evidence supporting the benefits of adherence to project management principles, some studies have highlighted gaps in skills, knowledge, and familiarity among construction professionals in Addis Ababa. For instance, the study by Tadesse and Chekol (2017) revealed that some project managers lacked adequate training, which led to poor planning, inadequate risk management, and poor communication among team members. According to Wondimu and Chilomo (2020), the low level of awareness and adherence to project management principles is partly due to the lack of formal training in project management in many universities in Ethiopia.

Therefore, it is essential to provide continuous training and education to construction professionals to enhance their knowledge and skills in project management and improve adherence to project management principles in building construction projects in Addis Ababa.

The respondents were also asked to give their perception on the possible contribution of project management principles in building construction projects taking their experience and the exposure they have in the construction industry. Their response towards the importance of project management principles have been analyzed descriptively.

Importance of using project management principles in the successful completion of Building construction projects				
Response	Frequency	Percent	Valid Percent	Cumulative Percent
Very Unimportant	6	8.6	8.6	8.6
Neutral	1	1.4	1.4	10.0
Important	13	18.6	18.6	28.6
Very Important	50	71.4	71.4	100.0
Total	70	100.0	100.0	

Table 4 Frequency and percentage of respondents on the importance of project management principles on successful completion of projects

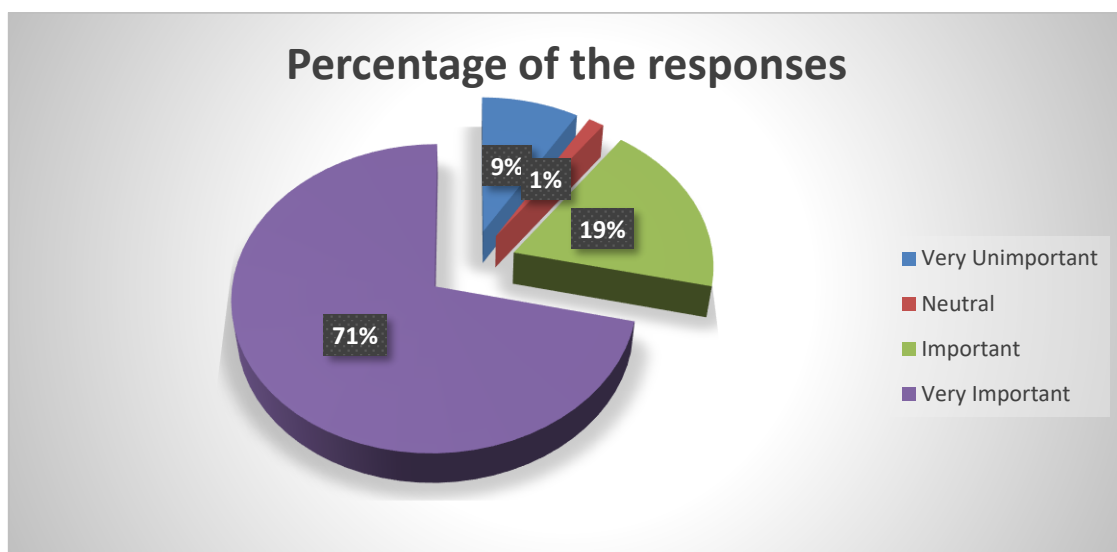


Figure 2: Frequency and percentage of respondents on the importance of project management principles on successful completion of projects.

Based on the data collected from the questionnaire, it can be concluded that project management principles have a high level of importance in the successful completion of building construction projects in Addis Ababa.

Majority of the participants (71%) indicated that project management principles are very important while only 1% find the principles to be very unimportant. This result indicates that the project management principles are widely believed to have a significant contribution in the construction industry the respondents exposed to.

The low percentage of participants who are neutral (9%) suggests that there is a strong consensus on the significance of the principles. Meanwhile, the 19% of respondents who rated the project management principles as important also support this claim.

This information can be used in this research paper to emphasize the importance of implementing project management principles in building construction projects to achieve successful completion. The findings from the result indicate that it's necessary for the stakeholders involved in projects to recognize the value of project management principles and their role in the success of projects. Thus, increased adoption of project management principles could lead to better project outcomes in the achievement of project goals and success.

According to numerous empirical studies, implementing project management principles is necessary for the success of building construction projects. In today's highly competitive construction industry, project management plays a crucial role in ensuring that the project is completed on time, within budget, and meets the client's requirements. In addition, project management helps to manage the risks and uncertainties associated with construction projects, ensuring that quality standards are met consistently. Without utilizing project management principles, there is a high probability that the construction project will not be delivered on time, budget, or quality. (Darko & Chan, 2017)

Project management principles, such as planning, organizing, directing, and controlling, have become increasingly crucial in managing building construction projects. These help to set objectives, identify and mitigate potential risks and uncertainties, allocate resources effectively, communicate clearly, monitor and measure progress, and evaluate performance. In addition, successful implementation of project management principles ensures effective stakeholder collaboration, which is essential in large and complex building construction projects. The benefits of adopting these principles extend beyond completing the project on time, budget, and quality but also lead to efficient resource utilization, improved communication, and overall client satisfaction. (Nguyen & Ogunlana, 2012)

Implementing project management principles in building construction projects is critical to ensuring that the project is completed within budget, meets quality standards, and satisfies the client. With the adoption of project management principles, professionals in building construction projects can minimize risks and uncertainties, allocate resources effectively, ensure effective communication, and monitor performance.

It is, therefore, highly recommended that building construction professionals adopt these principles to ensure the success of their projects. (Qureshi et al., 2021)

4.1.2 Identifying challenges faced by building construction teams when implementing project management principles

Identifying the frequency of application of project management principles helps in strategic decision making. Understanding how frequently these principles are applied in the construction industry, and which ones are used most, helps organizations to identify areas where they need to focus to improve their project management processes. As a result, a data was collected which of the most common project management principles are being frequently used in building construction projects.

The most essential project management principles that are important for the success of a construction project according to the project management institute (PMI) are Integration management, Scope management, Time management, Cost management Quality management, Risk management, Communication between stake holders, Schedule management, Resource allocation and Quality control.

For the above-mentioned project management principles, a Cronbach alpha test were taken to check the reliability and the internal consistency of the responses.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.936	.937	10

Table 5 Cronbach alpha test for reliability of responses 2

In the above table its shown that the alpha Cronbach is found to be 0.936 and this number signifies that there is a sufficient internal consistency among the items that are listed above. This also means that the items are moderately related to each other and are measuring a similar construct. Hence, it would be practical to proceed to analyzing the data in the items with regard to subject matter.

The table shown below contains the questions the respondents were asked and the correlation matrix between the individual questions to check how related the questions are to one other.

Inter-Item Correlation Matrix										
	The applicability of integration management in construction projects	The applicability of scope management	The applicability of cost management	The applicability of quality management	The applicability of risk management	Communication between stakeholders	The applicability of schedule management	Resource allocation and budget management	Quality inspection and quality control	The applicability of time management
The applicability of integration management in construction projects	1.000	.729	.517	.582	.584	.547	.481	.475	.535	.606
The applicability of scope management	.729	1.000	.598	.619	.576	.503	.442	.425	.447	.514
The applicability of cost management	.517	.598	1.000	.707	.616	.452	.665	.623	.462	.578
The applicability of quality management	.582	.619	.707	1.000	.796	.589	.571	.552	.643	.681
The applicability of risk management	.584	.576	.616	.796	1.000	.596	.538	.560	.609	.656
Communication between stakeholders	.547	.503	.452	.589	.596	1.000	.650	.659	.543	.660
The applicability of schedule management	.481	.442	.665	.571	.538	.650	1.000	.842	.614	.695
Resource allocation and budget management	.475	.425	.623	.552	.560	.659	.842	1.000	.661	.655
Quality inspection and quality control	.535	.447	.462	.643	.609	.543	.614	.661	1.000	.765
The applicability of time management	.606	.514	.578	.681	.656	.660	.695	.655	.765	1.000

Table 6 Inter-Item correlation matrix of responses for conducting analysis 2

The table above showed the correlation of the items that were tested for alpha Cronbach. The correlation matrix here shows the pairwise correlations between all variables in the dataset shown above. It this square matrix where the diagonal elements that are always 1 (since each variable is perfectly correlated with itself) are eliminated and the off-diagonal elements represent the correlation between each pair of variables.

The correlation coefficient ranges from -1 to +1, with negative values indicating a negative correlation (when one variable increases, the other decreases) and positive values indicating a positive correlation (when one variable increases, the other also increases).

Hence, as shown on the table the items that were tested for alpha Cronbach are imitatively related as most of the values are above zero and close to 1. Based on the above Cronbach test and correlation matrix it is possible to analyze further on the respondent’s answer. Here below is a table and a pie diagram that shows respondents response on one of the questions from the above table.

Based on the collected data from the responses of the respondents concerning to the Encountered difficulties in implementing project management principles in your construction projects in building construction projects is stipulated as follows.

Encountered difficulties in implementing project management principles in your construction projects					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	4	5.7	5.7	5.7
	Rarely	13	18.6	18.6	24.3
	Sometimes	26	37.1	37.1	61.4
	Often	14	20.0	20.0	81.4
	Always	13	18.6	18.6	100.0
	Total	70	100.0	100.0	

Table 7 Frequency and percentage of respondents on encounters of difficulty in implementing project management principle

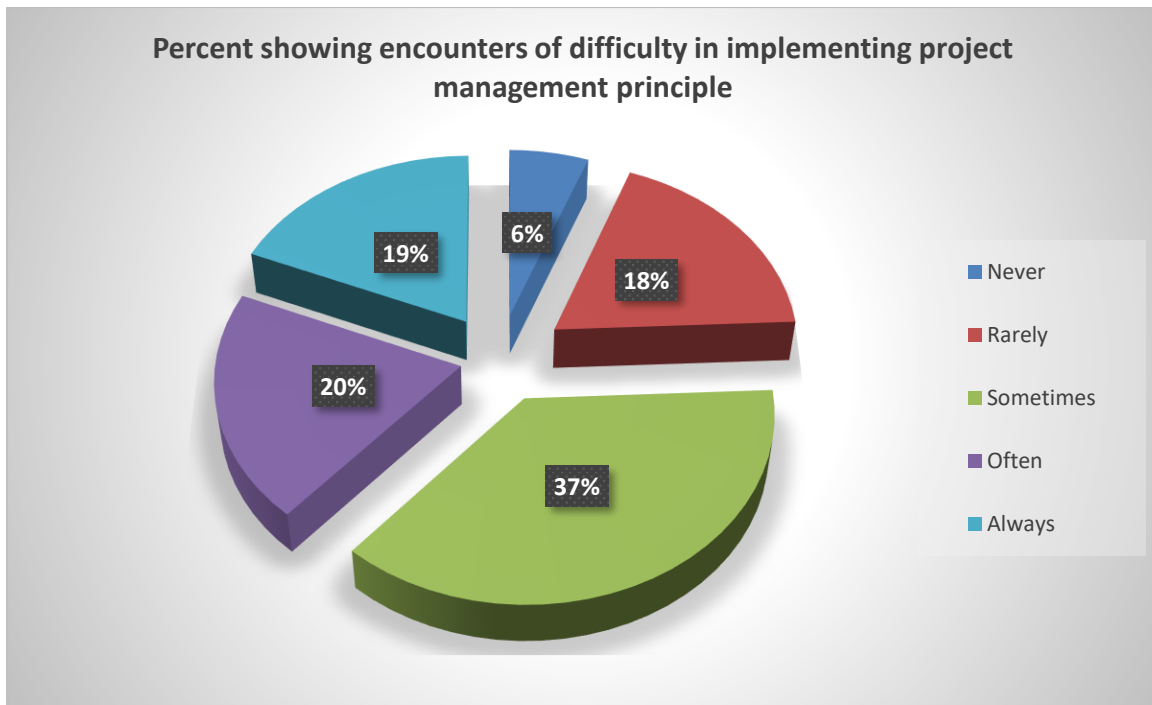


Figure 3: Frequency and percentage of respondents on the importance of project management principles on successful completion of projects

Based on the data, the majority of construction professionals encounter difficulties in implementing project management principles at least "sometimes" (37%). It is also significant to note that a considerable proportion of respondents encounter these difficulties "often" (20%) and "always" (19%). This suggests that project management challenges are prevalent within building construction projects in Addis Ababa.

Interestingly, a sizeable percentage of respondents (18%) rarely experience challenges in implementing project management principles, while only 6% never encounter these difficulties. To address these challenges, the research paper may need to investigate the specific types of project management principles that are most frequently encountered as problematic and evaluate why some individuals appear to face few (or no) implementation challenges. The findings from this study could contribute to better training or support for construction professionals working within building construction projects in Addis Ababa, ultimately leading to improved project management practices and outcomes.

From the above data it can be inferred that most professionals affirmed the encounter of difficulties while implementing project management principles in the projects they have participated in. Despite the acknowledgement of the importance of these project management principles and the means of executing them there is still a hindrance in the effects and its contribution due to the difficulty to implement.

There has been a growing interest in the application of project management principles in building construction projects in Addis Ababa. The frequency of the application of these principles has been shown to have a significant impact on the challenges experienced during implementation. A study by Hailu and Kumie (2017) found that frequent application of project management principles such as risk management, cost control, and schedule control was linked to a lower likelihood of delays and cost overruns. However, challenges remained in areas such as stakeholder management, procurement, and communication.

Another study by Shiferaw and Mersha (2020) also found a link between the frequency of project management principles and their successful implementation in building construction projects in Addis Ababa. The study showed that the use of project management software, project management training, and regular project monitoring were crucial for successful project delivery. Despite these benefits, challenges such as inadequate experience and skills in project management, limited availability of project management tools, and lack of support from government agencies continue to hinder the implementation of project management principles in building construction projects in Addis Ababa.

4.1.3 The major problems observed in building construction projects in Addis Ababa and what project management principles can address these problems.

Qualitative data were also collected to analyze and interpret the responses for achieving some objectives of this research project. The qualitative data is utilized for it is an exploratory approach to collecting data that aims to answer complex questions. It is a useful tool for gaining insight on the opinions, perceptions and attitudes of participants in a given area of study. In this analysis and interpretation of qualitative data collected from interviews with 10 project managers who have worked in different building construction projects for many years, the researcher was interested in understanding the major challenges faced in building construction projects in Addis Ababa and how project management principles can address these problems.

The use of interviews in collecting data for qualitative analysis provides an in-depth understanding of the viewpoints and experiences of participants. We will explore the interview responses from these experienced project managers and identify some of the recurring themes or patterns which may have emerged. Our goal is to gain insights into the major problems encountered in building construction projects in Addis Ababa and also understand how project management principles can be used to address these problems. Ultimately, this analysis will contribute to the improvement of project management practices in the building construction sector in Addis Ababa.

As a researcher who conducted interviews with 10 project managers in Addis Ababa, I have observed several patterns that hinder the progress of building construction projects in the region. Firstly, it was noted that the building construction industry lacks up-to-date knowledge as it follows trends that are believed to be more profitable by specific stakeholders. This could be due to the fact that trends are easily adopted and can generate quick profits without the necessary research and development that would improve the industry. This phenomenon may lead to many mistakes, which in turn could result in project failures.

Secondly, the unwillingness of stakeholders to abide by regulatory standards set by both regulatory bodies and projects is a major challenge in the building construction industry. Despite the availability of standard regulations, stakeholders seem less interested in adhering to them, perhaps because compliance with these standards may require additional costs or due to other potential challenges. This lack of adherence to standards can significantly lower the quality of construction work delivered, which can ultimately lead to structural failures and endanger the safety of occupants.

Thirdly, regulatory bodies' loose watch on building construction projects has also been identified as a prevalent issue. It appears that due to various factors such as inadequate resources, the regulatory bodies may not be able to effectively monitor project implementation processes, resulting in substandard practices being employed during construction. The consequences of such actions are often devastating, leading to life-threatening situations and property damage.

Fourthly, the shortage of skilled manpower with a proper understanding of building construction and project management principles was noted as a significant challenge. There is a critical need for highly knowledgeable individuals who can apply the latest construction methods and adapt to changes quickly.

The nature of the industry is such that it requires specialized skills, which can only be acquired through intense training, apprenticeship, and hands-on experience. Therefore, it is time for concerned parties, including academics, regulators, and industry players, to come together to find ways to address this challenge and improve the quality of construction work delivered.

Finally, it was found that unpredictable socio-economic changes that occur abruptly also present a challenge in the building construction industry. For instance, natural disasters, pandemics, or any other unforeseen events may disrupt ongoing construction activities, which can significantly affect progress and result in time delays, loss of value, and increased costs. As such, project managers should be adequately prepared for these sorts of situations and equipped with robust risk management strategies to mitigate the impacts of such occurrences.

CHAPTER FIVE: MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Major findings of the research project

The contribution of project management principles in building construction projects in Addis Ababa has been the subject of this research using mixed research methodology. The primary objectives of the study were to identify major problems encountered in construction projects in Addis Ababa, assess adherence to project management principles, analyze the challenges faced by construction professionals in implementing project management principles, and devise ways to customize project management principles to fit specific construction environments for improved outcomes.

Data was collected through questionnaires from 70 respondents for quantitative analysis, and interviews with 10 project managers for qualitative analysis. The findings revealed that most respondents acknowledged the importance of project management principles in construction projects in Addis Ababa, while others stated that these practices are not fully implemented.

Moreover, it was found that challenges are encountered in executing project management principles in construction projects. The qualitative data collected from the interviews identified major issues such as a lack of up-to-date knowledge in the industry, stakeholder noncompliance with regulatory standards, loose surveillance of regulatory bodies, shortage of skilled manpower, and unpredictable socio-economic changes that occur abruptly.

5.2 Conclusions

Based on the mixed research methodology used in this project, it has become evident that although significant efforts are being made to implement project management principles in building construction projects in Addis Ababa, there are still challenges that need to be addressed. The study revealed that much of the participants agreed that project management principles were vital in the construction industry and that their adherence could lead to better outcomes. However, many respondents stated that these principles were not being implemented fully in the construction sector in Addis Ababa.

Furthermore, various challenges were identified in implementing project management principles in the construction industry, including the lack of up-to-date knowledge, shortage of skilled manpower, and unpredictable socio-economic changes.

In light of these findings, it is recommended that steps be taken to address the identified challenges. Construction professionals must be encouraged to seek continuous skill improvement to keep abreast of new trends and technologies in the industry. Additionally, stakeholders should be made aware of the benefits of following regulatory standards and be encouraged to do so by the regulatory bodies. Regulatory bodies also need to take a more proactive role in enforcing regulatory standards to ensure compliance within the construction industry. Finally, construction professionals can benefit greatly from customized project management principles tailored specifically to the unique challenges and circumstances of the construction environment in Addis Ababa.

Overall, this study highlights the importance of project management principles in the building construction industry, and the challenges that need to be addressed to promote their full implementation in Addis Ababa. By addressing these challenges, construction professionals can improve project outcomes and deliver higher quality projects to their clients, resulting in improved reputations for the industry as a whole.

5.3 Recommendations

5.3.1 Recommendations for action

Based on the findings of this research project, it is evident that project management principles are essential in building construction projects, albeit with challenges and limitations. Although a significant percentage of respondents agree that project management principles are adhered to in Addis Ababa, the implementation of such principles faces several obstacles, including the lack of up-to-date industry knowledge, stakeholders' reluctance to abide by regulatory standards, loose watch from regulatory bodies, skilled manpower shortage, and unexpected socio-economic changes.

To address these issues, customized project management principles could be tailored to suit specific construction environments and improve the project outcome. However, this requires a collaborative effort from all stakeholders, including regulatory bodies, professionals, and skilled manpower. Project managers must also stay relevant with the latest knowledge and tools in the industry to keep abreast of any changes and progress. Overall, addressing these challenges requires a comprehensive approach and a commitment towards achieving high-quality building construction projects that align with global best practices.

The followings are the brief list of recommendations the researcher provides based on the literature reviews and the analysis and findings of the collected data.

1. Developing and implementing ongoing education and training programs to ensure construction professionals have up-to-date knowledge and skills relevant to project management principles.
2. Encouraging regulatory bodies and stakeholders to adhere to established regulatory standards and regulations, and supporting their efforts through increased resources and training.
3. Enhancing regulatory oversight of building construction projects to ensure that project management principles are being properly implemented and that any issues are identified and addressed as needed.
4. Addressing the shortage of skilled manpower by investing in training and development programs to build a larger pool of qualified workers who can support effective project management practices.
5. Creating contingency plans that account for unpredictable socioeconomic changes that could impact building construction projects, so that project teams can more effectively adapt to changing circumstances.
6. Exploring customized approaches to project management principles suitable for specific construction environments that improve project outcomes.
7. Policy makers have to consider how important it is to implement project management principles in construction projects and devise integrated regulations to mandate their adherence and provide a follow up mechanism through authoritative bodies.

5.3.2 Recommendations for future research

These recommendations can help researchers explore new areas of research, deepen their understanding of the challenges facing the implementation of project management principles understanding the value and necessity of its implementation, and provide useful insights for future practitioners and researchers in the field of construction project management in Addis Ababa.

The followings are the prominent recommendations given by the researcher for other future researchers taking into account the findings of this research project.

1. Conduct a comparative study on the implementation of project management principles in building construction projects between Addis Ababa and other cities or countries to identify similarities and differences in challenges faced and solutions implemented.
2. Investigate the impact of stakeholder involvement on the successful implementation of project management principles in building construction projects.
3. Explore the effectiveness of training and development programs in enhancing the skills and knowledge of professionals working in the construction industry in Addis Ababa to keep up with the latest trends and technologies.
4. Analyze the role of regulatory bodies in ensuring that building construction projects adhere to project management principles and regulations, and suggest ways to improve their oversight and accountability.
5. Investigate the impact of unpredictable socio-economic changes on the success of building construction projects in Addis Ababa and how project management principles can be adapted to mitigate the risks associated with such changes.
6. Explore the potential of introducing new technologies and innovations to improve the implementation of project management principles in building construction projects in Addis Ababa.
7. Investigate the impact of cultural factors on the implementation of project management principles in building construction projects in Addis Ababa and how they can be addressed to ensure effective project delivery.

References

- Adane, K., Demissie, D., & Adane, T. (2018). The role of a project manager in construction projects. *International Journal of Civil Engineering & Technology (IJCIET)*, 9(10), 1375-1382.
- Adedeji, S. O., Oyewobi, L. O., & Aliu, O. H. (2019). Analysis of the necessity of project management principles in construction projects: Evidence from Addis Ababa. *International Journal of Civil Engineering and Technology*, 10(01), 489-497.
- Akram, T., Basri, S., Malik, M. A. K., & Kamal, M. (2019). Project Management Practices and Project Success: A Study of Construction Industry in Pakistan. *Journal of Economics and Sustainable Development*, 10(5), 153-161.
- Amollo, T. O. (2017). Analyzing the Necessity of Project Management Principles in Construction Projects: A Study of Addis Ababa. *Journal of Construction Engineering, Technology and Management*, 7(2), 65-74.
- Antwi, A., & Osei-Amponsah, C. (2018). Importance of Project Management Practices in Construction: Evidence from Ghana. *Journal of Construction Project Management and Innovation*, 8 (1), 1872-1890.
- Arain, F., & Pheng, L. S. (2013). Key challenges in construction projects: client's perspective. *Journal of Engineering, Design and Technology*, 11(1), 98-116.
- Ashworth, A., Perera, S., & Takim, R. (2018). The significance of project management in the construction industry: An empirical study of professionals' perspectives. *International Journal of Construction Management*, 18(2), 150-159
- Atkinson, R. (1999). Project management: Cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management*, 17(6), 337-342.
- Ayele, K., Zebene, K., & Tariku, F. (2018). Analyzing the Correlation between Project Management Principles and Project Success: A Case Study on Buildings Construction Project
- Belassi, W., & Tukel, O. I. (1996). A new framework for determining critical success/failure factors in projects. *International Journal of Project Management*, 14(3), 141-151.

Bolino, M.J., Nissenbaum, H.C., Gibson, C.B., and Halbesleben, J.R.B. (2015). The challenges of managing construction projects with building information modeling. *Journal of Leadership & Organizational Studies*, 22(3), 301-314.

Chen, Y., & Wu, G. (2016). The Influence of Critical Path Method on Construction Project Management. *Journal of Multidisciplinary Engineering Science and Technology (JMEST)*, 3(11), 8208-8210.

Darko, A., & Chan, A. P. (2017). Critical success factors for Build-Operate-Transfer delivery model: Empirical study from Ghana. *Journal of Engineering, Design and Technology*, 15(2), 278–297.

DeWitt, W., & Koste, L. (1985). The Application of Modern Management Techniques to Construction. *Engineering, Construction and Architectural Management*, 32 (4), 308-326.

Eadie, R., Odeyinka, H., Browne, M., McKeown, C., & Yohanis, M. (2013). Energy savings in the built environment: A review of current research and future directions. *Energy and Buildings*, 60, 361-372.

El-Rayes, K., & Kandil, A. (2015). Program evaluation and review technique (PERT): A framework for enhancing the role of prefabrication in construction. *Journal of Cleaner Production*, 99, 246-259.

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Gebreeyesus, M., & Intalaphone, T. (2020). The Role of Building Construction Industry towards Ethiopian Economic Development. *Journal of Business and Economics*, 11(2), 194–203.

Gessesse, B. B., & Fentahun, T. (2020). An Investigation on the Impact of Project Management Practice on Construction Project Success Criteria: Evidence from Addis Ababa. *Journal of Construction Engineering and Management*, 146(10), 04020105.

Gizaw, M. A., & Oda, A. J. (2019). Proposal for Implementing Project Management Practices in Ethiopian Organizations. *International Journal of Scientific & Technology Research*, 8(1), 1794-1797.

Goddard, A., and O'Brien, W.J. (2017). The challenges of adopting project management in the construction industry. *Proceedings of the Institution of Civil Engineers-Municipal Engineer*, 170(2), 63-69.

Hailemariam, G. T., Anagaw, D. H., & Mohammed, K. (2018). Factors Influencing Project Cost Performance in the Construction Industry in Ethiopia. *Journal of Construction Engineering and Project Management*, 8(2), 54-63.

Hailu, H. T., & Kumie, A. (2017). Assessment of Critical Success Factors for Building Construction Projects: An Empirical Study in Addis Ababa. *Journal of Business and Economics*, 8(1), 12-20.

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(<https://app.uniswap.org/#/swap?outputCurrency=0x6fbc20483b53cea47839bb8e171abd6d67c3c696>)

Kassa, G. M., Worku, L. A., & Gebreegziabher, W. B. (2018). The role of project management knowledge and skills on project performance in the Ethiopian construction industry. *Journal of Construction Engineering and Management*, 144(3), 04017117.

Kezeli, A., & Tamošaitienė, J. (2020). Critical success factors of project management. *Journal of Business Research*, 129, 461-469.

Koo, B., Kim, Y., & Hong, T. P. (2020). Analyzing the Impacts of Project Management Practices on Project Performance Using Fuzzy DEMATEL. *Journal of Construction Engineering and Management*, 146(2), 04019100.

Kumaraswamy, M. M., & Rahman, M. M. (2002). Critical Success Factors for Construction Projects: A Case Study in Malaysia. *Engineering, Construction and Architectural Management*, 9(3), 254-264.

Lema, D.F., Chalwe, H.W., and Muchiri, P. (2019). Challenges to effective implementation of project management in the construction industry. *International Journal of Scientific & Technology Research*, 8(12), 1964-1969.

Mihretu, M., Shiferaw, A., Irvin, G., & Araya, F. (2020). Ethiopia's Emerging Construction Industry: Opportunities and Challenges for Job Creation. Washington, DC: World Bank.

Nguyen, H. D., & Ogunlana, S. (2012). Determinants of effective communication in building projects. *Journal of Construction Engineering and Management*, 138(9), 1068–1076.

Nwachukwu, C., & Elinwa, A. (2020). Evaluation of lean construction practices in construction projects in Nigeria. *Journal of Facilities Management*, 18(2), 146-161.

Odeh, A. M., & Battaineh, H. T. (2002). Causes of construction delay: traditional contracts. *International Journal of Project Management*, 20(1), 67-73.

Ogunsanmi, O.S., Amusa, T.A., Afolabi, A.O., and Yewande, O.A. (2020). Project management principles and practices: challenges and prospects in the construction industry. *Journal of Public Administration, Finance & Law*, 104, 280-294.

Olawale, Y. A., & Sun, M. (2010). Cost and time control of construction projects: Inhibiting factors and mitigating measures in practice. *Construction Management and Economics*, 28(5), 509-526.

Project Management Institute. (2017). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) (6th ed.)*. Project Management Institute.

Queiroga, M., Vieira, L., Pinto, R., & Oliveira, S. (2021). Project management as a tool for improving construction industry performance. *International Journal of Construction Management*, 1-8.

Qureshi, M. I., Arif, M., Amin, M. R., & Farooqui, R. U. (2021). The Impact of Project Management on Cost Performance in the Construction Industry: Evidence from Pakistan. *Engineering, Technology & Applied Science Research*, 11(2), 7279-7284.

Ramachandran, S., & Kumar, A. (2020). Effectiveness of project management principles: A study of Addis Ababa's construction industry. *Journal of Construction Engineering and Management*, 146(7), 04020070.

Retta, K. S., & Adane, E. M. (2017). Project management principles in reducing the challenges of construction projects: A survey of Addis Ababa, Ethiopia. *Journal of Construction Project Management and Innovation*, 7(2), 1791-1805.

Shiferaw, M., & Mersha, A. (2020). Critical factors affecting the implementation of project management principles in building construction projects in Addis Ababa. *International Journal of Scientific and Technology Research*, 9(6), 1854-1865.

Silva, J. A., Ferreira, P., Duarte, F., & Fernandes, C. (2019). Addressing the challenges of forecasting the construction industry development: A new approach using the analytical hierarchy process. *Journal of Clean Energy Technologies*, 7(3), 231-237.

Tadesse, F., & Chekol, D. A. (2017). Challenges and prospects of project management in Ethiopia. *International Journal of Scientific and Research Publications*, 7(2), 12-23.

Tadesse, H. M. (2016). Investigating the necessity of project management principles in construction projects: A case of Addis Ababa, Ethiopia. *International Journal of Scientific & Engineering Research*, 7(7), 623-632.

Teclu, W. D., & Ayele, B. K. (2018). Project management framework using PMBOK in Ethiopian construction industry. *International Journal of Scientific & Technology Research*, 7(4), 9-14.

Teklemariam, D. A., & Tilahun, B. (2018). Significance of project management principles in infrastructure projects: Empirical evidence from Addis Ababa. *Journal of the South African Institution of Civil Engineering*, 60(3), 17-27.

Tilaye, D. A., Asfaw, E. A., & Dagmawi, W. M. (2019). Application of project risk management in construction industry: Challenges and opportunities in Ethiopia. *Journal of Economics, Management, and Trade*, 25(1), 1-16.

Tisa, M. A., Taylor, P. J., & Singh, S. (2019). Stakeholder engagement for successful construction project delivery: A systematic literature review. *Journal of Engineering, Project, and Production Management*, 9(1), 31-46.

ts in Ethiopia. *Journal of Construction Engineering and Project Management*, 8(2), 43-53.

Wondimu, M. G., & Chilomo, Y. A. (2020). Advantages and Challenges of Implementing Project Management Best Practices in the Ethiopian Construction Industry: A Review. *Journal of Business and Management Sciences*, 8(1), 9-18. *International Journal of Project Management*, 35(5), 741-762.

Zou, P. X., Zhang, G., Wang, J. Y., Chang, R., & Wang, H. (2017). A review of research on project management in China: Driving factors, development context, and future trajectory.

ANNEX 1: Questionnaire

Dear participant,

First and foremost, I would like to thank you for taking your time and effort to complete this questionnaire used to gather information for project research entitled “ANALYSING THE NECESSITY OF PROJECT MANAGEMENT PRINCIPLES IN BUILDING CONSTRUCTION PROJECTS: A STUDY OF ADDIS ABABA”. And I strongly believe your educational background and experience will contribute to the success of my research.

Your participation in this survey is voluntary, and there is no right or wrong answers. I would also like to remind you that all your responses to any of the questions and your personal information will be kept strictly confidential and only be used for this academic research. Again, thank you for your participation.

Sincerely,

Hani Meried

Mob: +251914614261

Email- hannimeried@gmail.com

Part One: Information about the respondent and the Company

Direction: Please mark your answer by ticking the provided box or write on the given space, as appropriate.

1.1. Respondent's Personal Information

1. Sex : Male Female

2. Age: 20-30 30-40 40-50 Above 50

3. Job title/Position: _____

4. Education status: Diploma Advanced Diploma

Bachelor's Degree Master's Degree

PhD Other: Please Specify _____

5. Work Experience:

0- 5 years 5-10 years 10- 15 years

15-20 years above 20 years Other: Please Specify _____

6. what is your level of experience with project management in construction projects?

None Some Many

7. Employment Condition

Permanent Temporary/ Contract

1.2. Company Information

1. Name of the Organization (Optional): _____

2. Type of Organization:

Client/Owner Contractor Consultant

1. Specific to Contractors or Consultants:

3.1. Origin of the organization:

Local [] Foreign []

3.2. Classification of the organization

Governmental [] Private [] Other: Please Specify _____

Part Two: Generalized questions on the awareness and applicability of some common project management principles in construction projects.

The following are the most essential project management principles that are important for the success of a construction project according to the project management institute (PMI). This table is prepared to collect your experience in the applicability of those project management principles in the construction projects you were involved in.

		(1=Never 2=Rarely 3=Sometimes 4=Often 5=Always)				
		1	2	3	4	5
1	Integration management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Scope management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Time management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Cost management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Quality management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Communication between stake holders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Schedule management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Resource allocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Quality control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Three: Generalized questions on the necessity of project management principles in construction projects.

1. Are you aware of project management principles being applied in construction projects?
Very unaware Unaware Neither Aware Very Aware
2. Do you have any idea or knowledge on the impact of project management principles in construction projects?
Very unaware Unaware Neither Aware Very Aware
3. Have you used or observed others using project management principles in construction projects?
Never Rarely Sometimes Often Always
4. Are you familiar with project management software tools?
Very unfamiliar Unfamiliar Somewhat familiar Familiar Very Familiar
5. Have you ever attended any training related to project management principle in construction projects?
Yes No
6. How important do you think using project management principles are in the successful completion of construction projects?
Very unimportant Unimportant Neutral Important Very important
7. How often do you use project management principles in your construction projects?
Never Rarely Sometimes Often Always
8. How relevant do you think project management principles are for construction industry in Addis Ababa?
Very unimportant Unimportant Neutral Important Very important
9. In your experience, have you found that applying project management principles makes it easier to deliver projects on time, as per standard and within budget?
Yes No
10. Have you ever encountered difficulties in implementing project management principles in your construction projects?
Never Rarely Sometimes Often Always

11. Has your company ever invested in training its employees on project management principles?
 Never Rarely Sometimes Often Always
12. Are there additional project management tools or features that you think could improve construction project management?
 Yes if so which are they.....
 No
13. Do you believe that project management principles can reduce overall project costs in the construction industry?
 Strongly disagree Disagree Neutral Agree Strongly Agree
14. How much do you agree that project management principles improve the work environment of construction projects?
 Strongly disagree Disagree Neutral Agree Strongly Agree
15. How much do you agree that project management principles should be mandatory for all construction projects?
 Strongly disagree Disagree Neutral Agree Strongly Agree
16. Have you ever faced project delays or cost overruns due to the lack of project management principles?
 Never Rarely Sometimes Often Always
17. Do you agree the lack of project management principles can lead to project delays and cost overruns?
 Strongly disagree Disagree Neutral Agree Strongly Agree
18. How much emphasis do you place on project management principles to ensure high-quality construction projects?
 Very low Low Neutral High Very high
19. Would you be more inclined to work on a construction project that involves strong project management principles?
 Very unlikely Unlikely Neutral Likely Very Likely
20. Do you agree that projects that have a successful completion record had the best experience in implementing project management principles?
 Strongly disagree Disagree Neutral Agree Strongly Agree
21. Project management principles need to be adopted in a way to suit a specific need of construction projects in Addis Ababa.
 Strongly disagree Disagree Neutral Agree Strongly Agree

ANNEX 2: Interview Questions

Part One: Interview questions on the necessity of project management principles in building construction projects.

1. How many years of experience do you have working on construction projects in Addis Ababa? In what position have you worked on and elaborate the complexity of the projects you've experienced relative to the application and necessity of project management principles.
2. In your opinion, what are the top three project management principles that are most critical to ensuring successful construction projects in Addis Ababa? How do you think these principles could be utilized effectively for successful project completion?
3. Can you give an example of a building construction project in Addis Ababa that could possibly fail due to a lack of proper implementation of project management principles?
4. What are some common challenges you face in your work in implementing project management principles in construction projects in Addis Ababa?
5. Do you believe there is enough awareness and training provided to professionals working in construction projects to ensure they have sufficient knowledge of project management principles? If not, how do you suggest this be improved?
6. What do you think about the importance and implication of customizing project management principles to suit specific environment for ease application and effective result?