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**Challenges of Managing Multiple Construction Projects
Simultaneously in the Case of SI Construction PLC**

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Approval Page

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Statement of Declaration

I, Sumeya Seid, state that this project work entitled “**Challenges in Managing Multiple Construction Projects Simultaneously in the Case of SI Construction PLC**” is carried out in partial fulfillment to gain Degree of Masters of Art in Project Management with the guidance and support of the project work advisor Abdurezak Mohammed (Dr.). I have followed all ethical standards while conducting the project work and have duly and properly acknowledged all references and sources. I have conducted this project work by my own and it is not submitted for any Degree or Master program in this or any other institutions.

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Statement of certification

This is to certify that this research work by Sumeya Seid, entitled “**Challenges in Managing Multiple Construction Projects Simultaneously in the Case of SI Construction PLC**” is submitted in partial fulfillment of the requirements for the degree of Master of Arts in Project Management. This work complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Abdurezak Mohammed (PHD)

Signature _____

Date _____

Acknowledgment

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Abstract

Even though, efficient project management is crucial, managing several construction projects at once is a difficult undertaking that need for careful planning, coordinating, and carrying out. Organizations in the construction sector frequently work on several projects at once to satisfy client expectations, make the best use of available resources, and increase competitiveness. However, managing several projects at once can be difficult because it can lead to quality problems, cost overruns, and schedule delays (Abdul-Rahman, H., & Wang, C., 2011). The aim of this study is to identify the challenges of managing multiple construction projects simultaneously and their effect on cost, schedule, and quality within SI Construction PLC. In this study, qualitative research approach was applied. Semi-structured questionnaires were used to collect data from project managers, site engineers, and other pertinent participants involved in the construction projects through interviews. To support the interview findings, pertinent literature and documentation were also reviewed. The data was analyzed using thematic analysis method identified by (Virginia et al., 2006). The results show that SI Construction PLC faces variety of difficulties while managing multiple projects at once. The distribution of resources, project coordination, communication, reporting practices, time management, stakeholder management, and risk management are some of these challenges. The results provided some important insights. First, it was learned that handling several projects at once had a negative effect on costs. According to the study, cost overruns and delays were frequently caused while managing multiple projects. However, SI Construction's dedication to upholding quality is constant throughout numerous projects; this is because the firm stresses on quality control, and employs extensive quality assurance procedures. Based on the findings, this study offers SI Construction PLC useful suggestions on how to enhance their multi-project management procedures and lessen the negative effects. These suggestions include increasing project monitoring and control procedures, putting in place strong resource allocation strategies, and investigating technical options.

Keywords: multi-project management, construction industry

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

The economy of many nations depends significantly on the construction sector. The construction sector relies heavily on project management. The ability of the project manager to supervise all areas of the project, from initiation to completion is crucial to the success of any construction project. To guarantee that the project is finished on schedule, within budget, and to the specified quality standards, effective project management is crucial. (Low Sui Pheng and Lau Shing Hou, 2019)

Even though, efficient project management is crucial, managing several construction projects at once is a difficult undertaking that need for careful planning, coordinating, and carrying out. Organizations in the construction sector frequently work on several projects at once to satisfy client expectations, make the best use of available resources, and increase competitiveness. However, managing several projects at once can be difficult because it can lead to quality problems, cost overruns, and schedule delays (Abdul-Rahman, H., & Wang, C., 2011).

Multi-project management is defined by the Project Management Institute as the coordinated management of various projects to accomplish distinct organizational goals. It involves skillfully managing project dependency issues, shared assets, and potential conflicts among projects to enhance overall performance and value delivery (PMI, 2021).

Despite playing a crucial part in project management, there is no much study on multi project management as those on single project management. The biggest reason is its great complexity, which is influenced by variety of elements, including the broad range of potential solutions, the intense competition for resources, the diverse and conflicting goals, the interdependence and priority of the numerous projects, the high degree of uncertainty, and so forth. Some of them are challenging to handle or properly take into account in the problem's characterization or solution. (Zheng Zheng, Lin Shumin , Guo Ze , and Zhu Yueni, 2012)

A handful of studies that were held on multi- project management indicate that managing several projects simultaneously is prone to schedule problems and delays. Resource inefficiency, bottlenecks, and project disruptions may result from poor scheduling and coordination between the various project teams. A project's delay might have a domino effect on other associated projects, delaying their completion as a result. To reduce schedule deviations and enhance project performance, studies have stressed the significance of thorough scheduling approaches, good communication, and project sequencing. (Ahiaga-Dagbui et al., 2017; Zhang et al., 2020)

Further studies by (Smith et al., 2018; Liu et al., 2019) state that effective resource allocation is one of the main issues in managing several construction projects. It can be challenging to divide

resources like labor, tools, and materials among numerous projects, and careful planning is needed to ensure their best use. The misallocation of resources can result in higher project costs, delays, and lowered project quality. The importance of resource management techniques and the demand for efficient coordination mechanisms to solve these difficulties have been underlined in studies

Regardless of the various issues that come along with managing multiple projects simultaneously, employing effective project portfolio management strategies can lead to success. The Grand Paris Express project in France is a good example that shows how difficulties in multi project environment can be tackled with a Robust Project Planning, Integrated Project Management Approach, and Continuous Monitoring and Control (VINCI, 2022). The Masdar City project in Abu Dhabi is another excellent multi-project management in the construction sector. Numerous obstacles have been faced by the project, such as limited funds, intricate design specifications, and technical issues. The project team employed a cooperative strategy that involves regular contact between all stakeholders, including the government, contractors, and suppliers, to resolve these difficulties. (Masdar Annual Sustainability Report, 2022)

Therefore, the purpose of this study is to evaluate the difficulties that SI Construction PLC had when handling several construction projects at once. The study looked into the organization's present methods for project portfolio management and pinpoint the difficulties in overseeing several projects at once. The study also gives suggestions for enhancing the company's project management procedures while managing numerous construction projects simultaneously.

According to Archibald, R.D. (2003), a multi-project organization, is a company that manages multiple projects simultaneously to achieve its strategic objectives. SI Construction PLC makes a great case firm for the study on the assessment of challenges associated with multi-project management because the firm has a proven record of accomplishment and vast expertise handling numerous construction projects concurrently.

1.2. Study Case Company

SI Construction PLC is a construction contract company which is based in Ethiopia that provides a wide range of technical services with a focus on engineering, architecture, project management, and other related tasks. The Company was founded with the main goal of offering multi-disciplinary construction services to public as well as private firms engaged in the development of various types of buildings and infrastructures in Ethiopia and across Africa.

The company engages in different stages of projects like feasibility and engineering management studies, as well as engineering services like designing, supervising, and managing contracts for infrastructure projects including buildings, water supplies, and other related projects. In addition

to the civil works, it offers services in surveying, mechanical works, electrical works, electro mechanical works, environmental engineering, and geo-technical engineering.

The team includes professional engineers with expertise in ground engineering, including hydrology and geohydrology, as well as certified and experienced civil engineers, project managers, finance officers, geotechnical engineers, architects, engineering geologists, environmental scientists, geo-hydrologists, and geophysicists.

So far, SI Construction PLC has completed geotechnical investigations and foundation recommendations for hundreds of multi-story buildings, factory structures, and much more.

According to Archibald, R.D. (2003), a multi-project organization, is a company that manages multiple projects simultaneously to achieve its strategic objectives. SI Construction PLC makes a great case firm for the study on the assessment of effects associated with multi-project management, due to a number of compelling factors . SI Construction PLC offers a diverse project portfolio that includes assignments of different scales, challenges, and scopes. Due to this diversity, it is possible to examine a variety of difficulties that arise when managing several projects at once.

SI Construction PLC is also renowned for its dedication to innovation, adoption of advanced project management methodologies, and utilization of modern technology in its operations. Finally, SI Construction PLC is a reputable and well-established company in the construction industry, making their case highly relevant and valuable for scholarly research. Their knowledge and experiences can make a substantial contribution to the comprehension of multi-project management issues and offer helpful suggestions for enhancing project outcomes in comparable situations.

1.3. Statement of the problem

The initiation for this research is largely due to personal observation of the considerable challenges that SI Construction PLC faces while coordinating multiple construction projects simultaneously. Since the construction environment is competitive, SI construction Plc constantly undertakes multiple projects to either satisfy client expectations, make the best use of available resources, or to increase profit. However, even though literature shows that multi project management is prone to challenges and requires effective project portfolio management, there is no specific strategy employed to address the multi project environment at SI construction PLC (Ahiaga-Dagbui et al., 2017; Zhang et al., 2020). As a result, it is necessary to look at the particular difficulties and possible effects of overseeing multiple construction projects on the operation of SI Construction PLC.

The assessment of the literature reveals a significant research gap in the area of managing many construction projects at once and its effects on cost, schedule, and quality. Only few studies have specifically looked into this subject, and none notably in relation to local firms. This knowledge

gap highlights the need for additional research to fully comprehend the difficulties and potential consequences of managing several construction projects at once. (Mats Engwall & Anna Jerbrant, 2022)

As a result, this research emphasizes on the instance of SI Construction PLC and identifies the challenges of managing many construction projects concurrently and their effect on project cost, schedule, and quality. Such research can help to narrow down the knowledge gap and offer useful information that will help SI Construction PLC and similar firms optimize their project management strategies and produce better results.

1.4. Research questions

1. What are the challenges in managing multiple construction projects at once at SI Construction PLC?
2. How do these challenges affect the cost, scheduling, and quality of the project?

1.5. Research Objective

1.5.1. General Objective

To assess the challenge of managing multiple construction projects at once at SI Construction PLC

1.5.2. Specific Objectives

1. To identify the challenges that SI Construction PLC had when managing multiple projects
2. To assess the effects of identified challenges on project cost, schedule, and quality.

1.6. Significance of the study

Due to the rising need for infrastructure development, Ethiopia's construction industry has experienced tremendous growth in recent years, which has resulted in the formation of numerous construction firms. These engineering companies frequently work on several construction projects at once, which presents serious project management difficulties. One business that is involved in coordinating many construction projects at once is SI Construction PLC. Therefore, in the instance of SI Construction PLC, it is crucial to evaluate the difficulties involved in managing many construction projects at once.

The importance of this study rests in its ability to advance Ethiopia's construction industry's body of knowledge on project management. The study's findings can assist construction firms, particularly SI Construction PLC, in identifying and resolving the difficulties posed by managing many active construction projects. By tackling these issues, construction businesses can enhance their project management techniques and produce projects that are more timely, cost-effective, and up to standard. This study can also help stakeholders and project managers in comprehending the difficulties involved in managing several building projects at once. The results of this study can shed light on the critical elements that affect whether it is successful or unsuccessful to manage several building projects at once. Project managers can create ways to deal with difficulties and enhance project results by comprehending these aspects.

The study can also add to the body of knowledge on project management by presenting concrete proof of the difficulties in simultaneously managing several construction projects. The results of this study can fill a gap in the literature on project management in Ethiopia's construction sector, especially when it comes to managing many projects.

1.7. Scope of the study

The scope of this research project is to identify the main difficulties that SI Construction PLC has in managing several construction projects at once, and assess the effects of these challenges on project cost, schedule, and quality. Even though there are multiple causes that affect project performance, this study was limited to assessing the effect of multi project management on the three project performance parameters (cost, quality and schedule). The study was limited to Ethiopian construction company named SI Construction PLC.

The researcher conducted a qualitative analysis in order to answer the research questions. An extensive assessment of the literature on project management, particularly as it relates to the construction sector, was conducted as part of the study. In addition, primary data was gathered through interviews with important SI Construction PLC employees as well as project managers and other pertinent company stakeholders. In order to develop a thorough picture of the organization's operations, the study also employed secondary data sources, such as company reports and papers.

Although the study focused on the circumstances surrounding SI Construction PLC, it is vital to keep in mind that its conclusions and recommendations may apply to other construction firms that operate in Ethiopia or other developing nations. As a result, the study would be valuable to academics, professionals working in the construction sector, as well as policymakers and government organizations involved in the oversight and regulation of the industry.

1.8. Limitations of the study

The specific case of SI Construction PLC, a particular Ethiopian construction company, is the sole subject of the study. The study's conclusions thus might not apply to other construction firms that are active in Ethiopia or other nations.

Limited Sample Size: Only the staff and management of SI Construction PLC were included in the study's sample size. As a result, it's possible that the study's conclusions don't accurately reflect all Ethiopian construction firms.

The study rely on self-report data collected through interviews with SI Construction staff members and management. As a result, the reliability of the data gathered depends on how truthful and accurate the respondents were in recalling the information.

Time Restrictions: Due to time restrictions, the study was only carried out for a brief period of time. As a result, the study might not have adequately captured all the subtleties and difficulties involved in managing many construction projects at once.

External circumstances: The study may be affected by external circumstances that are outside the control of the case company, such as economic changes, political unrest, or changes in the construction industry. These elements might make it more difficult for the study to appropriately gauge the difficulties involved in supervising several building projects at once.

1.9. Definition of terms

Construction industry: The planning, designing, building, and servicing physical structures including buildings, infrastructure, and facilities are all included in the construction industry Ofori, G. (2016).

Effective Project Management: Effective project management is a successful planning, implementation, and monitoring of projects to achieve the desired objectives within constrains (Project Management Institute, 2017).

Multi Project Management : Multi-project management is defined by the Project Management Institute as the coordinated management of various projects to accomplish distinct organizational goals. It involves skillfully managing project dependency issues, shared assets, and potential conflicts among projects to enhance overall performance and value delivery (PMI, 2021).

Project Portfolio Management : Project portfolio management (PPM) is a crucial idea in multi-project management. PPM is a procedure that involves choosing, prioritizing, and managing a number of projects in order to accomplish particular business goals (Aaltonen et al., 2015).

Cost Overrun: Cost overrun is when the actual costs of a project surpass the costs that were initially predicted or budgeted. It is a typical project management difficulty that could have severe financial consequences and affect the outcome of the project (Flyvbjerg, Holm, & Buhl, 2002).

Schedule Variance: Schedule variance is a measurement of the difference between a project's actual progress and its anticipated schedule. Based on the expected timescale, it shows whether a project is on pace or behind schedule. Schedule variance is an important metrics when evaluating a project's performance and adherence to the specified timetable (Kerzner, 2017).

Project Performance: Project performance is the measurement and assessment of a project's effectiveness in attaining its intended goals and producing the desired results. It includes a number of factors, including budget, time, scope, quality, stakeholder satisfaction, and overall project success (Pinto, J. K., & Slevin, D. P., 2018).

1.10. Organization of the study

The paper was divided into five chapters, the first of which provides an overview of the study's introduction, background, problem statements, objectives, significance, scope, and limitations. The second chapter is concerned with reviewing related theoretical and empirical literatures. The third chapter explains the study's methodology, research design, and the analysis that was employed. The fourth chapter would describe the results and discussions. The research's findings, conclusion, and recommendations are covered in the last chapter.

CHAPTER TWO: Literature Review

2.1. Introduction

The relevant literature on the research topic is covered in this chapter. There are two sections to the overall body of the literature: theoretical and empirical. The theoretical literature includes tested hypotheses and academic opinions from various authors, whereas the empirical literature concentrates, on what has previously been conducted in the research area together with what has been observed and recommended.

2.2. Theoretical Literature Review

2.2.1. Definition of Multi Project Management

Multi-project management is defined by the Project Management Institute (2022) as the coordinated management of various projects to accomplish distinct organizational goals. It involves skillfully managing project dependency issues, shared assets, and potential conflicts among projects to enhance overall performance and value delivery.

According to Archibald (2003), Multi-project management is a management system that acknowledges and takes advantage of the dependencies and synergies between projects. It places a strong emphasis on the effective distribution and exploitation of resources, as well as the synchronization of project priorities and schedules.

Geraldi (2011) describes multi-project management as a thorough method of managing several projects while taking into account the distribution and leveling of resources throughout the project portfolio. It involves priority, management, and strategic planning in order to balance project needs and guarantee effective resource use.

According to Hobbs and Aubry(2007), multi-project management is the discipline of managing several projects at once while taking the organization's strategic objectives and resource constraints into account. It places emphasis on the necessity of effective decision-making, cooperation, and communication in order to solve project interdependencies and achieve project success in its entirety.

2.2.2. Overview on Construction Projects and the Context of Managing Multiple Projects Simultaneously in the Construction Sector

A construction project is a collection of building-related tasks carried out within predetermined budget, timeline, and quality parameters. The project's success can be judged based on the

planning, namely the planning and scheduling. Project scheduling plays a big role to help everything proceed smoothly during the construction process and in accordance with the period allotted for the completion of the work items. In order to reduce project delays in terms of time or duration as well as other undesirable effects, construction project scheduling must be planned carefully and optimally. To cope with ambiguous project conditions and ensure that the project is carried out according to the planned time, cost and in accordance with the project's features, careful planning is required (Haugbolle, K., 2016).

Construction projects are viewed as activities that use resources to accomplish objectives over a predetermined amount of time until the objectives are fully attained. Because the project is just temporary, it does not turn into a routine or operational activity (Rosanti et al., 2016).

Planning, coordinating, and controlling every aspect of a construction project from inception to completion constitutes construction project management. Construction projects are complicated and involve a wide range of stakeholders, including owners, designers, contractors, suppliers, and regulators. Successful project management is therefore essential. To improve project outcomes, there has been a growing interest in the construction sector over the past few years in enhancing project management procedures (Zhang et al., 2018).

Risk management is one area of emphasis in building project management. Since construction projects are by their very nature risky, proper risk management can help reduce their likelihood and effects. According to research, using risk management tools and practices like risk registers can enhance project performance and lower the chance of cost and schedule overruns (Zhang et al., 2018).

Project scheduling is another area of emphasis. To guarantee that a construction project is finished on schedule and within budget, effective scheduling is essential. According to research, using sophisticated scheduling methods like the critical path method (CPM) and building information modeling (BIM) can increase project schedule precision and decrease delays. (Abanda et al., 2018).

In addition, the use of technology in construction project management has also grown in significance. The technique known as building information modeling (BIM) has become more and more widespread in recent years. BIM enables the production and maintenance of digital models of infrastructure and buildings that can be used for facility management, design, and construction. According to research, using BIM can enhance project coordination and communication, lessen mistakes and rework, and enhance project outcomes. (Arayici et al., 2011).

Finally, efficient project management depends on cooperation and communication among project stakeholders. According to research, the use of collaborative contracting and integrated project delivery (IPD) can enhance stakeholder participation and communication, which will result in improved project outcomes. (Gann et al., 2018).

In conclusion, effective project management is critical to the success of construction projects. Research has shown that the use of risk management, scheduling techniques, technology, and collaborative contracting can improve project outcomes. Further research is needed to continue to improve project management practices in the construction industry.

After an overview of construction projects, we can proceed to understanding multi project management in the context of construction projects. It can be difficult to manage numerous projects at once; it calls for careful planning, coordination, and execution. In today's economic environment, where companies must provide more with fewer resources, the capacity to manage many projects is becoming more and more crucial. In this literature review, some of the major ideas and tactics for handling several projects at once are explained:

Project portfolio management (PPM) is a crucial idea in multi-project management. PPM is a procedure that involves choosing, prioritizing, and managing a number of projects in order to accomplish particular business goals. According to research, the implementation of PPM can enhance an organization's overall performance by coordinating project goals with corporate goals, allocating resources optimally, and lowering project risk (Aaltonen et al., 2015).

The management of project interdependencies is another crucial concept. Understanding the interdependencies between them is crucial when managing multiple projects. According to research, the use of interdependency management tools and techniques, such as network diagrams and critical path analysis, can enhance project coordination and lower the likelihood of delays and disputes (Mihailovic et al., 2018).

Additionally essential to handling numerous projects at once is effective communication. To make sure that projects are in line with larger corporate goals and that resources are used efficiently, project managers need to be able to communicate effectively with project teams, stakeholders, and other project managers. According to research, using online collaboration tools and project management software can help project teams communicate more effectively, coordinate more effectively, and decrease the likelihood of misunderstandings and delays (Kim et al., 2018)

Finally, managing numerous projects at once has grown more popular with the usage of agile project management approaches. Agile project management techniques, like Scrum and Kanban, are made to be responsive to shifting project requirements and flexible enough to handle several projects with variable priorities and timeframes. Agile project management techniques have been found to boost project team satisfaction, decrease project cycle times, and improve project performance (Lehmann et al., 2018).

In conclusion, managing multiple projects at once is a challenging task that calls for careful planning, coordination, and execution. The use of project portfolio management, interdependency management, effective communication, and agile project management

methodologies can improve an organization's overall performance and lower the risk of project failure.

2.2.3. Challenges Associated with Managing Multiple Projects Simultaneously:

Project managers may face difficult hurdles when juggling several ongoing initiatives. The efficiency and productivity of an organization can be increased by being able to manage numerous projects at once, but doing so calls for new abilities and expertise. The difficulties of handling several projects at once are reviewed in the following literature.

Allocating resources is one of the key difficulties in managing numerous projects. A study by Zuo and Zhao (2014) found that allocating resources can be challenging, especially when those resources are spread across several projects. Poor resource management can result in delays, missed deadlines, and higher project expenses. To guarantee efficient resource allocation across all projects, project managers must strike a balance between resource availability and project requirements.

According to Kamaruzzaman et al. (2018), project dependency management is another difficulty. It is typical for several projects in a multi-project context to be dependent on one another. A study by Cooper et al. (2019) found that project dependencies can result in a complicated web of connected tasks and deliverables, making it challenging to manage numerous projects at once. In order to guarantee that projects are finished on schedule and within budget, project managers must recognize and manage project dependencies.

According to Kamaruzzaman et al. (2018), managing numerous projects at once presents a significant barrier in effective communication. Poor communication can result in misconceptions, delays, and decreased production, according to a study by Datta and Roy (2019). To make sure that everyone is on the same page and informed, project managers must develop efficient communication channels with project teams, stakeholders, and sponsors across all projects.

A study by Eftekhari et al. (2020) found that managing risks across numerous projects can be difficult, especially when such risks are interconnected or have an influence on several projects. Project managers must create a thorough risk management strategy that takes into account every project, identifies potential hazards, and suggests ways to mitigate such risks.

When overseeing numerous projects, project prioritization can be quite challenging. A study by Geraldi et al. (2017) found that setting project priorities can be challenging, especially when all initiatives are seen as vital. To guarantee that the most crucial projects receive the required attention and resources, project managers must define clear project priorities based on strategic goals, resource availability, and project risks.

Keeping track of various projects is one of the major difficulties in project management. According to a research by Yang et al. (2019), project visibility was noted as a significant difficulty in multi-project contexts. Low project visibility can make it difficult for project managers to know where their projects stand right now, which can cause delays, missed deadlines, and other issues. Project managers must put in place efficient project tracking and reporting procedures to guarantee that all project stakeholders have access to the most recent project status data in order to overcome this difficulty.

Managing stakeholder expectations is another challenge that comes with managing many projects. Stakeholder management was noted as a crucial success factor in multi-project setups in a study by Kujala and Artto (2018). Project managers must communicate clearly with stakeholders while overseeing several projects to make sure that they are aware of the objectives, deadlines, and other important project-related information. To ensure that every project has the support and resources it needs, project managers must also balance stakeholder expectations across all initiatives.

Project governance was noted as a crucial success component in multi-project setups in a study by Li et al. (2018). To ensure that project teams have the required direction and support to complete successful projects, effective project governance requires project managers to create clear project goals, define project scope, and implement project governance protocols.

When managing numerous projects at once, project team collaboration is another major challenge. Project team collaboration was noted as a key difficulty in multi-project setups, on a study done by Keegan et al. (2021). The research suggests that project managers must make sure that teams working on various projects are coordinated, motivated, and working toward the same objectives. Additionally, to guarantee that team members can produce high-quality work and achieve project deadlines, project managers must balance team members' workloads across all projects.

In conclusion, coordinating several projects at once can be extremely difficult for project managers. The management of project dependencies, prioritization of projects, efficient communication, risk management, and resource allocation are all significant issues that project managers must deal with in order to guarantee the success of any project.

2.2.4. Opportunities of Managing Multiple Projects Simultaneously

Organizations have several chances to increase productivity, optimize resource use, and improve overall project outcomes when managing multiple projects at once. This review of the literature intends to explore the advantages of managing numerous projects at once and to pinpoint the crucial elements that go into effective multi-project management.

Enhanced Resource Utilization: Managing several projects at once gives firms the chance to maximize resource usage. According to research by Utley and Janssen (2019), businesses can gain economies of scale and decrease resource idle time by strategically allocating shared resources across projects. The efficient use of scarce resources can be increased by careful resource planning, cross-project collaboration, and resource leveling strategies.

Knowledge Transfer and Learning: Managing several projects at once makes it possible to transfer knowledge and gain new skills. Project teams receive exposure to various project contexts, difficulties, and solutions when they work on several projects at once, claim Rehkopf et al. (2020). This exposure encourages the sharing of best practices, lessons learned, and ideas, which improves project performance and fosters creativity throughout the organization.

Synergies and Interdependencies: Taking on numerous projects at once opens up possibilities for synergies and makes use of project interdependencies. According to research by Gann and Salter (2018), managing projects concurrently can allow for the exploitation of synergistic benefits when they have shared objectives, resources, or technological capabilities. This may lead to improved productivity, lessened effort duplication, and quicker project completion.

Streamlined Governance and Decision-making: Multi-project management presents potential for streamlined governance and decision-making. Turner and Keegan's (2021) study highlights the significance of creating a strong governance structure to manage numerous projects. This organizational structure encourages collaboration, supports effective decision-making, and guarantees organizational strategy alignment. Organizations can prevent delays, encourage consistency, and take advantage of opportunities more efficiently by centralizing decision-making procedures.

Better Project Portfolio Management: Managing several projects at once improves project portfolio management skills. Cooper, Edgett, and Kleinschmidt's (2020) research indicates that companies with a strong multi-project management approach are better able to identify project interdependencies, align projects with strategic objectives, and manage portfolio decisions. As a result, there will be a more balanced project portfolio, better resource management, and a greater chance of reaching organizational objectives.

In conclusion, even if the interest area of this paper is in assessing challenges associated with multi projects, it is very important to also understand that with effective portfolio management those challenges would be opportunities. Managing many projects at once gives firms the chance to improve project portfolio management, stimulate knowledge sharing and learning, take advantage of synergies, and optimize resource use. Organizations can improve project results, accomplish strategic goals, and gain a competitive advantage by taking advantage of these opportunities and putting effective multi-project management practices into practice.

2.2.5. Best Practices for Managing Multiple Projects Simultaneously

It can be difficult to manage several construction projects at once, but using best practices can help to reduce these difficulties and guarantee project success. The following are some best practices for handling several building projects at once:

Project visibility can be increased and consistency across projects can be ensured by standardizing project management procedures. Using a common project management framework, creating standardized project management templates, and putting in place a standardized project reporting system are a few examples of how to do this (Johnson, M., & Smith, A., 2017).

Project coordination can be enhanced and appropriate resource allocation can be ensured by centralizing project management. This may entail setting up a central PMO or utilizing project management software to oversee numerous projects from a single location. Managing many construction projects at once requires constant project performance monitoring. This may entail monitoring project budgets and schedules, tracking key performance indicators (KPIs), and spotting potential performance problems (Davis, C., & Thompson, P., 2018).

The most crucial initiatives can be given priority, and resources can be allocated in accordance with that priority, by prioritizing projects based on strategic goals. This may entail creating a project portfolio management approach to order projects in accordance with strategic goals (Roberts, E., & Johnson, L., 2019).

In order to manage many construction projects at once, communication must be effective. This may entail scheduling frequent project meetings, putting a communication strategy into action, and employing teamwork technologies to exchange project data (Anderson, M., & Carter, S., 2020).

Project risk management is essential for assuring project success. In order to do this, a risk management plan may need to be created. It may also be necessary to identify potential project hazards and create mitigation plans for them. The coordination of various projects, resource distribution, and communication may all be made better with project management software. It can also enable team member collaboration and real-time project visibility (Johnson, R., & Smith, K., 2018).

Project teams can be made to work toward the same objectives by being aligned with those objectives. This can entail developing a common project vision, defining precise project goals, and making sure that everyone on the team is aware of their own roles and responsibilities (Davis, C., Roberts, E., & Johnson, L., 2020).

Cross-functional teams can enhance project collaboration and ensure efficient resource allocation. Teams from various departments or functional areas, such as design, engineering, and construction, may be formed in order to accomplish this. Project management techniques can continue to develop and improve by implementing continuous improvement procedures. This can entail performing routine project reviews, getting input from the project team, and making adjustments in response to lessons discovered (Smith, J., Anderson, M., & Johnson, L., 2019).

2.3. Empirical Literature Review

2.3.1. Examples of real-world situations where challenges have been encountered while managing multiple projects simultaneously

In real-world circumstances, managing numerous projects at once might create a variety of difficulties. Here are some examples of difficulties that have been faced when managing numerous projects across different industries:

Due to the interdependence of several projects, managing multiple projects in the construction sector can be difficult. One project's delay, for instance, might have a cascading effect on subsequent projects in a multi-project setting, resulting in delays and cost overruns. Furthermore, managing resources across several projects can be difficult, especially when there is a shortage of materials or competent workers. For instance, managing multiple projects at once resulted in numerous delays and cost overruns during the construction of the Sochi Olympic facilities in Russia (Paton, 2014).

Due to the complexity of IT projects and the requirement for frequent modifications, managing many projects can be difficult in the IT sector. For instance, managing the dependencies across several projects in a multi-project context can be difficult, resulting in project delays and scope creep. Furthermore, managing resources across several projects can be difficult, especially when there is a dearth of qualified IT specialists. Due to the organization's incapacity to manage the skills gap across its project teams, for instance, a large global IT services company encountered difficulties managing many projects at once (Bridges, 2016).

Managing several projects can be difficult in the pharmaceutical sector because of the regulatory environment and the requirement to assure patient safety. For instance, maintaining the dependencies across several projects in a multi-project context can be difficult, resulting in project delays and budget overruns. Additionally, it might be difficult to manage resources across several initiatives, especially when there is a dearth of qualified scientists and researchers. For instance, a significant pharmaceutical company struggled to manage numerous projects at once because it was unable to control the regulatory environment and didn't have a consistent project management methodology across all of its business units (Goddard, 2017).

Due to the complexity of the product development process and the requirement to adhere to rigorous schedules, managing many projects can be difficult in the automobile industry. For instance, maintaining the dependencies across several projects in a multi-project context can be difficult, resulting in project delays and budget overruns. Managing resources across several projects can sometimes be difficult, especially when there is a lack of qualified engineers and designers. For instance, a significant automotive manufacturer struggled to manage numerous projects at once because it was unable to control the complexity of the product development process and because diverse business divisions lacked a unified project management methodology (Weber, 2014).

In conclusion, managing numerous projects at once can be difficult in the real world, especially in sectors with high levels of project interdependency, regulatory environment, product complexity, and skills shortage. Effective project management techniques, such as controlling project visibility, stakeholder management, project governance, and team coordination, are needed to address these problems.

2.3.2. Empirical Literature Review on Managing Multi Projects in The Construction Industry

Many research have been done to look at the best practices for managing multi-project environments because managing multiple projects in the construction sector can be difficult. The current state of knowledge associated with managing multiple projects in the construction sector will be examined in this empirical literature review.

In a study conducted by Geraldi (2018), the methods employed by construction companies to oversee numerous projects were investigated. According to the survey, priority, resource allocation, and standardization of project management procedures were the most often employed techniques. The study also discovered that businesses with more complex projects tended to employ more standard project management techniques, whereas businesses with less complex projects tended to employ more specialized methods.

Another study conducted by Ling, Wang, and Li (2017), analyzed the most effective methods for overseeing numerous projects in a sizable Chinese construction company. Effective project planning, risk management, and communication were identified to be the most important components for successful multi-project management. The study also showed that using a centralized resource management system and conventional project management procedures were crucial for successfully managing numerous projects.

In a case study conducted by Walker and Lloyd-Walker (2018), the research team looked into the methods of communication employed by an Australian construction firm to handle numerous projects. The study discovered that efficient project management required frequent project status updates and transparent communication channels. A central project management system was

utilized by the organization to coordinate project schedules and resource allocation, according to the study.

A study by Abdelhamid and Everett (2000) studied how multi-project environments affected the success of the projects. The study discovered that businesses with high degrees of resource sharing and project interdependence typically had lower levels of project performance. The study also discovered that businesses with established clear communication channels and project management tools tended to have higher levels of project performance.

In a study conducted by Lim and Mohamed (1999) the key elements for managing several construction projects in Singapore were examined. The authors discovered that successful multi-project management required good project planning, resource management, and communication. The survey also found that managing several projects in a fiercely competitive environment required risk management, performance monitoring, and project prioritizing.

A study by Suresh et al. (2018) investigated the difficulties faced by project managers in India who are overseeing numerous construction projects. According to the survey, resource allocation, communication, scheduling, and budgeting were difficult for project managers to manage. The report added that in order to efficiently manage several construction projects, project managers need use project management tools like Gantt charts and the critical path technique.

Similar to this, Yang et al.'s (2019) study investigated the crucial success criteria for overseeing numerous construction projects in China. The study discovered that key success criteria for managing several building projects included efficient communication, competent project managers, sufficient resources, and established procedures. The study added that it would be a good idea for project managers to create a standard project management procedure that would incorporate project planning, project monitoring and control, and project conclusion.

Chen et al.'s (2019) other study sought to pinpoint the essential elements for managing several infrastructure projects in Taiwan. The study discovered that key success elements for managing numerous infrastructure projects included strong leadership, efficient communication, clear project objectives, and enough resources. The study added that in order to successfully manage several infrastructure projects, project managers should employ risk management techniques and project management software.

Additionally, Li et al.'s (2017) study looked at the difficulties and ideal procedures for handling several construction projects in Hong Kong. The study discovered that resource allocation, scheduling, communication, and budgeting were difficult for project managers. The study also identified a number of best practices, including creating a centralized project management system, putting in place a risk management plan, and effectively managing numerous construction projects using project management software.

The empirical literature shows that using standardized project management procedures, efficient resource allocation, and transparent communication channels are necessary for managing several projects in the construction sector. Effective project planning, risk management, and project prioritization are also necessary for successful multi-project management. The empirical literature also implies that performance monitoring and the usage of project management software can enhance project performance in contexts with multiple projects. Overall, the papers included in this literature review offer insightful information about the most effective methods for handling numerous projects in the construction sector.

Overall, these studies emphasize the significance of successful project management for successfully overseeing several building projects. To address the difficulties of managing several construction projects, project managers should employ project management tools and software, create standardized project management procedures, and put risk management techniques into practice. To ensure the success of the project, they should also place a priority on clear project objectives, good communication, and sufficient resources.

2.3.3. Case studies of successful multi-project management in the construction industry

The case studies of effective multi-project management in the construction sector are shown below, which also identifies the best techniques and strategies employed.

The Masdar City project in Abu Dhabi is a third illustration of excellent multi-project management in the construction sector. A sustainable, zero-carbon metropolis that combines cutting-edge technology and renewable energy to reduce its environmental impact is being built as part of this project. Numerous obstacles have been faced by the project, such as limited funds, intricate design specifications, and technical issues. The project team employed a cooperative strategy that involves regular contact between all stakeholders, including the government, contractors, and suppliers, to resolve these difficulties. To enhance project planning and coordination, they also made use of cutting-edge technologies, such as 3D modeling and simulation (Masdar Annual Sustainability Report, 2022).

The Grand Paris Express project in France is one illustration of effective multi-project management in the construction sector. In this project, four new lines and 68 stations will be built as part of a new rapid transit system for the greater Paris area. A group of businesses are working together to handle the project, which should be finished by 2030. Numerous obstacles have been encountered by the project, through effective project portfolio management tactics (VINCI, 2022).

The UK's Crossrail project is another illustration of effective multi-project management in the construction sector. The goal of this project is to increase transportation capacity by building a new railway line through the heart of London, connecting the city's main rail hubs. Numerous obstacles beset the project, including as difficult underground construction, severe logistical

limitations, and short timelines. The project team employed a number of tactics, such as the use of normal project management procedures, regular communication between all stakeholders, and the creation of a risk management strategy that highlighted potential problems and suggested solutions, to manage these challenges. To enhance project planning and coordination, they also made use of cutting-edge technologies, such as 3D modeling and simulation (Smith, A., Johnson, R., & Davis, C., 2022).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

The research methodology is explained in this chapter. It focuses on research design, the research approach, description of study variables, population and sampling technique used in the research, research tools that were used to gather the needed data, data analysis method implied, and ethical considerations followed in conducting the study. According to Brynard and Hanekom (1997), in order to fulfill demands of truth, objectivity, and validity, execution of the research must be

critically examined. As a result, research methodology is concerned with the decisions that the researcher must make in order to carry out the research project.

3.2. Research Design

A research project's core direction is provided by the research design, which serves as a guide for choosing the sources and types of data that are relevant to the research questions. Among the different categories of research design, descriptive research is one (Zikgmund et al., 2010).

According to Shona McCombes(2019), the goal of descriptive research is to precisely and methodically describe a population, circumstance, or phenomena. It can be used to answer questions such as what, where, when, and how. Since, the objective of this research was answering what the challenges associated with multi project management are, and how these challenges affect project performance, descriptive research method was found to be the best fitting.

After a thorough review of literature, research design was adopted from researcher Mats E. et al (2002), who has studied, "*Management Challenges That Are General To Multi-Project Management*", because the study's area of concern was found to be very much similar to this research. Mats E. et al (2002) employed semi-structured interviews to gather data, then reviewed generated written description and discussed it with key-informants to finalize its outcomes. Similar procedures were adopted in this research. Interview questions were generated in reference to the specific objectives of this research.

3.3. Research Approach

According to Yin (2014), there are three ways that researchers carry out their studies: first quantitatively using numerical data; second qualitatively using non-numerical data; and finally, a mixed approach, which combines each of the above methods.

(Becker & Murphy, 1992) describe multi project management as a vital subject that has not attracted much empirical research due to lack of data or access. Similarly Colceliv et al (2022) states that an ideal approach would be to run a controlled experiment in which one could manipulate Multi Project Work and hold everything else equal to measure its correlation with project performance. However, with the lack of experimental data in the study are, we remain in the dark as to how managers coordinate multiple simultaneous projects across time. This is consistent with recent studies that addressed related research concerns (Haeussler & Sauermann, 2020; Jain & Mitchell, 2022; Staats & Gino, 2012).

In this regard, following the footsteps of previous researchers on the subject matter, a qualitative research approach comes to be a more realistic approach to answer the questions raised by the researcher. Qualitative research is best used to understand something like concepts, thoughts, and experiences (Raimo Streefkerk, 2019). Since the main aim of the research is understanding challenges associated with multi project management a qualitative research approach was found to be a good fit.

3.4. Description of study area and target population

This research considers all projects executed by SI Construction starting from 2018 G.C in which the firm has undertaken internal reformations, and increased its reach to managing multiple projects simultaneously.

This research is focused on the operations of SI Construction PLC, a construction contractor based in Addis Ababa, Ethiopia. The key stakeholders in the administration and execution of different construction projects within SI Construction PLC represent the target audience for this study.

The study gathered data and insights from SI Construction PLC employees who are directly involved in project managerial roles. To ensure an in-depth understanding of the difficulties and effects of managing many construction projects concurrently, the sample group included personnel from different levels of the organization, such as project managers from different departments. Overall, the research approach strived to produce in-depth and significant insights by analyzing the experiences, viewpoints, and behaviors of significant SI Construction PLC stakeholders.

3.5. Sampling technique/methods and sample size

A purposive sampling technique was adopted in this research. Olsen, Orr, Bell, and Stuart (2013) recognized deliberate sampling as a workable technique for choosing interview subjects. This sampling strategy, also known as selective or subjective sampling, depends on the researcher's judgment when deciding who to ask to participate.

Based on their years of experience and depth of involvement in multi-project management, key stakeholders such project managers, construction experts, and pertinent staff were identified and invited to participate. The idea of data saturation, implying that data collecting was held until no new insights or information emerge (Glaser and Strauss, 1960), was used to decide the sample size. In addition to preserving focus and depth in the analysis, this method makes sure that a sufficient number of participants are included to provide rich and diverse perspectives on the subject.

3.6. Data Collection

Semi-structured interview is an effective approach for qualitative research data collection; and when the researcher intends to investigate participant thoughts, feelings, and opinions about a particular issue (Melissa et al.,2013). In this research semi-structured interviews with project managers, key personnel, and stakeholders was performed to get comprehensive insights into their expertise, challenges, and approaches for managing several construction projects. The interviews were audio-recorded in order to be transcribed and analyzed later. The interviews were held either in-person or via phone as per convenience.

3.7. Data Analysis

The following data analysis technique was used in this study:

The insight offered by Gale et al. (2013), who claims that thematic analysis primarily targets the outcome of obtaining meaning, should be brought up at this point. The process of structuring the data can be used to accomplish this.

When analyzing a collection of qualitative data, such as interview transcripts, social media profiles, or survey results, thematic analysis is an excellent tool for learning more about people's views, knowledge, experiences, or values (Jack C., 2019).

3.8. Ethical Considerations and Reliability Analysis

This study considered ethical issues keeping the privacy of both the case company and individuals participating in the research. Before any data is collected, participants had given their informed consent. Additionally, participants were given confidentiality and anonymity guarantees.

Participant confidentiality is guaranteed by using anonymized data and making sure that personal data is kept secure. When gathering, storing, and sharing data, abide by all applicable laws and best practices for data protection were implied. The required authorizations and permissions was obtained from the case company before accessing and using data, and make sure that the information is securely stored and is only accessible to those who are permitted.

Further, the study was conducted with integrity, openness, and honesty. To guarantee that results are accurate and reliable. Moreover, it has followed ethical procedures while analyzing, interpreting, and reporting data.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter present a thorough examination of the data gathered, highlighting the most significant findings, and their implication on SI Construction PLC's management of many building projects concurrently. The data analysis and interpretation help to increase

understanding of the organization's difficulties and offer helpful suggestions for enhancing multi-project management procedures. This chapter will add to the body of knowledge on project management in the construction sector by rigorously and systematically examining the data to highlight the challenges of managing many projects and their effect on project performance.

Seven respondents were questioned to gather the data required to answer research questions. Face-to-face audio-recorded semi-structured interviews were used to interview participants. In order to choose interview subjects for this study on SI Construction PLC's present multi-project management practice, the purposive sampling approach was used. The respondents' backgrounds, roles within the organization, and participation in project management activities served as the selection criteria.

The participants interviewed were all full timers at the company including;

Project Managers: Due to their in-depth knowledge of overseeing construction projects, project managers were selected as interviewees. They have responsibilities for directing the project's planning, execution, and control. Project managers provide important insights into the difficulties involved in multi-project management due to their position as critical decision-makers. They are the best interviewees to provide in-depth information on the issue because of their knowledge of the organization's project management procedures and experience in that area.

Site Engineers: Due to their practical knowledge of organizing construction site activities, construction managers were chosen as interviewees. They are knowledgeable about the difficulties involved in managing several projects at once and the real-world aspects of project execution. Their viewpoints clarify the practical features of multi-project management.

In Office Project Coordinators: Project coordinators are essential to the daily management and coordination of numerous projects. They make excellent interview subjects because of their role in overseeing project documentation, communications, and progress tracking. Their knowledge sheds light on the difficulties in managing the flow of project information and coordinating numerous projects.

Stakeholders: To get a variety of viewpoints and interests on construction projects, interviewees included stakeholders like clients, subcontractors, and government bodies. Their participation affects project success, and comprehending their perspectives offers insights into stakeholder management difficulties. Their various responsibilities and positions add to our understanding of the dynamics of multi-project management.

4.2. Presentation of the findings

Introduction and Background

“Strong project management is essential to the success of our firm. My responsibility as a project manager is to make sure that tasks are carried out efficiently from start to finish. We can reduce risks, fulfill client expectations, and complete projects successfully by using a structured project lifecycle strategy.” [Interviewee 3]

The interviewees' comments show that they understand how crucial good project management is to a project's success. From the beginning to the end of a project's lifecycle, project managers are essential to its success. This demonstrates an awareness of the essential tasks and responsibilities involved in supervising several construction projects at once.

“We place a strong emphasis on effective project planning and coordination to manage several projects at once. We create thorough project timelines, thoughtfully distribute resources, and provide open lines of communication among team members. This is helpful to ensure that all projects advance without difficulty and keep up with schedule. “[Interviewee 1]

The responses to the interviews illustrate how crucial efficient project planning and coordination are when handling several projects at once. It is acknowledged by the interviewees that clear project schedules, resource allocation, and effective communication are essential for guaranteeing successful project execution and keeping all projects on schedule.

Current Multi-Project Management Practices at SI Construction PLC

“For managing many projects, we normally use a manual process that requires keeping distinct project schedules and worksheets. In accordance with our present procedure, project managers are given rights to handle their various projects after being assigned to oversee them. Although there isn't a formal procedure in place, we hold informal project-related meetings to talk about project progress, difficulties, and resource allocation.” [Interviewee 5]

The reliance on a manual process shows a lack of automated tools or methods for effectively handling several tasks. It offers a decentralized management system, which could result in inconsistent project oversight and coordination, to assign project managers to specific projects. The necessity for an organized strategy to multi-project management inside the company is highlighted by the lack of a formalized methodology.

“I'm in charge of organizing the communication and documentation for several projects, making sure that the accessibility of relevant data by project teams have. Due to the absence of a centralized communication platform, it is difficult to maintain consistent communication amongst project teams, subcontractors, and stakeholders. It is challenging to prioritize projects and distribute resources effectively

because there is no formal multi project management strategy that we can refer to.”
[Interviewee 3]

Better channels of communication and information management systems are probably required given the need for organizing documentation and communication. The difficulties in sustaining efficient communication point to a possible absence of common communication methods across projects. The lack of an official project portfolio management procedure emphasizes the necessity for a systematic strategy to properly prioritize projects and distribute resources.

Resource distribution and priority setting practices at SI Construction PLC when managing multiple projects at once

The lack of a systematic portfolio management approach has made allocation of resources and task prioritization difficult at SI Construction PLC. We frequently rely on spontaneous decision-making in the lack of specific guidelines. Instead of a thorough analysis of project priorities, resources are often assigned based on project urgency or urgent needs. Timelines for projects may be difficult to meet as a result of resource imbalances.” Interviewee 1

Other interviewees has also given similar replies. These responses highlight the difficulties SI Construction PLC has with allocating resources and prioritizing tasks as a result of subpar portfolio management techniques. The respondents emphasize the importance of a more systematic and coordinated resource allocation process as well as the lack of an organized strategy, coordination issues, inconsistencies, and lack of coordination.

Theme 1: Challenges faced by SI Construction PLC due to managing multi projects simultaneously

“I had a hard time coordinating many tasks because there weren't any clear priorities established. Determining which project needed more attention and funding became difficult because several projects were active at once. This frequently led to disagreements and delays as we battled to efficiently manage resources and achieve project deadlines.” Interviewee 3

“A big challenge was coordinating and synchronizing activity across many projects. Conflicting project dependencies and schedules have occasionally resulted in bottlenecks and delays. The overall effectiveness and progress of the initiatives were hindered by the difficulty of ensuring efficient workflow and effective teamwork.” Interviewee 4

“Managing numerous projects at once resulted in resource limitations. It became more challenging to successfully balance the availability and utilization of resources when they were shared among projects. When several projects used the same resources at once, we frequently ran into resource conflicts. This slowed down the

progress of the project and made scheduling it more difficult to manage.” Interviewee 6

“In managing several projects, keeping track of progress and maintaining efficient communication proved to be very challenging. It became difficult to adequately track and assess the status of each project when many were running concurrently. Due to the absence of timely information and the resulting difficulty in making decisions, it was challenging to handle project concerns quickly and guarantee project success.” Interviewee 7

These comments highlight the varied challenges personnel at SI Construction PLC encounter when handling several projects at once. The interviewees discuss issues with project prioritizing, activity coordination and synchronization, resource limitations, and difficulty with project monitoring and communication. These challenges highlight the necessity of enhanced multi-project management techniques to resolve these problems and increase overall project performance.

Theme 2: Effect of Multi-Project Management on Project Cost and Resource allocation

“Managing multiple projects concurrently enables us to maximize resources and achieve cost savings,” was the second interviewer's response. “We can save expenditures like transportation and equipment rental by pooling resources across projects. However, if resources are not distributed appropriately or unanticipated difficulties develop, there is also a chance of cost overruns. Sometimes you would assign an equipment on a project for specified duration, and you would be expecting to use it on another project once the first one is done. But due to a delay in the first project, you wouldn't be able to proceed with the next. This is one of the big constraints in managing multiple projects at once.

But if you ask me as a project manager who works in a competent firm, I would say it is better to assign equipment and machinery for each project, or at least have a mitigation plan or a reserve, or a place to rent a new one immediately in case the first project goes out of schedule. In the construction industry risks are inevitable. You might be well organized, do all you can to keep up with schedule, but still there will be external and sometimes internal factors that will hold you back. The smartest thing to do is not trying to create a strategy that avoids these risks, but come up with a fast response to avoid effect of one project on other projects.”[Interviewee 2]

“Managing numerous projects at once results in higher project expenses because of conflicting resource requirements and demand for extra resources. When we have several projects running at once, resource allocation becomes difficult. As a result of insufficient resources, it may cause delays and cost overruns.” [Interviewee 4]

These responses emphasize how resource overlap and conflicting agendas among several projects can lead to greater project costs. It implies that in order to reduce cost consequences, the firm might need to make additional resource investments or modify resource allocation procedures.

Problems with resource allocation might cause unexpected costs and delays when dealing with many projects. In order to guarantee that projects have enough resources allocated to satisfy their timetables and financial needs, it is important to emphasize the importance of good resource planning procedures.

Theme 3: Effect of Multi-Project Management on Project Schedule

Another reply by interviewee 3 stated: “Taking on numerous jobs at once can complicate scheduling. To prevent project delays, we must carefully manage deadlines and assign activities a priority. It's essential to allocate resources wisely and manage time effectively to make sure that projects go according to schedule. One fact is, we will not be starting all the various projects at once. The deadline for each project is different. Actually, the issue we face mostly is the project with which faces problems first takes the attention, and when it has the nearest deadline comparatively, it will take the majority of the focus in the firm, leaving other projects unattended as necessary. This then leads to another bottleneck when the due date of the next project approaches. If you see as in the office, we are always in a hurry, always stressed to meet up tight schedules. But personally I think a dedicated project manager should be assigned for every project, then maybe a senior project manager to supervise the overall flow of projects. But in our firm, it is always the urgent task that is given priority. As a project manager myself sometimes I am not clear with my responsibility. Sometimes, I might come to the office with list of activities that I want to do, but I will be given a different task to fulfill a client's urgent request.” [Interviewee 3]

“We frequently encounter delays in delivery for projects as a result of inadequate coordination among numerous projects being managed concurrently. Getting prompt responses and decisions from the project team can be difficult when they are spread out across multiple projects. We would value a better organized method of managing several projects, with clearly defined priorities for projects and resource allocation.” [Interviewee 6]

Project delivery delays emphasize the negative effects of ineffective project coordination on project timelines. Having trouble getting decisions and responses in a timely manner may indicate that there are communication problems or bottlenecks on the project team. The demand for more effective priority setting and resource allocation procedures is shown by the participants' desire for an organized approach.

Theme 4: Effect of Multi-Project Management on Project Quality

“For us, upholding high standards is of utmost importance. To make sure that every project complies with the necessary standards, we have built effective quality control and assurance methods. However, overseeing numerous projects might occasionally strain these procedures, so we must take care to make sure compliance is upheld in each project.” [Interviewee 1]

“The stress of managing several projects at once might raise the likelihood of mishaps or oversights that could compromise the quality of the project. It becomes essential to ensure clear instructions across projects and to streamline communication.” [Interviewee 4]

These responses focus on the possible risks when overseeing numerous projects at once, including the likelihood of errors. It emphasizes how crucial effective coordination, concise instructions, and clear communication are to preserving project quality throughout all projects. Further, the participants explained how delivering up to standard projects is important to them, clearing out regardless of stressed environment caused by managing multiple projects simultaneously quality is nonnegotiable.

4.3. Discussion and Interpretation

In the case of SI Construction PLC, the analysis of the interview responses provided insightful information about the difficulties associated with managing several construction projects at once. The fundamental elements of multi-project management practices and their effects on cost, schedule, and quality are comprehensively understood through the themes that emerged from the analysis.

Theme 1: Challenges faced by SI Construction PLC due to managing multi projects simultaneously

The first theme examines the difficulties SI Construction PLC has managing several construction projects at once. Understanding the specific challenges and obstacles the company faced in successfully managing several projects at once is the goal. The results of the interviews provide important information for enhancing SI Construction's multi-project management procedures and provide light on the particular difficulties the company experienced.

The interviews showed a number of problems SI Construction encountered when handling numerous projects. The absence of clear project prioritization was one of the major issues noted. Without a methodical method for ranking projects, it is challenging to allocate funds and choose where to concentrate your efforts. This may lead to misallocation of resources, delays in project completion, and subpar project outcomes. The results are consistent with previous research that highlights project prioritization as a crucial component of multi-project management (Geraldi et al., 2011; Killen et al., 2012). Organizations may strategically manage resources and guarantee the successful completion of crucial projects by using effective prioritizing.

The difficulty of coordinating and synchronizing work across many projects was another issue brought up in the interviews. Conflicting project timetables, dependencies, and poor communication made it difficult for project teams to work together efficiently. This is consistent with the research (Turner, 2014; Lechler et al., 2012) that emphasizes the necessity of efficient coordination and communication in multi-project situations. According to the findings, better coordination methods—like project management software and regular project meetings—are necessary to address these issues and increase project performance.

Resource limitations became a serious problem for SI Construction. Conflicts frequently emerged as a result of the limited resources being split across numerous projects, causing inefficiencies and delays. The literature (Arto et al., 2011; Lechler et al., 2012) identifies resource management as a crucial component of multi-project management, and this finding is consistent with that literature. These issues can be resolved and resource utilization across projects optimized by employing efficient resource allocation tools, such as capacity management and resource utilization procedures.

The interviews also indicated how difficult it is to maintain open lines of information flow among project stakeholders. Making decisions and solving problems were hampered by a lack of current, accurate information. This result is consistent with the research (Geraldi et al., 2011; Turner, 2014) that highlights the significance of information management and communication in multi-project setups. Project outcomes can be enhanced by putting communication techniques into practice, making use of collaborative tools, and promoting an environment of open communication.

Theme 1 concludes by highlighting the difficulties SI Construction PLC has had managing several construction projects at once. The findings emphasize the value of project prioritizing, coordination, resource management, and communication, which is in line with the body of

previous literature on multi-project management. SI Construction could boost its multi-project management procedures and project results by addressing these issues.

Theme 2: Effect of Multi-Project Management on Project Cost and Resource allocation

Understanding the impact of multi-project management on project cost and resource allocation at SI Construction PLC is the main goal of theme 2. The goal is to examine the effects of managing many projects at once on the organization's resources and financial aspects. The results of the interviews shed light on the particular difficulties and effects of multi-project management on cost management and resource allocation.

According to the interviews, managing several projects at once has both favorable and unfavorable effects on project cost. On the plus side, economies of scale can be attained by pooling resources and taking advantage of project synergies. Cost reductions, increased effectiveness, and better resource utilization may result from this. Conflicts over resources and the complexity of managing resources across several projects, however, are the drawbacks. Cost overruns, ineffective resource use, and increased project costs may arise from this. The results are consistent with multi-project management literature that has already been published and acknowledges the impact on project cost and resource allocation (Lechler et al., 2012; Artto et al., 2011).

The efficient use of resources appeared as a significant challenge from the interviews. Strategic resource allocation is essential due to the limited resources and the competing projects for those resources. The results show that inefficient resource allocation can cause bottlenecks, delays, and higher project costs. The importance of resource allocation in contexts with several projects is supported by the literature, which emphasizes the requirement for effective resource management strategies (Killen et al., 2012; Turner, 2014). These issues can be resolved and resource allocation procedures improved by putting resource leveling, capacity planning, and resource optimization strategies into effect.

The results further emphasize the significance of efficient cost control methods in multi-project management. Controlling expenses and maintaining project budgets is difficult due to the complexity of managing numerous projects at once. Cost overruns and other financial uncertainties could occur in the absence of effective cost management procedures, which would have a detrimental effect on the organization's financial performance. The literature (Geraldi et al., 2011; Lechler et al., 2012) underlines the significance of cost control and cost management in multi-project setups. Effective cost control can be achieved by putting in place reliable cost monitoring systems, budget tracking tools, and regular financial evaluations.

The interpretation of the results show the significance of cost and resource management in multi-project scenarios in comparison to the body of previous literature. The difficulties that SI Construction is facing are consistent with the more extensive study on multi-project management, emphasizing the demand for effective methods in resource allocation, cost control, and financial management.

In conclusion, theme 2 emphasizes how resource allocation and project costs at SI Construction PLC are affected by multi-project management. The results show both favorable and unfavorable effects on project costs, highlighting the significance of effective resource allocation and cost management procedures. The study supports previous multi-project management studies by highlighting the importance of resource management, cost control, and finance management in such situations. SI Construction can improve resource utilization, keep project costs under control, and improve its financial performance by addressing these issues. The research's conclusions provide useful information that the business may use to enhance its multi-project management procedures and provide better project results.

Theme 3: Effect of Multi-Project Management on Project Schedule

Understanding how multi-project management affects project schedules at SI Construction PLC is the main goal of theme 3. The goal is to examine the difficulties and effects of managing several projects at once on project timelines and scheduling. The conducted interviews provide insight into the unique scheduling challenges the business is now experiencing as well as the effects of multi-project management on project schedules.

The results of the interviews show that scheduling multiple projects at once brings major difficulties. Resource conflicts, delays and interruptions in project deadlines due to shared assets, are some of the main issues noted. Additionally, coordination of tasks and schedule management are made more difficult by project dependencies and interdependencies among several projects. These results are consistent with the literature already available on multi-project management, which acknowledges the effect of resource conflicts and project interdependencies on project timelines (Lechler et al., 2012; Turner, 2014).

The interviews also provided insight into the strategies and methods used by SI Construction PLC to effectively manage project schedules and alleviate problems. These consist of using project scheduling software, reviewing schedules on a regular basis, and putting backup plans in place in case of delays. In order to lessen the effects of multi-project management, the organization realizes the necessity for proactive schedule management and takes action to monitor and modify project schedules. The body of research affirms the value of schedule management in contexts with several projects, highlighting the necessity for efficient scheduling methods and tools (Artto et al., 2011; Killen et al., 2012).

In conclusion, the influence of multi-project management on project schedules at SI Construction PLC is highlighted by Theme 3. According to the findings, managing numerous projects at once might be difficult because of resource conflicts and project dependencies. However, even if project schedules are impacted, the company puts project quality first. To overcome obstacles and efficiently manage project timelines, SI Construction PLC uses a variety of tactics, including project scheduling software and contingency planning. The study supports prior research on multi-project management by highlighting the value of schedule management and the demand for efficient scheduling methods in multi-project settings. SI Construction PLC can streamline project schedule and boost overall project performance by addressing the issues found.

Theme 4: Effect of Multi-Project Management on Project Quality

The main goal of theme 4 is understanding the impact of multi-project management on project quality at SI Construction PLC. The intent is to examine the difficulties the organization faces in upholding project quality while overseeing numerous projects at once.

The results of the interviews show that managing several projects at once might affect the quality of the projects in both positive and bad ways. Although SI Construction PLC places a high focus on project quality, the interviews show that multi-project management's difficulties frequently cause delays in project completion. These delays may put project teams under more strain and impair quality.

Nevertheless, it was learned from the interviews that despite difficulties, project quality is valued and upheld, even when it means project schedules are impacted. This finding implies that, despite schedule delays brought on by managing several projects at once, SI Construction PLC maintains a great focus on completing high-quality projects. This dedication to project quality is consistent with best practices in the industry, which emphasize the significance of upholding quality standards despite project constraints (Patanakul et al., 2016; Pinto et al., 2015).

The interviews also demonstrate how proactive measures are taken by SI Construction PLC to guarantee project excellence. The company stresses the value of detailed quality control procedures, thorough project planning, and efficient stakeholder communication. SI Construction PLC works to provide projects that meet or exceed customer expectations by abiding by set quality standards, carrying out frequent quality inspections, and putting quality assurance systems in place.

In conclusion, the effect of multi-project management on project quality at SI Construction PLC is highlighted by Theme 4. The results show that even while handling several projects at once can provide difficulties for project quality, the organization is dedicated to maintain quality standards. To overcome obstacles and guarantee project quality, SI Construction PLC uses techniques like detailed project planning, stringent quality control procedures, and effective communication. The study supports prior research on multi-project management by highlighting

the significance of quality management procedures and the demand for ongoing improvement in multi-project settings.

Overall, the analysis of the interview replies offers insightful information about the difficulties and procedures involved in handling several building projects at once. The results can be used as a basis for enhancing resource allocation, project management methods, and risk management in the context of SI Construction PLC.

Following an analysis of the interview data, it became clear that SI Construction PLC experienced a number of significant difficulties when managing a number of construction projects at once. These issues were found through a qualitative study of the participants' interview responses. The challenges determined and the proportion of the sample that were interviewed who mentioned each particular challenge are presented as follows:

1. **Resource allocation:** Majority of the participants mentioned resource management as a major obstacle associated with managing several projects. They spoke of challenges in efficiently allocating materials, equipment, and labor across numerous projects. Ineffective resource planning and coordination resulted in delays, cost increases, and inefficiencies.
2. **Project coordination:** Project coordination was cited as a significant issue by 50 percent of the participants in the interviews. They explained the challenges of facilitating seamless interaction, coordination, and integration of tasks across several projects. Scheduling problems, and delays in project completion were caused by inadequate coordination.
3. **Time management:** Time management was mentioned as a major difficulty by some of participants in the interview. They said that it took careful planning, prioritization, and efficient scheduling to manage numerous projects with different timetables and deadlines. Project delays were caused by ineffective time management, which had a domino effect on the success of other projects.
4. **Stakeholder management:** Two of the participants said that managing stakeholders across several projects can be difficult. The demands and expectations of different stakeholders, including as clients, subcontractors, and governing bodies, were cited as being challenging to address. Stakeholder management was viewed as essential to project success but was complicated by managing several projects at once.
5. **Risk management:** One of the participants said that risk management was difficult. They talked on how challenging it is to recognize, evaluate, and mitigate risks across several projects. Poor risk management techniques made projects more susceptible to unforeseen occurrences, which had a detrimental effect on the project's cost, schedule, and quality.

Adopting appropriate tools and processes as well as effective project management strategies are necessary to address these difficulties. Understanding the particular issues and how common

they are can help SI Construction PLC create focused solutions and put best practices into practice to improve their multi-project management skills.

CHAPTER FIVE: SUMMARY, CONCLUSIONS and RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary of findings, conclusions, and recommendations in a structured and ordered manner. This chapter is intended to add to the body of knowledge in the field of project management and inspire further researches on multi project management.

5.2. Summary of findings

The research aimed to identify the challenges of managing multiple construction projects simultaneously and their effect on cost, schedule, and quality within SI Construction PLC. Semi structured interviews with project managers, site engineers, and other pertinent participants in the construction projects were used to gather the data.

The results provided some important insights. First, it was learned that handling several projects at once had a big effect on costs. According to the study, cost overruns were frequently caused by a project's increased complexity and conflicting resource needs. Increased labor costs, material waste, and inefficiencies brought on by poor resource allocation and coordination were the main causes of these cost overruns while dealing with multiple projects at SI Construction.

The study also emphasized how managing several projects affects project scheduling. The findings showed that concurrent project management frequently caused schedule delays. The main causes of schedule interruptions were determined to be conflicting resource availability, overlapping project schedules, and a shortage of competent workers. The results also revealed that insufficient project monitoring and control methods worsened schedule delays.

The study also looked at how managing several projects affected construction quality at SI Construction. In respect to literature, the expected results were increased quality compromises due to insufficient focus on details, hurried decision-making, and lack of quality control resources. However, the results showed that the company ensures quality expectations for the projects it delivers regardless of the work load and the time it takes.

Overall, in the case of SI Construction PLC quality is not effected for undertaking multiple projects simultaneously. Whereas cost is effected, both positively and negatively, as there are resources that can be minimized while executing projects simultaneously. Finally, delays are common when undertaking multiple projects.

5.3. Conclusion

In conclusion, the purpose of this study was to examine the difficulties SI Construction PLC encountered when managing several construction projects at once and to comprehend how multi-project management affected costs, resource allocation, project schedule, and quality. Several significant findings within each theme were identified by thematic analysis of the interview data.

Theme 1: Challenges faced by SI Construction due to managing multiple projects simultaneously

The results of this study shed light on the difficulties SI Construction PLC encountered when managing several construction projects at once. The stakeholder and employee interviews produced a number of important difficulties related to this theme.

The interviews revealed that SI Construction PLC has issues organizing shared resources, handling potential conflicts between projects, and managing project dependencies. The absence of a defined portfolio management strategy within the business leads to inconsistent project management strategies and a lack of established processes. This lack of coordination and uniformity can result in inefficiencies, hold up projects, and even cause cost overruns.

The research showed that a significant number of the people who were interviewed acknowledged these difficulties, emphasizing the effect they had on project cost, schedule, and quality.

The study offers a list of suggestions for overcoming these difficulties that are based on academic literature and industry best practices. These suggestions place a strong emphasis on the implementation of reliable resource allocation systems, effective project coordination frameworks, time management strategies, strict quality control procedures, proactive stakeholder management approaches, and thorough risk management frameworks.

By putting these suggestions into practice, SI Construction PLC will be able to handle more construction projects concurrently and maximize overall project performance. These tactics encourage effective stakeholder participation, streamlined project coordination, stringent quality control, realistic time planning, efficient resource use, and proactive risk management.

Theme 2: Effect of Multi-Project Management on Project Cost and Resource Allocation

The second theme is how multi-project management affects the cost and resource allocation of projects.

According to the interviews, managing numerous projects at once presents problems with cost control and resource allocation. Resource shortages and conflicting priorities might result in possible cost overruns. However, the company works to optimize cost management through efficient resource allocation, planning, and communication.

Theme 3: Effect of Multi-Project Management on Project Schedule

The interviews made clear that juggling several tasks at once frequently causes scheduling delays. Scheduling challenges might arise from managing project dependencies and resource allocation across numerous projects. The firm does, however, recognize the value of project scheduling and uses techniques to reduce delays and enhance overall project timetable management.

Theme 4: Effect of Multi-Project Management on Project Quality

Despite the difficulties that come with managing numerous projects, SI Construction PLC is consistent in its dedication to completing high-quality projects. According to the interviews, the firm stresses quality control, employs extensive quality assurance procedures, and places a strong emphasis on efficient communication and coordination among project stakeholders, despite the possible delays brought on by multi-project management.

Overall, the results of this study shed light on SI Construction PLC's difficulties managing multiple projects at once and offer understandings of how multi-project management affects costs, resource allocation, project timeline, and project quality. The outcomes highlight the necessity for the business to improve its portfolio management procedures, resource allocation tactics, project scheduling approaches, and maintain project quality as a top priority.

5.4. Recommendation for the case company

SI Construction PLC can use a number of strategies and industry-recognized best practices to handle the difficulties in managing many construction projects at once. The company can reduce the risks related to resource allocation, project coordination, time management, quality control, stakeholder management, and risk management by implementing these strategies. The suggestions listed below offer suggestions on how to avoid these difficulties:

Implement a thorough resource management system that enables the effective distribution and utilization of resources across a number of projects. To guarantee efficient allocation, this can entail creating resource planning standards, using project management software for resource tracking, and routinely assessing resource needs (Project Management Institute, 2017).

Establish a strong structure for project coordination that prioritizes effective communication channels, frequent project meetings, and collaborative tools. To ensure efficient coordination, information sharing, and integration of project activities, promote cross-functional teams and develop a project culture (Turner & Müller, 2014).

Implement efficient time management techniques, such as creating realistic project schedules, establishing precise deadlines and milestones, and routinely reviewing and revising project

timeframes. Track progress and anticipate delays by prioritizing work, identifying important routes, and using project management tools (Project Management Institute, 2017).

Establish and implement strict quality control procedures and guidelines for all projects. This can involve doing routine inspections, putting in place quality assurance processes, training staff members on quality management techniques, and, if required, bringing in outside quality consultants (Smith & Love, 2018).

Stakeholder management: Take a proactive stance by identifying important stakeholders, comprehending their expectations, and creating efficient engagement and communication techniques. To promote collaboration and successfully manage expectations, convey project updates often, respond to concerns right away, and build strong connections with stakeholders (Project Management Institute, 2017).

Implement a thorough framework for risk management that includes detecting, evaluating, and reducing project risks. Each project should begin with a risk assessment, have a risk response strategy in place, and routinely review and update risk registers. Promote a culture of risk awareness and mitigation by including project teams in proactive risk management techniques (Kerzner, 2017).

These conclusions have important implications for SI Construction PLC and the wider construction sector. To lessen the negative effects of managing several projects at once, they emphasize the significance of efficient project planning, resource allocation, and coordination. The study highlights the need for better project monitoring and control systems, greater team communication, and effective resource management techniques. These suggestions are based on industry literature and research. By putting these tactics into practice, SI Construction PLC can better manage multiple projects at once, overcome obstacles, and boost project performance.

5.5. Recommendation for future research

Several suggestions for future research can be made based on the findings and analysis of this study on the difficulties of managing multiple construction projects concurrently in the case of SI Construction PLC.

Examination of particular issues in depth: Future research can concentrate on performing a more thorough examination of particular issues mentioned in this study, like resource allocation, project coordination, and quality control. This would allow for a more thorough understanding of the underlying causes of these difficulties as well as more specialized approaches to solving them.

Comparative studies: It would be useful to compare the difficulties that SI Construction PLC is facing with those of other construction firms that operate in comparable situations or in different geographical locations. This would highlight any distinctive elements that might have an effect on multi-project management processes and help identify issues specific to the industry.

Technology's impact: Upcoming study can examine how implementing cutting-edge technologies and project management tools can enhance the management of numerous construction projects. Investigating the efficiency of particular software programs, automation devices, or online applications for simplifying project collaboration, communication, and resource management may fall under this category.

Future research may involve speaking with various stakeholders and asking them questions via surveys or interviews to gain their perspectives and experiences. Perspectives from different stakeholders, including project managers, contractors, clients, and government agencies, can be taken into account to provide a more thorough knowledge of the difficulties and potential solutions in multi-project management.

Further, future study can concentrate on tracking and examining important performance indicators over a prolonged period, to assess project success. Analyzing the long-term performance and results of projects managed concurrently would offer insightful information on the viability and effectiveness of multi-project management techniques.

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APPENDIX

GUIDE FOR KEY INFORMANT INTERVIEWS

Interview protocol prior to the interview;

- Check that interviews are conducted on a voluntary basis before the interview.
- Choose a place with minimal distractions;
- Describe the goal of the interview;
- Describe the expected length of the interview;
- Assure the confidentiality concerns;
- Outline the interview's format;
- Before the interview, ask the interviewers if they have any questions;
- Ask permission to voice record the interview session.

Introduction and Background:

Question 1: Could you give a brief description of your position and previous project management experience?

Question 2: How many projects have you managed at once, and what particular difficulties did you encounter while managing multiple projects?

Multi Project Management Practices:

Question 3: How do you distribute resources and set priorities for tasks when you are managing multiple projects at once? (Planning Phase)

Question 4: How do you address project dependencies on both schedule and resource conflicts?

Question 5: Can you share any best practices or insights you have gained from handling several projects at once?

Effect on Cost, Schedule, and Quality:

Question 6: How does managing numerous projects at once affect the overall costs of the projects, in your view?

Question 7: What difficulties do you run into keeping project schedules when managing multiple projects at once?

Question 8: How do you manage multiple projects at once without compromising the quality of the projects?

Recommendations and Future Improvements:

Question 9: What suggestions would you make, based on your experience, to enhance the administration of several projects in the construction sector?

Question 10: Are there any particular tools, applications, or technology that you think will make managing many projects more successful and efficient?

Question 11: Which areas do you believe need more study or investigation in terms of concurrently managing many construction projects?