

**ASSESSMENT OF THE TOP MANAGEMENT
SUPPORT FOR CONSTRUCTION PROJECTS IN
SRI LANKA**

**MASTER OF SCIENCE
IN
CONSTRUCTION PROJECT MANAGEMENT**

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SUPPORT FOR CONSTRUCTION PROJECTS IN
SRI LANKA**

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This thesis is submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirements for the Master of Science in Construction Project Management

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Declaration

I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any university to the best of my knowledge. I believe it does not contain any material previously published, written, or orally communicated by another person or myself, except where due reference is made in the text.

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.....

Date

Abstract

This study examines the significance of Top Management Support (TMS) for project success, particularly within Sri Lanka's construction industry. Its objectives encompass examining the association between TMS and project success, identifying effective TMS practices, grasping the challenges faced by TM professionals and strategies to address them in the construction field.

The research methodology involves an extensive literature review, questionnaire development, data collection, and analysis techniques like descriptive statistics, correlation, and regression analysis. Adopting a positivist research philosophy and deductive approach, the study aims to gather empirical evidence and test hypotheses. Ultimately, the goal is to enhance understanding of TMS dynamics and their impact on project success in Sri Lanka's construction industry.

Findings reveal a high internal consistency in measuring both "Project Success" and various components of "TMS" within the Sri Lankan construction context. Correlation and regression analyses indicate significant positive correlations between project success and TMS components, signaling that a stronger TMS correlates with higher project success in Sri Lankan construction endeavors and TMS aspects collectively explaining a substantial portion of project success variance. The study successfully identified best practices, challenges of TM, and strategies to overcome them.

Specifically, providing of resources, organizational structures, communication, expertise, and authority of all TMS aspects emerge as statistically significant predictors of project success. Each of these components demonstrates a positive relationship with project success, indicating that industry practices and operating procedures associated with TMS contribute significantly to project outcomes in Sri Lankan construction projects. Further, the identified effective TMS practices and strategies to overcome challenges offer valuable guidance for industry professionals, policymakers, and researchers seeking to improve project outcomes in Sri Lanka's construction sector. Overall, findings of the study contribute to scholarly discourse on project management and provide practical insights for industry practitioners.

KEYWORDS: TMS, Construction Industry, Project Success, limitations, challenges, Sri Lanka

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List of Abbreviations

TMS	– Top Management Support
TM	– Top Management
PM	– Project Manager
SM	– Senior Manager
TMs	– Top managers
PMI	– Project Management Institute
PMBOK	– Project Management Body of Knowledge
IESL	– Institution of Engineers Sri Lanka
PhD	– Doctor of Philosophy
PMP	– Project Management Professional
CIDA	– Construction Industry Development Authority
PMO	– Project management office
OLS	– Ordinary Lease Squares
RBV	– Resource Based View
GDP	– Gross Domestic Product

1 INTRODUCTION

The successful execution of projects relies significantly on the support provided by top management (TM) in any organization. Top management support (TMS) influences project performance by facilitating effective resource allocation, informed decision-making, proactive risk management, strong stakeholder engagement, and fostering leadership and motivation within project teams. The construction sector, characterized by its complex project dynamics and the crucial requirement for effective management techniques, is fertile ground for investigating the impact of TMS on project performance. The introduction section of the present report provides the scope of the current project, with a particular emphasis on highlighting the importance of TMS and its impact on the overall success of projects. In the field of project management within the construction industry, especially in the context of Sri Lanka, this chapter takes on even more relevance owing to the sector's key position in the nation's economic growth and infrastructural expansion.

This chapter begins by clearly defining the research challenge, with the aim of addressing gaps in the current knowledge. This assumption operates on the belief that gaining a deep knowledge of the complexities involved in TM's role might reveal solutions to improve project results. The establishment of research goals and inquiries enhances the study's concentration, guaranteeing a focused investigation of the recognized concerns. The factors together emphasize the research's aim to provide valuable insights into the practices and difficulties of TM in the construction industry of Sri Lanka. Furthermore, the study's importance is expounded upon, demonstrating not just its scholarly value but also its practical ramifications for professionals in the sector and legislators. This dual approach guarantees that the study results have the ability to influence both theory and practice, delivering concrete suggestions that may lead to actual improvements in project outcomes.

First, the chapter organization is introduced, providing readers with an outline of the study's framework. This overview aids in navigating the rest of the chapters, each focusing on a distinct aspect of the research process. In the following chapters, I include a thorough literature review, a detailed explanation of the methodology, the presentation and analysis of data, the discussion, and finally, the conclusion, and recommendations. Employing this methodical technique not only improves the legibility of the research but also emphasizes the methodical and rigorous quality of the academic investigation.

1.1 Background

The construction sector is crucial for the economic progress of nations, making a substantial contribution to both the national GDP and employment rates. However, the industry often

experiences project delays, cost overruns, and an inability to satisfy project requirements, which may be attributed to several issues, including insufficient TMS (Chan, Scott, & Lam, 2002). The involvement of TM in providing resources, fostering efficient communication, and determining strategic orientations is vital for project success (Muller & Turner, 2007).

Recent research has highlighted the significance of strong backing from top-level executives in project management, emphasizing its influence on the achievement of projects (Zwikael & Smyrk, 2015). TMS is demonstrated through the allocation of resources, organizational structures, facilitation of effective communication, utilization of knowledge, and appropriate exercise of power and authority (Belout & Gauvreau, 2004; Shenhar, Dvir, Levy & Maltz, 2001). These factors are essential for effectively managing the intricacies of construction projects, which are distinguished by distinct difficulties such as strict timelines, financial limitations, and the need for collaboration among many parties involved (El-Sabek & McCabe, 2017). Successfully completing projects poses a significant challenge, primarily attributable to a deficiency in leadership capabilities coupled with insufficient support from TM (Ahmed & Philbin, 2022). Upper management support is an essential feature of organizational effectiveness, embodying the leadership qualities and strategic decision-making abilities of senior executives.

A substantial body of literature is dedicated to TMS and its role in developing frameworks and conceptual models. Amidst the vast array of such literature aimed at improving the success rate of project completions worldwide, this consensus has emerged from the frequent failure of projects to meet their initial goals, thereby impacting organizational objectives (Ahmed, Mohamad, & Ahmad, 2014). The existing literature outlines various critical success aspects that affect the end the projects triumphantly. Among them, TMS emerges as a significant aspect across various industries and countries (Ziemba & Oblak, 2013). In developing nations, where the construction industry is a crucial contributor to economic development but, frequently lacks the sophistication and infrastructure seen in more advanced markets, there is a pressing need for strong TMS (Perera, Rameezdeen, Chileshe, & Hosseini, 2014).

Therefore, there persists an ongoing necessity to comprehend the influence of TMS in multidimensional contexts on the success of projects in accordance with different cultures and industries. This particular aspect has not been explored in prior studies, as noted by Ahmed et al. (2014) and Ahmed and Mohamad (2016). This study aims to address this gap by investigating the bond between TMS and project success, current industry practices, and challenges of TM professionals in supporting project teams. Given the proliferation of infrastructure development projects in Sri Lanka, establishing effective relationships between company TMs, project leaders, and teams is an important consideration. Therefore,

understanding the connection of TMS and project success, as well as current practices in the construction industry of Sri Lanka, is vital.

1.1.1 Background of the Sri Lankan Building Sector

The building sector is crucial for the economic progress of nations, making a substantial contribution to both the national GDP and employment rates (see Figure 1.1). The industry often has project delays, cost overruns, and inability to satisfy project requirements, which may be ascribed to several issues, including insufficient TMS (Chan et al., 2002). TM's involvement in providing resources, fostering efficient communication, and determining strategic orientations is vital for project success (Muller & Turner, 2007).

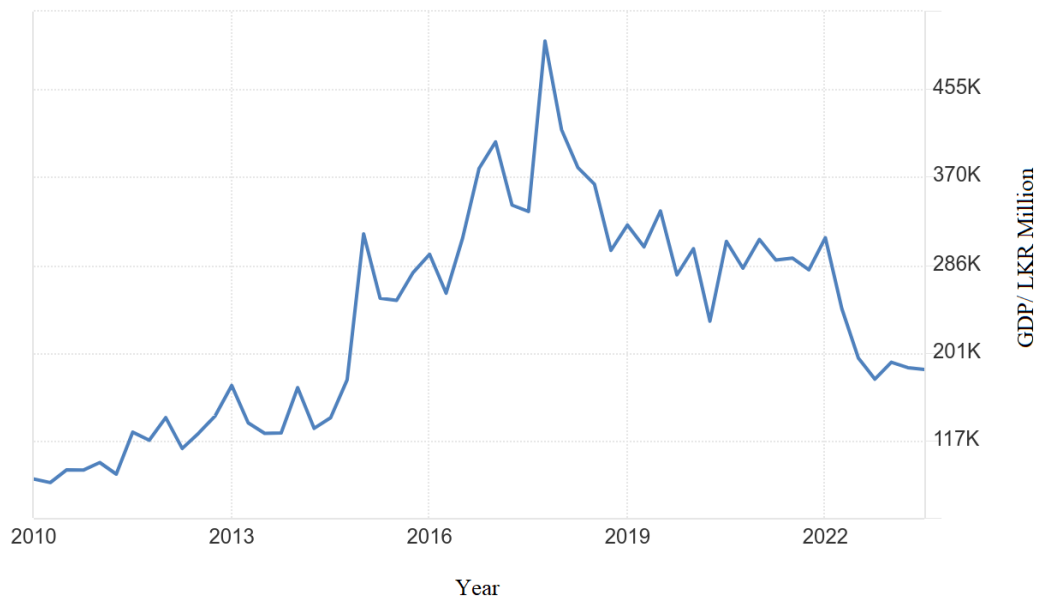


Figure 1.1: Construction sector's contribution to the GDP (2010-2023)

Source: Department of Census and Statistics (DCS) (2023)

Recent research has highlighted the significance of strong backing from top-level executives in project management, emphasizing its influence on the achievement of projects (Zwikael & Smyrk, 2015). TM is shown by allocating resources, organizing structures, facilitating effective communication, using knowledge, and exerting appropriate power and authority (Belout & Gauvreau, 2004; Shenhar et al., 2001). These factors are essential for effectively managing the intricacies of building projects, which are distinguished by their distinct difficulties such as strict timelines, financial limitations, and the need for collaboration among many parties involved (El-Sabek & McCabe, 2017).

In developing nations, where the construction industry is a crucial contributor to economic development but frequently lacks the sophistication and infrastructure seen in more advanced markets, there is a pressing need for strong TMS (Perera et al., 2014). The objective of this research is to examine the bond between the level of support from TM and the success of projects in the building sector in Sri Lanka. This study aims to enhance the existing knowledge on project management and provide practical insights for practitioners and policymakers by examining current methods, constraints, and ways for resolving obstacles.

1.2 Research Problem

The construction sector in Sri Lanka, as in many developing nations, encounters several obstacles that hinder its efficiency and effectiveness. Growth and development in the construction sector are often impeded by various challenges, including project delays, cost overruns, quality concerns, and labor shortages, despite its substantial contribution to the national economy (Perera, Rameezdeen, Chileshe & Hosseini, 2018). The lack or insufficiency of such assistance has been associated with project failures, emphasizing the crucial involvement of senior management in guaranteeing project success (Silva, Alwi & Hampson, 2020). In addition, the construction projects in Sri Lanka are characterized by a dynamic and complex nature, involving various stakeholders and unpredictable environmental factors. This makes the research problem more challenging and requires a more thorough investigation into the impact of TMS on project success (Jayasundara, Rathnayake & Gunawardane, 2017).

Most research tends to be predominantly conducted in Western contexts (Fareed & Su, 2022). Despite extensive research in other contexts, the exploration of TMS in construction projects remains largely unexplored in the Sri Lankan construction industry. This study intends to address this gap by exploring the connection between TMS and project success, current industry practices, challenges faced by TM professionals in supporting project teams and strategies to address the challenges and limitations.

The research problem is exacerbated by the scarcity of published empirical information about the precise processes by which TMS impacts project performance in the Sri Lankan construction sector. Although the significance of TMS is extensively recognized in the research, there exists a lack of comprehension about the implementation and perception of these practices in Sri Lanka, as well as their alignment or deviation from worldwide best practices (Kumaraswamy, 2016). This deficiency not only obstructs the development of efficient methods to boost TMS but also restricts the capacity of project managers (PMs) and teams to use TM assistance for enhanced project results (Rajapakse, 2019).

1.3 Problem statement

Within the dynamic and intricate context of the construction sector in Sri Lanka, the effectiveness of TMS has become a crucial aspect in achieving the success of projects. Although the significance of TMS in enhancing project results is acknowledged, empirical data indicates a widespread lack of alignment between the assistance offered by TMS and the practical requirements of project teams and managers (Belout & Gauvreau, 2004; Serrador, Gemino, & Reich, 2018). This misalignment has been linked to the inadequate execution of construction projects, resulting in delays, exceeding costs, and compromised quality standards (Jaselskis & Ashley, 1991; Nguyen & Hadikusumo, 2017).

The issue is exacerbated by the absence of a cohesive framework in the building sector of Sri Lanka to systematically tackle the constraints and difficulties of TMS, consequently impeding the industry's ability to accomplish project goals efficiently and effectively. This study aims to fill this need by examining the existing methodologies of TMS in the construction sector in Sri Lanka, identifying the inherent obstacles and constraints, and outlining viable approaches to enhance project performance through improved management assistance.

1.4 Research Questions

The research questions serve as the fundamental basis for the investigation, aiming to uncover the intricacies and dynamics of TMS and its impact on project success. The research inquiries, aligned with the aims, are as follows:

1. How does TMS in construction projects in Sri Lanka correlate with project success? This question aims to explore the relationship between successful project completion and the current TMS practices within organizations involved in construction projects.
2. What are the most effective industry practices of TMS in construction projects in Sri Lanka? This question aims to uncover a comprehensive overview of the strategies and operational frameworks that define the landscape of TMS within the industry, providing insights into the spectrum of practices employed by TM.
3. What limitations and challenges do TM encounter when supporting PMs and teams in the construction industry in Sri Lanka? This question examines the specific constraints and hurdles faced by TM in their efforts to support project staff, offering insights into areas where improvements are necessary to enhance project outcomes.
4. What TM practices address the limitations and challenges to promote project success? This question explores the adaptive strategies and remedial actions undertaken by TM to

overcome challenges, aiming to reveal effective practices the achievement of construction projects despite limitations encountered.

1.5 Objectives

The primary objective of this study is to thoroughly examine and comprehend the multifaceted role of TMS in Sri Lanka's construction projects. This investigation aims to achieve a comprehensive understanding of how TMS influences project success, thereby enriching the existing body of knowledge and offering practical insights for industry practitioners. To accomplish this goal, the research objectives are outlined as follows:

1. To explore the link between successful project completion and TMS in construction projects in Sri Lanka.
2. To determine the most effective contemporary TMS practices in Sri Lankan construction projects to ensure project success.
3. To uncover the limitations and challenges encountered by TM professionals in supporting PMs and teams within the Sri Lankan construction sector.
4. To identify the suitable practices to employ by TM to overcome the limitations and challenges in favor of project success.

1.6 Significance of the Study

This research holds significance in several aspects, rendering it relevant and valuable across academic, practical, and policy domains within the building business in Sri Lanka. By addressing the relationship between TMS and successful project achievement, this study provides valuable insights that contribute to the current knowledge base, offering a thorough understanding of this dynamic that benefits researchers, practitioners, and policymakers alike. The significance of this study extends across academic, practical, and policy domains within the context of the Sri Lankan construction industry, filling a critical gap in the existing body of knowledge and offering a comprehensive understanding that benefits scholars, practitioners, and policymakers.

Furthermore, this study enhances the theoretical foundation of project management by clarifying the function of TMS in the construction industry. It contributes to the current body of knowledge by presenting empirical data from Sri Lanka, enhancing the worldwide discussion on project management methods. From a practical standpoint, the results of this research provide actionable insights for construction industry experts in Sri Lanka and abroad.

The research equips PMs and senior executives with the information to create a supportive atmosphere that promotes project success by identifying effective techniques for boosting TMS. On the policy front, this study has the potential to influence the formulation of industry standards and recommendations that encourage best practices in TMS. By stressing the crucial role of TMS in attaining project success, the research advocates for governmental interventions that assist in the formation of strong management frameworks within the construction industry.

1.7 Research Methodology

The study methodology proceeded through several sequential steps. Initially, an extensive literature review was conducted to ascertain various measures of project success, dimensions of TMS, and the models employed in past research endeavors. Subsequently, a literature-based questionnaire was carefully crafted to align with the specific context of Sri Lanka. This questionnaire underwent the implementation of a pilot survey to ensure its efficacy and relevance. Following this preliminary phase, data collection commenced, engaging respondents to gather relevant information. Finally, the collected data has been analyzed to derive meaningful insights and conclusions.

1.8 Guide to the Thesis

The remainder of the report flows as follows. The introduction section sets the stage by providing background information, articulating the research problem, delineating the objectives, and offering a brief summary of the methodology employed. Moving on to the literature review, previous research findings are examined in detail. The research methodology section enquires into the specifics of methodologies utilized in prior studies while elucidating the chosen approach for this research, which includes the development of a questionnaire and the selection of the study sample. Subsequently, the analysis and discussion segment comprehensively examine the research findings, encompassing aspects of data collection, analysis techniques employed, data processing methodologies, and the validation of results. Finally, the conclusion section discusses practical applications derived from the findings, acknowledges the limitations of the research, provides recommendations for potential research areas to carry out in future, and outlines the broader implications of the study for the field of construction management.

2 LITERATURE REVIEW

Chapter 2 undertakes an extensive examination of the literature regarding the characteristics that contribute for the success of projects, particularly within the construction sector. This chapter establishes the theoretical foundation by analyzing fundamental ideas that influence project management techniques and explores empirical research that provides insights into the main variables for achieving success. By conducting a thorough examination, the goal is to identify the crucial functions fulfilled by resource allocations, organizational structures, efficient communication, the proficiency of the TM, and the authority provisions. This chapter aims to integrate theoretical ideas with empirical data to provide a detailed consideration of the dynamics that contribute for the successful project. Consequently, it offers a robust framework for analyzing the research objectives. This analysis lays the groundwork for a more thorough examination of how these components collaborate to facilitate the effective execution of construction projects, offering valuable insights for both scholarly research and practical implementation in the industry.

2.1 Theoretical Review

The theoretical review in this research plays a pivotal role in establishing foundational ideas and theories to comprehensively study the effect of TMS on the success of building projects. It not only situates the work within the broader academic context but also outlines theoretical perspectives tailored to address the complexities inherent in building project management. To achieve this, the review integrates the existing theories and models/frameworks of project success and TMS including the concepts from four influential theories: Contingency Theory, Stakeholder Theory, Agency Theory, and Resource-Based View (RBV).

Each of these theories and frameworks offers a unique lens through which to understand the factors contributing to project success. RBV emphasizes the strategic allocation of resources, Stakeholder Theory highlights the importance of considering diverse stakeholder interests, Agency Theory delves into the alignment of goals and incentives, and Contingency Theory highlights the need for adaptive management practices in response to varying circumstances.

By producing these theories and frameworks, the review provides a strong framework for analyzing the impact of TMS strategic choices on project outcomes. It emphasizes the significance of internal capabilities, stakeholder involvement, effective governance structures, and situational flexibility in ensuring project success.

Importantly, this theoretical foundation not only guides the practical examination and interpretation of results but also contributes theoretically rigorous and practically applicable

insights to project management best practices in the construction industry. It bridges the gap between academic theory and real-world application, offering valuable guidance for PMs and stakeholders alike.

2.1.1 Success of the projects

In examining project success within the construction industry, understanding the complex interplay between project scenarios, success metrics, and TMS emerges as a crucial research area. Drawing insights from a comprehensive review of past literature, existing studies thoroughly examine the facets of project success, the role of PM, and the pivotal importance of TMS.

Project, as defined by PMBOK (2015), is a temporary endeavor aimed at delivering unique outcomes. Projects necessitate effective leadership and oversight to achieve their objectives. The concept of a 'project' can be defined as an intricate arrangement of economic activities where limited resources are allocated with the anticipation of obtaining benefits that surpass the costs of the utilized resources. The effective achievement of construction projects is realized once the project's objectives have been accomplished. Usually, PMs are assigned by firms to lead and guide the project team, with the fruitful accomplishment of the project and the achievement of the relevant objectives being their main responsibility. Additionally, PMs are often appointed by the higher-level management of a firm or a sponsor of the relevant project. PMs are well-planned, motivated, passionate, and concerned with achieving challenges and targets (PMBOK, 2015).

Every industry presents different types of projects, shaped by distinct decision-making and governance structures. Consistent delivery of projects is achievable through PMs who possess effective leadership competencies, complemented by robust backing from TM (Urton & Murray, 2021). While larger enterprises have systematically examined factors leading to success or failure, several small and medium-sized enterprises (SMEs) in construction have not, hence studies on success factors in small construction businesses encounter specific challenges or barriers distinct from those encountered by larger organizations (Sarvari, Chan, Alaeos, Olawumi, & Abdalridah, 2021). Zwikael (2008) identified four project success factors, drawing data from PMs across various sectors and countries.

Project success is measured in diverse aspects, including health and safety, environmental performance, time, cost, quality, customer satisfaction, team impact, and organizational and business success (Luo, He, Xie, Yang, & Wu, 2017; Carvelho & Rabechini, 2017; Shenhar & Dvir, 2007; Kerzner, 2006; PMBOK, 2015). Furthermore, Shenhar and Dvir (2007) highlight the complexity of project success and suggest that the concept of Project Performance goes

beyond the binary outcomes of success or failure. The difference aspects of project success are summarized in the Table 2.1.

Table 2.1: A summary of few project success measures stated in the literature

Names of researchers/ Authors	Aspects and measures of the project success
Zwikael (2008)	<ul style="list-style-type: none"> • Exceeding time expectations • Overcoming cost limitations • Assessing overall project performance • Ensuring customer satisfaction
Luo et al. (2017)	<ul style="list-style-type: none"> • Prioritizing health and safety • Evaluating environmental impact • Managing time, cost, and quality • Ensuring participant satisfaction • Measuring user satisfaction and commercial value
Carvalho and Rabechini (2017)	<ul style="list-style-type: none"> • Enhancing project productivity • Assessing impact on customers and staff • Measuring direct business achievements • Mitigating environmental effects • Planning for future success
Shenhar and Dvir (2007)	<ul style="list-style-type: none"> • Evaluating impact on customers • Assessing impact on the project team • Measuring direct organizational and business success • Ensuring project efficiency • Planning for the future
Kerzner (2006)	<ul style="list-style-type: none"> • Ensuring customer satisfaction • Assessing manufacturability and execution efficiency • Fostering personal growth • Monitoring technological performance • Evaluating overall business performance
PMBOK (2015)	<ul style="list-style-type: none"> • Managing scope, time, and cost • Ensuring quality • Managing resources • Identifying and mitigating risks

Their overarching model of project achievement emphasizes the multidimensional nature of project accomplishment, with efficiency of the project serving as a foundational element. By incorporating these dimensions, the model provides a more comprehensive understanding of project success beyond mere efficiency metrics (Ahmed & Mohamad, 2016; Ahmed et al., 2014). The model of project success used in many earlier research studies includes the five project success aspects framework of Shenhar and Dvir (2007), as mentioned in Figure 2.1 (Ahmed & Mohamad, 2016; Ahmed et al., 2014).

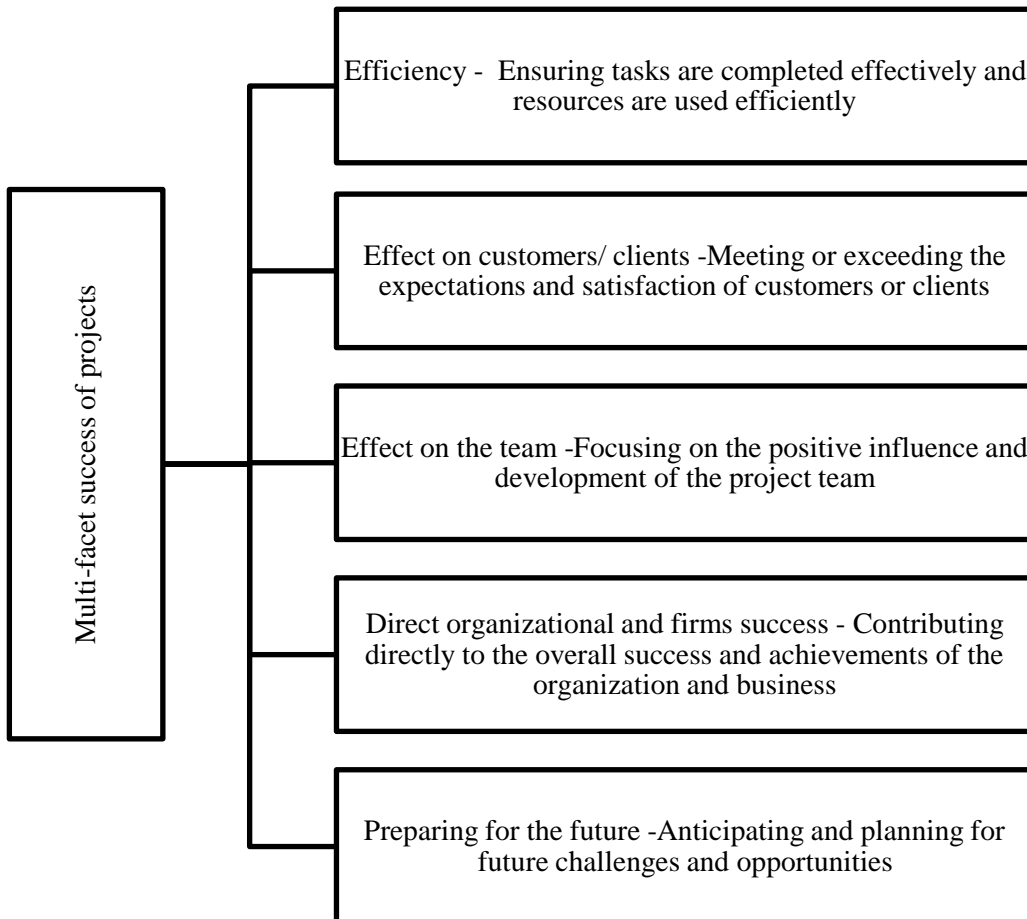


Figure 2.1: Multi-facet project success measures by Shenhar and Dvir (2007)

According to Shenhar and Dvir (2007)'s model of successful project accomplishment aspects, the first aspect, known as Project efficiency, involves a comprehensive assessment of various factors such as plan performance, adherence to timelines, budget management, quality of deliverables, and the efficient utilization of resources. This aspect serves as a short-term evaluation, focusing on the immediate aspects of a project's success (Ahmed & Mohamad, 2016; Ahmed et al., 2014). Project efficiency entails a meticulous analysis of how well the project adheres to its initial plan, stays within the allocated budget, meets quality standards, and optimally utilizes available resources.

In the context of Shenhar and Dvir (2007)'s project success model, the second aspect is defined as "Impact on clients." This aspect focuses on evaluating the satisfaction of the employer or user upon the completion of the project. Understanding the client's contentment is deemed crucial, especially in construction projects, where clients play a pivotal role as key stakeholders (Ahmed & Mohamad, 2016; Ahmed et al., 2014). Assessing the impact on clients involves a comprehensive examination of various factors, including client satisfaction levels, the fulfillment of project scope, and the degree to which the completed work fulfills the client's prospects. As emphasized by Khan, Long, and Iqbal, 2014, this measure acknowledges the significance of considering not only satisfaction but also factors such as current usage levels and the overall fulfillment of the project's scope of work. It recognizes the dynamic nature of client relationships and underscores the importance of delivering outcomes that resonate positively with the client, thereby contributing to the overall success of the project (Ahmed & Mohamad, 2016; Ahmed et al., 2014).

In the framework of Shenhar and Dvir (2007)'s model for project success, the third aspect is denoted as Impact on the team. This aspect is intended to explore the progress and enhancement of the project team, encompassing aspects such as professional development, management skills, and competencies. Notably, it is viewed as an indirect investment aimed at improving human resources within the organization, as highlighted by Ahmed and Mohamad (2016) and Ahmed et al. (2014). This measure extends beyond the immediate project outcomes and takes into account the long-term benefits associated with the team's growth and development. It involves evaluating the effectiveness of training programs, the acquisition of new skills, and the overall improvement in the capabilities of the project team members. By doing so, organizations can make strategic investments in human capital, fostering a more skilled and adaptable workforce (Kemei, Oboko, & Kidombo, 2018; Ahmed et al., 2014). Furthermore, the aspect delves into the intangible aspects of team dynamics, examining the morale and loyalty of the project team toward the company during their engagement in the project (Kemei et al., 2018). This consideration acknowledges the significance of team cohesion and positive morale as contributing factors to project success. A team that is not only professionally competent but also motivated and loyal can enhance collaboration and productivity, ultimately influencing the overall success of the project (Ahmed et al., 2014; Kemei et al., 2018).

In Shenhar and Dvir (2007)'s project success model, the fourth aspect is Direct organizational and Business success. This aspect focuses on assessing the immediate and tangible impacts on the financial health of the firm. Key indicators examined include revenue, earnings, cash flow, return on investment, and other financial aspects contributing to the overall financial feasibility

of the organization. This measure reflects the direct and quantifiable effects of the project on the organization's financial performance. As highlighted by Ahmed and Mohamad (2016) and Ahmed et al. (2014), this measure provides a crucial evaluation of the economic viability and success of the project from a business perspective. By analyzing metrics such as revenue generation, profitability, cash flow stability, and return on investment, organizations can gauge the project's direct contribution to the financial well-being of the firm. The inclusion of financial indicators in the fourth aspect underscores the practical and bottom-line-oriented nature of project success (Shenhar & Dvir, 2007). Beyond the intrinsic value of delivering projects successfully, this measure emphasizes the importance of projects in generating tangible economic benefits for the organization. It serves as a critical link between project management efforts and the broader goals of sustaining and enhancing the financial health of the business (Ahmed et al., 2014).

In Shenhar and Dvir (2007)'s project success model, the fifth aspect is defined as Preparing for the future. This aspect emphasizes the project's strategic perspective, aiming to confirm that the project serves not only as a current investment but also as an opportunity for the future development and growth of the company. As noted by Ahmed et al. (2014), successful projects play a vital role in positioning the company for lasting success and expansion within the industry (Ahmed et al., 2014; Kemei et al., 2018; Ahmed & Philbin, 2022). This aspect goes beyond the immediate outcomes and financial impacts, acknowledging that projects should be viewed as strategic investments that contribute to the organization's future sustainability and competitiveness. Projects that are well-executed and aligned with the long-term goals of the company can serve as catalysts for expansion, innovation, and market positioning (Ahmed et al., 2014; Ahmed & Philbin, 2022).

This involves anticipating industry trends, technological advancements, and evolving customer needs. Strategic foresight ensures that the organization not only addresses current challenges but also positions itself to seize future opportunities, fostering a proactive and forward-thinking approach to project success (Ahmed & Philbin, 2022).

2.1.2 Top Management Support (TMS)

In the literature, TM refers to individuals in senior management positions, such as Directors, Presidents, or Chief Executive Officers (Ahmed et al., 2014). Furthermore, various terms used interchangeably with TM include senior management, higher management, executive management, and upper management (Basu, 2014). TMS plays a pivotal role in securing the necessary resources for projects, ensuring that projects receive adequate funding, skilled personnel, and other essential resources required for successful execution (Fareed & Su, 2022).

According to Young and Poon (2013), projects backed by TM are considered unlikely to fail, indicating a strong association between senior-level executive support and project accomplishment. When TM actively involve and support projects, it contributes to a more favorable environment for project outcomes. Proficient TM support instills self-confidence and motivates project leaders to channel their leadership efforts toward achieving successful projects. The measurement of TMS involves assessing how well TM understand the importance of project success and actively engage in implementing the project (Ahmed & Philbin, 2022).

In their research study, Young and Jordan (2008) categorized critical success factors of a project, identifying TMS as a primary factor. These factors are outlined in Figure 2.2, highlighting the significant role of TMS in project success.

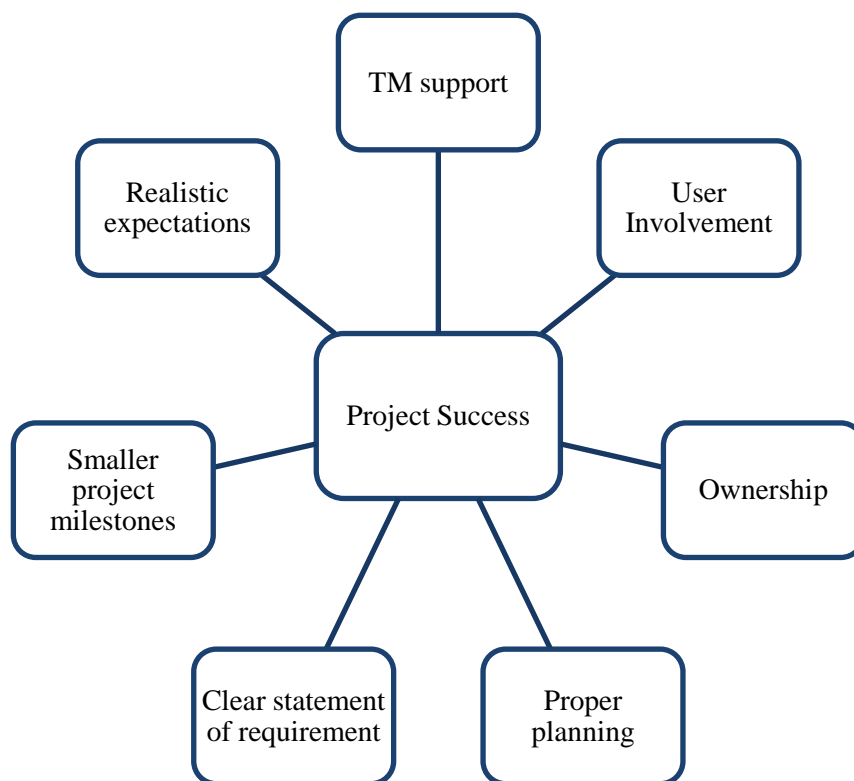


Figure 2.2: Factors of project success by Young & Jordan (2008)

In this context, TMS plays a dynamic role in ensuring successful construction projects, necessitating essential skills in leadership, guidance, control, supervision, and management, particularly for senior-level individuals or PMs (Bryde, 2008). Research studies consistently affirm the pivotal role of TMS as a serious success factor for project accomplishment (Ahmed et al., 2014; Young & Jordan, 2008). Moreover, TMS absence often leads to project

termination due to its vital link between organizational functions and project teams (Li, Chen, Lee, & Rao, 2013; Zwikael, 2008).

Despite the multifaceted nature of TMS, it is commonly measured by the availability and allocation of funds, physical resources, and the entrustment of authority to project leaders and project crews by higher management (Khan et al., 2014). TMS can manifest in various forms, including providing assistance in crisis or challenging situations, inspiring and developing individuals, and demonstrating commitment to project objectives (Kandelousi, Ooi, & Abdollahi, 2011). Recognized as a significant critical success factor, TMS is extensively researched across different industries due to its positive correlation with project success (Ahmed & Mohamad, 2016; Young & Poon, 2013). Furthermore, the lack of senior management support is noted as hindering successful project completion (Young & Poon, 2013). Empirical evidence strongly supports the impact of TMS on the success of the project, highlighting the need for precise identification and application of TMS aspects to aid project teams in achieving their goals (Barczak, Griffin & Kahn, 2009; Boonstra, 2013).

It is crucial to supply the essential financial, human, material, and other physical resources to a project team in all industries for the successful completion of a project. Therefore, the provision of necessary resources is regarded as a component of TMS (Ahmed & Mohamad, 2016; Ahmed et al., 2014; Ahmed & Philbin, 2022). Additionally, the literature recognizes the influence, contribution, and input of senior-level management as integral to TMS (Tan & Noor, 2013). On the flip side, a deficiency of backing from TM is recognized as a substantial reason contributing to project failure (Belassi & Tukel, 1996). However, there are instances where TM is not readily available to assist project teams. In many cases, their support is provided only nominally, lacking substantial assistance to the project teams.

While there is extensive research on single-dimensional TMS, studies on multi-dimensional TMS are limited (Ahmed & Mohamad, 2016). Several research studies on the success of the projects and single-dimensional TMS have been carried out, and the findings are available in engineering management literature. Further, literature on the multi-dimensional TMS was assessed very rarely (Ahmed & Mohamad, 2016; Boonstra, 2013; Ahmed & Philbin, 2022). Lee, Shiue, and Chen, 2016 stated successful implementation and adoption of Information Technology (IT) and Information Systems (IS) are commonly seen as contingent on TMS.

Furthermore, Zwikael (2008) has recommended the best practices to follow for TMS in different industries, best practices related to Engineering, Construction, and Government are summarized in Table 2.2.

Table 2.2: Best practices to follow for TMS by Zwikael (2008)

TMS processes	Engineering	Construction	Government
Periodic review and updating of project procedures to ensure they remain relevant and aligned with evolving project requirements.	x		
PM's active participation and contribution during the initiation phase to lay a solid foundation for project success.		x	
Establishing clear metrics and criteria for measuring project success, helping to evaluate project performance against predefined benchmarks.	x		
Dedicated project office/PMO to oversee and support project-related activities.	x		
Continuous training programs to keep project management teams updated on the latest methodologies and best practices.	x		
Adoption and utilization of standardized project management software tools to enhance efficiency and consistency in managing projects.	x		
Exploration and adoption of innovative tools and techniques to enhance project management practices.	x		
Organizational structure that provides adequate support for project teams, facilitating collaboration and success.	x		x
Collaborative and interactive groups involving different departments to enhance coordination and synergy in project activities.	x		
Use of organizational projects data warehouse.	x		

TMS encompasses various aspects, including the allocation of resources, establishment of facilitation of effective communication, ability to share knowledge, organizational provisions, and understanding the dynamics of influence within the project context (Boonstra, 2013; Khan et al., 2014; Tan & Noor, 2013; Pinto & Slevin, 1988; Barczak et al., 2009; Kandelousi et al., 2011). Thus, scholars have explored the content of TMS, emphasizing its multidimensional nature concerning resources, knowledge, time, power, organizational modification, and communication (Ahmed et al., 2014; Ahmed & Mohamad, 2016; Chen & Paulraj, 2004).

Researchers have explored into the intricacies of TMS, highlighting its multidimensional nature, covering aspects such as proficiency, authority, time, resources, operational modification, and communication (Boonstra, 2013; Ahmed & Mohamed, 2016; Sicotte & Delerue, 2021). Moreover, TM assumes a pivotal role in project preparation and execution, contributing significantly to ensuring the fruitful accomplishment of projects. This multifaceted involvement highlights the dynamic and comprehensive impact of senior management within the project management sphere. A summary of a few TMS aspects, measures and models developed and identified by various authors and researchers is summarized in Table 2.3.

Table 2.3: A summary of few measures of TMS found in the literature

Researchers/ authors	Aspects and measures of TMS
Boonstra (2013)	<ul style="list-style-type: none"> • Supplying resources • Establishing structural arrangements • Facilitating communication • Offering expertise • Exercising power
Khan et al., (2014)	<ul style="list-style-type: none"> • Ensuring the availability of financial resources • Assigning requisite human resources • Delegating authorities • Allocating necessary physical resources
Tan & Noor (2013)	<ul style="list-style-type: none"> • Providing support in terms of material, equipment, financial, and human resources to the team • Actively participating or involving themselves • Supporting organizational activities
Pinto and Slevin (1988) and Pinto and Slevin (2008)	<ul style="list-style-type: none"> • Addressing the expectations of the project leader regarding the amount, level, type, and nature of support for the project • Offering personal support for the project leader

Table 2.3: A summary of few measures of TMS found in the literature (continued)

Researchers/ authors	Aspects and measures of TMS
Barczak et al., (2009)	<ul style="list-style-type: none"> • Cultivating a balance of care and resource provision for the project team and leaders to guarantee the effective accomplishment of projects
Kandelousi et al., (2011)	<ul style="list-style-type: none"> • Backing the project team • Inspiring and motivating subordinates • Demonstrating commitment to the work

2.1.3 Resource Based View

The Resource-Based View (RBV), proposed by Wernerfelt (1984) and expanded by Barney (1991), stands as a cornerstone theory in strategic management and organizational studies. It argues that a firm's competitive advantage lies on its capacity to acquire, develop, and deploy valuable, rare, inimitable, and non-substitutable (VRIN) resources and skills, prioritizing internal characteristics over external factors.

The RBV asserts that strategic assets must possess high value, rarity, difficulty of replication, and lack of substitutability, encompassing both tangible and intangible resources, including TM competencies. In the construction sector, RBV offers a robust framework for grasping the significance of TMS in bolstering project success. Given the sector's reliance on projects, intricacy, and the imperative for collaboration, TMS demonstrated through strategic guidance, resource allocation, and the cultivation of a supportive organizational culture is viewed as a distinct asset enhancing the firm's capability to accomplish tasks efficiently.

Studies, such as those by Arto, Martinsuo, Gemunden and Murtoaro, 2008 and Muller and Turner (2007), highlight the pivotal role of TM in providing guidance and resources for project success within the RBV framework. In contrast, RBV underscores the strategic value of internal resources and skills.

2.1.4 Stakeholder Theory

Stakeholder Theory, originated by Freeman in the 1980s, is a crucial concept in organizational management and ethics. It advocates that organizations should effectively manage interactions with various stakeholder groups, beyond shareholders, for sustained success. Stakeholders, those who impact or are impacted by organizational goals, include workers, customers, suppliers, communities, and other relevant parties. Addressing their concerns is posited to lead to superior performance, sustainable development, and reduced risks.

Further, Stakeholder Theory emphasizes the need to understand stakeholders' expectations, resolve concerns, and engage them in decision-making processes. Also, Cleland (1995) highlights strategic stakeholder involvement for aligning project objectives with organizational goals. Olander and Landin (2005) found a strong link between stakeholder management techniques and project success, indicating that understanding and managing stakeholders' expectations are crucial for achieving project goals.

Yang, Shen, Ho, Drew, and Xue, 2009 showed that stakeholder satisfaction significantly impacts project performance, emphasizing the prioritization of stakeholder interests in project management. Jones and Wicks (1999) proposed a modified version focusing on the moral and ethical responsibilities of organizations toward stakeholders, emphasizing fairness and openness in managing stakeholder interactions. In studying TMS in construction projects, Stakeholder Theory illuminates how actively involving and supporting stakeholders enhances project success. Senior management's crucial role in promoting stakeholder involvement aligns the project with stakeholders' interests, fostering trust and collaboration.

The theory offers a thorough method for managing organizations and projects by highlighting the importance of stakeholder involvement, especially in stakeholder-rich sectors like construction. Implementing stakeholder-oriented strategies allows TM to enhance project performance, showcasing the practical impact of Stakeholder Theory in achieving sustainable organizational success.

2.1.5 Agency Theory

Agency Theory, fixed in organizational economics and formulated by Jensen and Meckling (1976) explores into the complexities of interactions between principals (owners) and agents (managers). It suggests that when conflicting interests and unequal information access exist, individuals may not consistently act in the best interests of those they represent, a significant concern in project management and construction projects.

The theory focuses on the contractual relationship between stakeholders, advocating for procedures aligning the interests of agents with those of principals. In project management, this involves using incentives, monitoring, and governance frameworks like performance-based contracts to ensure PMs pursue goals set by project sponsors or owners. Agency Theory also addresses risk-sharing between principals and agents, crucial in uncertain construction projects. The theory's emphasis on contractual remedies and monitoring may overly rely on control mechanisms, neglecting the importance of trust and relational standards, crucial in project teams where cooperation is vital. Agency Theory significantly influences project management procedures, particularly in construction. It shapes contracts, performance

assessments, and governance structures to manage complex connections among project owners, managers, and stakeholders. Further, Agency Theory highlights the need for explicit objectives, performance measurements, and incentive systems to motivate PMs, within the context of TMS for project success.

It also emphasizes efficient governance and oversight systems to supervise project progress and address conflicts of interest. While Agency Theory has limitations in its assumptions about agent behavior and its focus on contractual procedures, its ideas play a pivotal role in developing contracts, performance measurement systems, and governance structures in project management.

2.1.6 Contingency Theory

The Contingency Theory, originating in the 1960s, argues against a universally optimal approach to organizing a business or leading a firm. Instead, it asserts that the most active course of action hinge on the specific situations both inside and outside the organization. In project management, particularly in the construction sector with diverse project characteristics, Contingency Theory emphasizes the need for an adaptable management strategy.

Efficiency in Contingency Theory hinges on aligning management practices with situational circumstances, crucial in project management where leaders must adjust methods according to project needs, stakeholder expectations, and environmental conditions. The theory highlights the importance of situational analysis and adaptive management, urging PMs to evaluate project attributes and adapt strategies, including leadership styles and decision-making methods, accordingly. Additionally, Contingency Theory remains crucial in comprehending the intricate nature of project management, emphasizing the necessity for flexibility and adaptation. And, Contingency Theory highlights the importance of situational awareness and adaptable leadership, particularly concerning TMS for project success. Granting PMs, the latitude to adjust management techniques according to situational requirements is emphasized, improving project success by enabling customized resource allocation, decision-making, and support mechanisms tailored to each project's unique needs. The theory also underscores the significance of environmental scanning and stakeholder analysis in project management, emphasizing the alignment of project goals and management methods with situational demands.

In summary, Contingency Theory provides valuable insights into the significance of situational analysis and adaptive management in project management. It offers a framework for understanding the dynamic nature of project management, stressing the importance of flexibility and adaptability for achieving project success.

2.1.7 Theoretical Foundation of the Study

The study adopts a multidisciplinary theoretical approach, incorporating frameworks, models highlighted in the literature together with the Contingency Theory, Stakeholder Theory, Agency Theory, and Resource-Based View (RBV), and to investigate the impact of TMS on the success of building projects. This framework provides a detailed understanding of how internal capabilities, stakeholder involvement, governance structures, and situational factors collectively influence project outcomes in the construction sector.

Resource-Based View (RBV) underscores that an organization's competitive advantage relies on effective control and utilization of distinct resources and capabilities. In construction projects, RBV suggests that TMS enhances project success by strategically allocating organizational assets, such as financial resources and technical expertise, in a way that is challenging for competitors to replicate. Stakeholder Theory highlights the need for managing relationships with all entities impacted by the project. Success depends on TM's ability to understand and address diverse stakeholder interests through inclusive decision-making, transparent communication, and cooperation. Agency Theory focuses on the dynamic between TM and PMs, emphasizing explicit agreements and governance structures to align project goals with organizational objectives and minimize agency costs. Contingency Theory argues against a universal managerial approach, supporting for adaptability based on project-specific circumstances.

In addition, multi-dimensional frameworks developed by scholars supported the important TMS aspects of provision of resources, effective communication, organizational changes, proficiency in field and effective usage of power. The study aims to contribute insights to the understanding of how TMS impacts project outcomes in the construction sector, using this theoretical framework as a basis for exploration.

2.2 Empirical Review

The empirical study examines the crucial significance of TM assistance in improving project performance in the construction sector.

2.2.1 The Association Between TMS and Project Success

Establishing a resilient project policy and governance framework is paramount for senior leadership to provide effective support to project teams and ensure the triumphant completion of projects (Kemei et al., 2018). According to their insights TM support extends beyond mere endorsement; it involves strategic headship of the firm providing crucial care for projects associated with broader organizational aims. This active engagement includes participation in

steering committees and involvement in key project decisions. Moreover, Sicotte and Delerue (2021) highlighted the significance of TMS, advanced project arrangement, and stakeholder communication as pivotal accomplishment aspects. While these factors are deemed indispensable, their efficacy is not guaranteed. It underscores the dynamic nature of these elements in contributing to project success, emphasizing the need for continuous evaluation and adaptation in the project management landscape.

Critical to project success is the active engagement of TM, offering dynamic direction to the PM, as emphasized by Kerzner (2006). The contribution of TM is not a novel concept but rather a fundamental factor that continues to play an integral role in ensuring the success of projects. This enduring importance underscores the ongoing relevance of TM participation in steering projects toward favorable outcomes. The study conducted by Ahmed & Philbin (2022) operationalized multi-faceted support from TM as a mediator, adhering to the procedures set forth by Muller, Geraldi and Turner, 2012 and this approach enhances the facts and role of TM in moderating the various facets of support to optimize project success within the social sector. As a result, organizations operating within the public area can institute internal procedures to confirm the timely providing of essential resources by TM (Ahmed & Philbin, 2022). This strategic method can be seamlessly combined into the expansion of administrative approach and the yearly arrangement cycle for supply distributions (Muller et al., 2012). Furthermore, during the initiation and planning phases of projects, TM should incorporate structural mechanisms by embracing innovative ideas (Zwikael, 2008). This proactive measure aims to protect the upcoming aids of projects for the broader societal advantage (Ahmed & Mohamad, 2016, Ahmed et al., 2014, Ahmed & Philbin, 2022). In the realm of projects, TM takes an active role in supporting the deployment of human support requirements along with the adoption of procedures for end result development, as outlined by Sicotte and Delerue (2021).

The significance of TMS is underscored, and its absence is identified as a noteworthy concern in project contexts (Ahmed et al., 2014). Notably, senior management prioritizes organizational innovation concerns over technological issues when assessing project success (Sicotte & Delerue, 2021). This prioritization reflects the evolving landscape of project evaluation. In response to the inadequate study on accomplishment of projects in various aspects, Shenhar and Dvir (2007) pioneered a groundbreaking framework, utilizing a 4-point Likert scale. This innovative framework was next refined by Ahmed and Mohammad (2016), who operationalized it by employing a more detailed 5-point Likert rating scale. Ahmed and Mohamad (2016) studied the connection between the multiple dimensions of the TMS and the success of the projects since most of the former studies have focused on the TMS as a single-dimensional concept. The cooperation of senior management is essential in successfully

navigating the intricacies of construction projects. Danial (2020) highlights the crucial role of this support in shaping project results, indicating that the congruence between the vision and dedication of TM has a direct influence on project implementation and achievement. In a similar manner, Iqbal, Long, Fei, and Bukhari, 2015 investigate how TMS influences the connection between transformational leadership and project performance. Their findings suggest that leadership styles are more impactful when accompanied by robust support from TM. Ali, Khan, Shah, and Ullah, 2021 provided more details on the significance of humble leadership in achieving project success. They emphasize that TMS acts as a moderator, amplifying the effectiveness of team-building activities and ultimately resulting in improved project results. Fareed, Su, Naqvi, Batool and Aslam, 2023 confirm that the combination of transformative leadership and TMS is a strong indicator of project success. They highlight the collaborative impact of effective leadership and management support. The strategic phase of construction projects, endorsed by senior leadership, plays a pivotal role in the achievement of project success. Nguyen and Ogunlana (2004) conduct an empirical examination of significant building projects in Vietnam, highlighting the crucial role of TMS in achieving project success. Jitpaiboon, Smith and Gu (2019) provide evidence for the notion that management assistance is crucial for obtaining desired results in project performance, as they analyze the major success variables influencing it. Further, the research study of Ahmed and Mohamad (2016)'s has been presented evidence for the substantial positive connection among TMS and the project's accomplishment using the guide and model stated in Figure 2.1 and Boonstra (2013)'s framework included in Table 2.3.

Since, unhelpful TM is one of the main causes for unsuccessful or failed projects (Belassi & Tukel, 1996) and most of the research studies have been proved that there is a positive significant bond between the TMS of the company with the project success. Boonstra (2013) has identified few limitations such as the inadequate readiness of proper care due to limited resources, lack of time communicates effectively with relevant stakeholders, changing goals or contexts of projects and difference within the managerial level about the proper backing forms and procedures and the necessary levels and strength.

2.2.2 Study On the connection Between Knowledge Management and Project Performance

The implementation of knowledge management approaches within construction organizations profoundly influences the performance outcomes of project management. Gunasekera and Chong (2018) investigate into the essential components for success, asserting that effective procedures in knowledge management, supported by senior management, play a pivotal role in accomplishing project goals. This finding aligns with the conclusions drawn by Gunduz and

Almuajebh (2020), who emphasize the significance of sustainable construction project management approaches, including knowledge management, in achieving project success.

2.2.3 Strategic Planning and Organizational Structure

The strategic phase of construction projects, which is championed by senior leadership, serves as a cornerstone in the attainment of project success. Research by Khalil and Ali underscores the crucial role of project planning, particularly when facilitated by the collaboration of TM, in achieving the objectives of building projects. These findings shed light on the pivotal importance of the initial phases of project conceptualization and planning, during which the active involvement and support of senior management are indispensable (Zwikael, 2008). This underscores the concept that effective project outcomes are often predicated on robust strategic planning led by senior leadership, setting the trajectory for success from the project's inception. Thus, senior management's commitment and engagement during the strategic phase serve as a key player for project success, shaping the course of the project and laying a solid foundation for its execution and eventual outcomes (Zwikael, 2008).

2.2.4 Engaging Stakeholders and Identifying Success Factors

TMS plays a critical role in effectively engaging stakeholders, which is paramount for the success of construction projects. Garbharran, Govender, and Msani, 2012 research into the essential components influencing project success, with a particular focus on stakeholder management. Their research emphasizes the pivotal role of TM in cultivating a conducive environment for meaningful stakeholder engagement. By leveraging their leadership and decision-making process, senior management can foster trust, transparency, and collaboration among stakeholders, thereby enhancing the project's chances of success (Zwikael, 2008).

Furthermore, empirical evidence provided by Scott-Young and Samson (2008) from capital projects in the process industries reinforces the significance of effective project team management, which is facilitated by TM. Their findings highlight that strong project team management, bolstered by active involvement and support from senior management, emerges as a critical determinant of project success. Through proactive leadership and strategic direction-setting, TM can empower project teams to navigate complexities, resolve conflicts, and drive towards project objectives with cohesion and efficiency. Expanding on this, it becomes evident that TM's role extends beyond mere oversight; it encompasses fostering a culture of collaboration, innovation, and accountability within project teams. By providing guidance, resources, and support, senior management can enable project teams to effectively address stakeholder needs, navigate challenges, and capitalize on opportunities, thereby maximizing the likelihood of project success (Zwikael, 2008). Thus, the integration of TMS

practices into stakeholder engagement strategies becomes necessary for fostering mutually beneficial relationships and ultimately ensuring the successful delivery of construction projects.

2.3 Previous researches related TMS, critical success factors of project success and relationships and their recommendations

Nguyen and Ogunlana (2004) conducted an empirical examination of significant building projects in Vietnam, shedding light on the pivotal role of TMS in achieving project success. Their study highlights how effective management practices, particularly those facilitated by senior management, significantly contribute to successful project outcomes. Similarly, Jitpaiboon et al. (2019) present compelling evidence supporting the critical role of management assistance in attaining desired project performance. Through their analysis of major success variables influencing project outcomes, they emphasize the indispensable nature of management support in navigating project challenges and ensuring successful project delivery. These studies collectively highlight the importance of TMS and management assistance in driving project success, highlighting the need for strategic leadership and effective management practices throughout the project lifecycle (Zwikael, 2008).

Young and Poon (2013) conducted a study on the necessity and adequacy of TMS in Information Systems projects, focusing on a singular Information System project and delving into the complex dynamics of TMS and its impact on project accomplishment within the realm of organizational benefits. Employing a methodological approach grounded in fuzzy-set theory, the research harnessed the unique analytical power of this theory to examine the nuanced relationships within a limited, purposefully selected set of cases. Data collection involved insightful interviews, and the cases were meticulously developed by final-year business informatics students at the University of Canberra, ensuring a rich and diverse perspective. The utilization of fuzzy set analysis as the primary analytical tool allowed for a comprehensive exploration of the multifaceted aspects of TMS and its role in achieving successful projects, particularly in the domain of Information System projects.

Boonstra (2013) conducted a study on TMS and the reasons for the limited support from Senior Managers. Characterized by its descriptive and exploratory nature, the study aimed to uncover and categorize potential TM behaviors in the context of strategic information system projects. The study utilized interviews as the primary method of data collection, providing in-depth insights into the behaviors of Senior Managers. Extending its scope, the research conducted five case studies, each focusing on the implementation of strategic Information Systems in diverse organizational settings. The chosen methodology emphasized information richness and

the ability to identify any possible covariation in TM behaviors. The gathered data was analyzed through a cross-case analysis approach, contributing to the construction of a more comprehensive explanation of how TMs both support and, at times, withhold support for strategic information system projects.

Young and Jordan (2008) investigated the necessity of TMS in projects, employing interviews as the primary method for data gathering and case formulation. Participants in the study comprised stakeholders from various levels within the firm, including sponsors, project teams, and TMs, providing a holistic perspective on TMS within the research context. The analysis of the gathered data was carried out through a cross-case analysis, emphasizing the examination of multiple cases to construct a more comprehensive explanation of the role and impact of TMS. This approach facilitated a nuanced understanding of whether TMS is considered a mantra or a necessity in the effective execution of projects.

Ahmed et al. (2014) explored the effect of multidimensional TMS involving participants from the PMI community. Data collection utilized a structured questionnaire, providing a systematic approach to gather relevant information from the participants. The research methodology incorporated a multi-dimensional TMS concept drawn from Boonstra's (2013) model, ensuring a comprehensive understanding of TMS. The analysis of the collected data employed various statistical techniques, including descriptive and inferential statistics, to explore the multidimensional aspects of TMS and its impact on project success.

Ahmed and Mohamad (2016) investigated the link between TMS and the successful achievement of various projects, engaging participants from the PMI community across multiple countries. Data gathering was conducted through an online survey instrument, offering a convenient and efficient means to gather information from a diverse group of respondents. The research method involved adapting a multi-dimensional TMS concept founded on Boonstra's (2013) framework, allowing for a nuanced exploration of various aspects of TMS. The analysis of the collected data employed regression analyses, correlation analysis, and hierarchical regression analysis to thoroughly investigate and understand the intricate relationship between TMS and the success of projects on an international scale within the PMI community.

Ahmed and Philbin (2022) studied the relationships between different aspects of TMS and the accomplishment of public projects, specifically focusing on the context of Pakistan. The study involved participants including PMs and Project Directors in Pakistan. Data for the research were collected through a survey questionnaire, providing a structured approach to gather insights from individuals involved in social sector projects. The research methodology

involved the adaptation of a multi-dimensional TMS concept based on Boonstra's (2013) outline, allowing for a comprehensive examination of various aspects of TMS. The analysis of the collected data utilized regression analyses and correlation analysis.

There exists a research gap in comprehending the limitations and challenges faced by TM when supporting projects. Boonstra (2013) shed light on constraints such as limited resources, time constraints, changing project goals, and disagreements within the executive board. Therefore, researching into the practices of TMS in Sri Lanka, identifying the constraints faced by TM in supporting building projects, and identifying tactics to overcome these hurdles become pivotal steps to augment the effectiveness and efficiency of the building industry. Moreover, conducting an in-depth investigation into the bond between TMS and project success within the Sri Lankan construction sector is essential for further elevating project outcomes in the region.

Ahmed and Mohamad (2016) have recommended for future investigations might broaden the scope of their study by exploring multi-dimensional TMS as a plausible variable of mediator of moderator. Because of this could encompass on specific countries or diverse sectors, including services, education, infrastructure development, manufacturing, health, telecommunication, and information technology. Ahmed et al., 2014 has recommended to study diverse forms of TMS in different areas or fields and countries that contribute to a deeper understanding of the link between multi-dimensional TMS and successful completion of the project.

Additionally, investigating the connection of project success and multi-dimensional TMS within the Sri Lankan construction sector is essential for further enhancing project outcomes in the region. This comprehensive approach ensures a nuanced and thorough evaluation of project success across various critical aspects. As Ahmed and Mohamad (2016) suggested future research should explore TMS as a moderator or mediator variable across diverse sectors or specific countries.

Further, it is vital to study the multi-dimensional TMS with project success in the construction section considering the Sri Lankan context as recommended by the previous researchers as it a different country and different field. Also, there is a research gap in understanding the limitations and challenges faced by TM when supporting projects. Boonstra (2013) highlighted constraints such as limited resources, time constraints, changing project goals, and disagreements within the executive board. Thus, studying TMS practices in Sri Lanka, identifying TM limitations in supporting construction projects, and exploring ways to overcome them are crucial steps to enhance the construction industry's efficiency and

effectiveness. Therefore, it is imperative to study the multi-dimensional TMS concerning project success in the construction sector, considering the specific context of Sri Lanka.

2.4 Summary of Review on Variables

2.4.1 Review on the Dependent Variable: Project Success

The idea of project success is complex and has been thoroughly researched in different fields, especially in project management. The definition and evaluation of project success have undergone substantial changes, mirroring the intricate nature and wide range of project goals and stakeholder anticipations. Historically, project success was strictly delineated by the "iron triangle" parameters: time, money, and quality (Atkinson, 1999). Nevertheless, this viewpoint has faced opposition and has been extended to include wider aspects such as stakeholder contentment, durability, and the generation of lasting value (Baccarini, 1999; Shenhar et al., 2001). Within the current project management literature, the concept of project success is increasingly examined from a multi-aspect perspective. According to Shenhar et al. (2001), project success should be evaluated by considering both the immediate outputs of the project and its long-term effects on the organization and its stakeholders. This approach recognizes that a project that is considered successful based on its immediate outcomes (such as being finished on schedule and within the allocated funds) may not necessarily contribute to the organization's strategic goals or competitive edge.

The stakeholder theory enhances the comprehension of project success by highlighting the significance of meeting the varied requirements and expectations of all stakeholders engaged in or impacted by the project (Freeman, 1984). From this standpoint, the success of a project relies on its capacity to provide value to many stakeholders, such as customers, project teams, suppliers, and the broader community. This perspective is in line with the increasing focus on corporate social responsibility and sustainable development in project management methodologies. Furthermore, the significance of executive-level assistance has been recognized as a pivotal element impacting the success of a project. The scholarly literature on project success provides a comprehensive and dynamic comprehension of the elements that define a successful project. It emphasizes the transition from conventional, limited standards to a more comprehensive viewpoint that takes into account the lasting influence and value generation for a diverse set of individuals involved. The capacity to adjust and react to stakeholder requirements, conform to organizational policies, and use suitable project management approaches will be crucial factors in achieving project success as project environments grow more intricate and ever-changing.

2.4.2 Review on Independent Variables

The success of construction projects is heavily impacted by many aspects, with resource supplies, structural arrangements, communication, skill and expertise of the TM, and power being the most essential independent variables. Each of these elements is crucial in defining the overall efficacy and efficiency of project management methods, thereby influencing the result of the project.

2.4.2.1 Resource Provisions

Resource provisions include the distribution and accessibility of essential resources, such as monetary, tangible, and personnel resources, needed to effectively carry out a project. Ensuring that resources are provided in a sufficient and appropriate manner is essential for achieving project goals within the specified time frame and budget limitations. According to Nguyen and Ogunlana (2004), good resource management, including timely procurement and appropriate exploitation of resources, is a critical factor of project success. Furthermore, the research by Jaselskis and Ashley (1991) underlines the necessity of matching resource allocation with project requirements to boost project performance and success rates.

In accordance with Boonstra's framework, Dimension - 1 is labeled as "supply resources." This dimension aims to assess the adequacy of resources, including financial, human, material, equipment, and other essential resources, to guarantee project success (Boonstra, 2013). The backing of TM and the consistent provision of resources to project leaders consistently stand out as pivotal factors for achieving project success across diverse industries. Conversely, a nonexistence of support from TM is recognized as an important feature contributing to project failure (Belassi & Tukel, 1996).

2.4.2.2 Structural Arrangements

Structural arrangements refer to the organizational frameworks, procedures, and approaches used for project management. The arrangement of project structures has a substantial impact on the coordination, adaptability, and promptness of the project team. Dvir, Raz, and Shenhar, 2003 emphasize that having well defined project structures enables effective communication channels and decision-making processes, which are crucial for achieving project success. In addition, Serrador's (2013) study indicates that adaptable structural arrangements, such as those seen in agile approaches, enhance project results by successfully tolerating changes and uncertainties.

Senior management assumes responsibility for the establishment and refinement of appropriate procedures, processes, systems, and organizational structures. This strategic

initiative is designed to elevate overall organizational performance and confirm the effective accomplishment of projects (Boonstra, 2013). The active involvement of senior management in crafting and optimizing these essential frameworks is crucial for fostering an environment conducive to effective project execution. By setting and enhancing these structural elements, higher management contributes significantly to creating a foundation that supports not only successful project outcomes but also improved overall organizational performance (Ahmed & Mohamad, 2016; Ahmed et al., 2014; Ahmed & Philbin, 2022).

2.4.2.3 Communication

Efficient and clear communication among the TM, project team, and external stakeholders is crucial for the effective implementation of projects. The efficacy of communication impacts the precision of project goals, involvement of stakeholders, and synergy within the team.

"Communication," underscores the necessity for consistent and effective dissemination of possible procedures, scope adjustments, system changes, and organizational recommendations to the pertinent stakeholders. This communication process demands regular, precise, and proper interactions to ensure its effectiveness (Boonstra, 2013; Ahmed & Mohamad, 2016; Ahmed et al., 2014). Navigating through the construction industry poses a substantial challenge marked by the widespread issue of miscommunication among project stakeholders. The accomplishment of any project is intricately accompanying to the seamless flow of information, as it is frequently pinpointed as the underlying cause of discrepancies in numerous projects (Abdallah, Shaawat, & Almohassen, 2024). Recognizing this, the emphasis on clear and regular communication becomes not only a crucial component of project success but also a means to address challenges prevalent in the construction sector (Ahmed & Mohamad, 2016; and Ahmed et al., 2014; Ahmed & Philbin, 2022; Abdallah et al., 2024).

2.4.2.4 TM's Expertise

Belout and Gauvreau (2004) provide evidence that projects managed by teams with a high level of talent and experience have a greater likelihood of successfully achieving their goals and meeting the expectations of stakeholders.

"Expertise," it is imperative that TM possesses a comprehensive understanding of the project's scope, background, potential risks, and consequences. This profound knowledge equips them to apply the necessary skills and expertise within the project management field, ultimately contributing for successful projects (Boonstra, 2013; Ahmed & Mohamad, 2016; Ahmed et al., 2014). As emphasized by Lee et al. (2016), fostering knowledge sharing within an organization involves more than just educational efforts and incentives. It requires TM to

exemplify the desired behavior actively. They should serve as role models, embodying a culture of knowledge sharing. In this context, the expertise dimension not only highlights the importance of TM's understanding but also underscores their role as leaders who actively promote and participate in knowledge sharing within the organizational framework. (Ahmed & Mohamad, 2016; Lee et al.,2016; Boonstra, 2013).

2.4.2.5 Power

Power, in the context of project management, refers to the ability and influence PMs and upper management possess to direct project implementation and decision-making. Power distribution and utilization impact the dynamics of a team, the participation of stakeholders, and the execution of project plans. Shenhar et al. (2001) argue that providing PMs with the necessary authority and autonomy is crucial for successful leadership and project governance. On the other hand, an unequal allocation of power may result in disputes, opposition, and inefficiency, which can put the success of the project at risk.

"Power," the significance of TMS becomes evident, especially during crises and challenging periods. It is imperative for the senior management of the firm to wield their authority judiciously, leveraging their power to provide unwavering support to project leaders and their teams (Boonstra, 2013; Ahmed & Mohamad, 2016; Ahmed et al., 2014). During times of crisis, the exercise of managerial authority serves as a vital mechanism for reinforcing the project leader and team. This dimension acknowledges the pivotal role of senior management in wielding their influence and power to navigate and overcome challenges, ensuring the project's resilience and success (Ahmed & Mohamad, 2016; Ahmed et al., 2014; Lee et al.,2016). Nevertheless, the successful execution of expansive and intricate social sector projects demands the simultaneous demonstration of headship skills by PMs and the backing provided by TM (Ahmed & Philbin, 2022).

2.5 Summary

In Chapter 2, the literature study thoroughly examined the theoretical foundations and empirical literature related to the key elements influencing project performance in the construction sector. Empirical studies have highlighted the critical importance of TMS, resource allocation, structural organization, communication, TM's competence, and power in shaping project outcomes. The chapter carefully integrated information from multiple studies to highlight the relationship among these factors and their collective impact on achieving project goals. This comprehensive literature review laid a strong foundation for understanding the multifaceted nature of project success, paving the way for further exploration into how these factors contribute to the effective administration and implementation of construction

projects. The literature review examines the significance of analyzing project accomplishment in the building industry, shedding light on the interconnectedness of project scenarios, success metrics, and TMS. Various aspects of project success, as identified by different researchers, are elucidated and summarized.

The study emphasizes the enduring relevance of TMS, advocating for future research to explore TMS as a mediator or moderator variable across diverse sectors or specific countries. It also recommends exploring deeper into the limitations and challenges encountered by TM when supporting projects. Additionally, this chapter offers recommendations from prior researchers for future investigations, including expanding the scope of research to explore multi-dimensional TMS as a potential mediator or moderator variable across different sectors and countries. The significance of investigating TMS in the construction sector, particularly in the specific context of Sri Lanka, is highlighted.

The chapter conducted a thorough research and included information from several studies to emphasize the intricate relationship between these aspects and their combined influence on accomplishing project goals. The literature research established a strong basis for comprehending the complex characteristics of project success, paving the way for additional exploration into how these factors contribute to the efficient administration and implementation of construction projects.

3 METHODOLOGY AND DATA COLLECTION

3.1 Introduction

This section offers a comprehensive overview of the methods used in this study, explaining the reasoning behind each choice in a clear and logical manner. This section provides reasons for selecting the research philosophy, methodology, and strategy, along with discussing important aspects like reliability, validity, and ethical considerations for the current study.

This study conducts an extensive literature search on the relationship between TMS and project success, consistently finding a positive correlation. The current study examines various methodologies used in previous research studies, providing insights into the different approaches to investigating TMS and project success.

3.2 Problem identification and Research design

In Figure 3.1 below, I present the flow chart of research design that I implemented to design the research, commencing with problem discovery. This initial stage involved identifying the key issues or gaps in existing knowledge within the field of study. Through problem discovery, I pinpointed the areas that required further investigation. As the research questions took shape, the subsequent step involved conducting a comprehensive literature review on project success and TMS in construction organizations. Drawing insights from the literature review, I proceeded to collect data from existing literature. This phase entailed gathering empirical evidence through various methods such as surveys. The collected data served as the raw material for analysis, enabling me to explore the relationships between variables and test hypotheses. Subsequently, I developed a conceptual model that defined the hypothesized relationships between key variables. Following that, I refined the questionnaire based on feedback from the pilot survey before proceeding to the final data collection phase.

Once the data had been collected, I engaged in editing and coding to organize and structure the information for analysis. Data processing involved cleaning and transforming the data to make it suitable for statistical analysis. Subsequently, the data were analyzed using appropriate statistical techniques to test the hypotheses outlined in the conceptual model. The findings of the analysis were then discussed and validated in light of the existing literature, providing insights into the factors influencing project success and the role of TMS. Building on these findings, recommendations could be formulated for practitioners and policymakers, offering practical guidance for improving project outcomes in construction organizations. Finally, the research concluded with a summary of key findings, implications for theory and practice, and suggestions for future research directions.

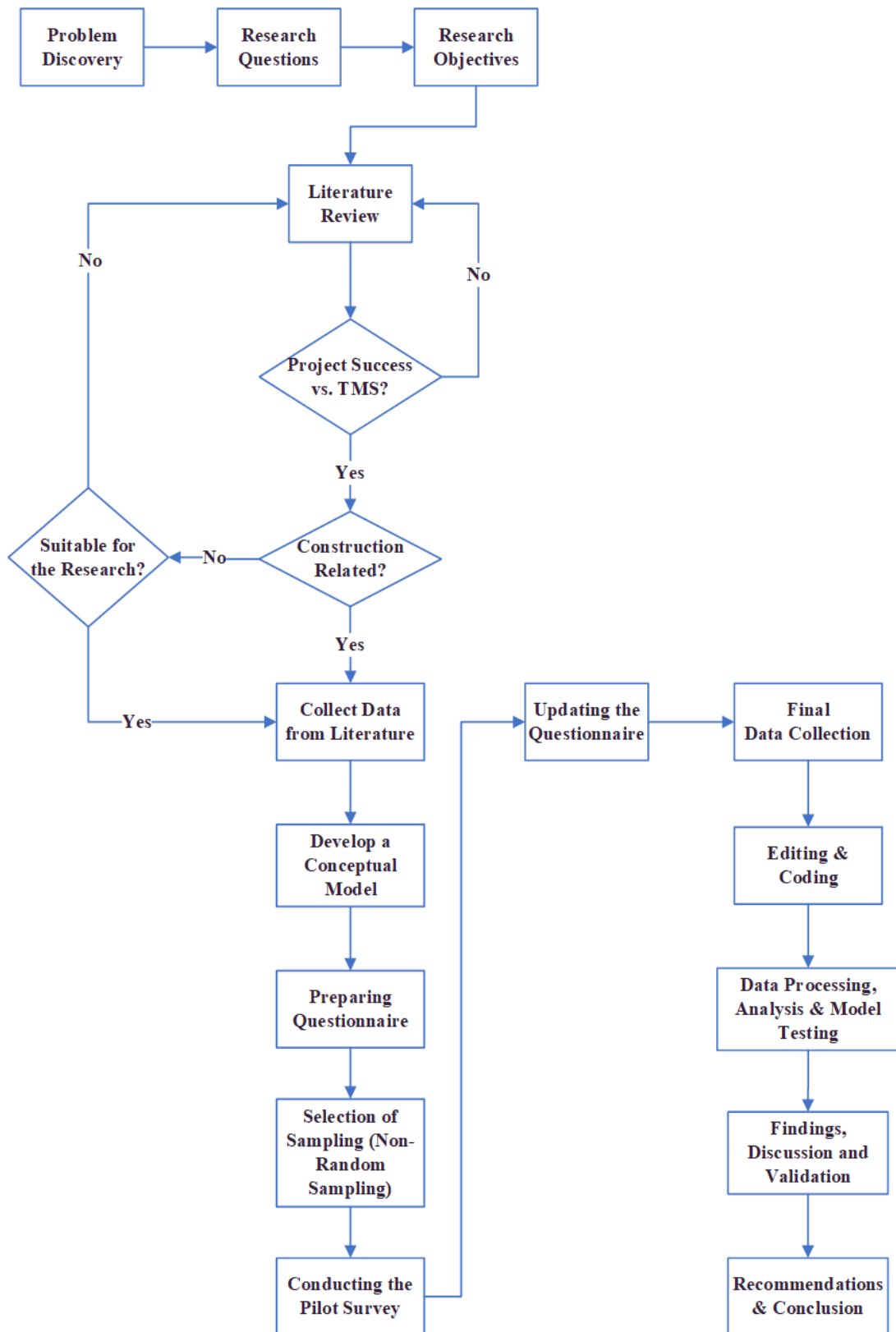


Figure 3.1: Approach to Problem Identification and Research Design

3.3 Conceptual Framework

In the preceding chapter, an extensive literature review of the study on TMS versus project success was conducted. The analysis comprehensively explored the theoretical and conceptual background underlying the principles of the present study. This chapter will undertake a thorough examination of the notions that will be explored in the current study. The conceptual framework is mentioned in the Figure 3.2.

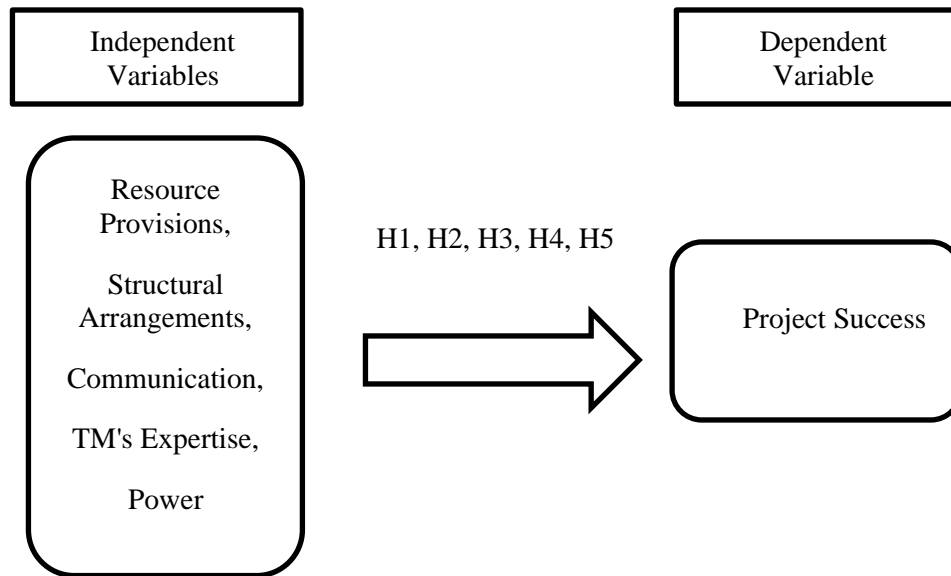


Figure 3.2: Conceptual Framework

3.4 Hypothesis Development

A hypothesis is a statement that postulates the presumed connection between two or more independent variables. The conceptual framework exhibited in Figure 3.2, along with the literature discussed in the previous chapter, is considered in formulating the hypotheses for the subsequent investigation.

H1 - There is a significant impact of TM supplying resources on project success.

H2 - There is a significant impact of TM establishing structural arrangements on project success.

H3 - There is a significant impact of effective communication by TM on project success.

H4 - There is a significant impact of offering the knowledge and expertise of TM to the project team on project success.

H5 - There is a significant impact of exercising the power of TM on project success.

3.5 Operationalization of Variables

The Table 3.1 displays the operationalization table used to construct indicators for measuring the variables described in the conceptual framework.

Table 3.1: Operationalization of Variables

Variable	Operational Definition	Measurement
Project Success	Assessment of Project Effectiveness: Examination of the efficiency of the project, the influence of project staff, client contentment, company accomplishments, and future prospects.	5 scale Likert scale : 1 - Strongly disagree, 2 – Disagree, 3 – Neutral, 4- Agree, and 5 – Strongly Agree
Resource Provisions	Evaluation of Resource Sufficiency: Analysis of the adequacy of resources allocated for the project, covering financial, physical, and human resources.	5 scale Likert scale : 1 – Not at all, 2 – Once in a while, 3 – Sometimes, 4 – Fairly often, and 5 – Frequently
Structural Arrangements	Assessment of Structural Efficiency: Examination of the effectiveness of structural arrangements within the project and the organization.	
Communication	Evaluation of the frequency and effectiveness of communication with stakeholders and within the project team.	
Expertise	Evaluation of proficiency in project management, technology, stakeholder management, and problem-solving.	
Power	Assessment of the extent of authority and influence in supporting the project team, facilitating procedures, and determining roles.	

3.6 Research philosophy and approach

I chose positivism as the research philosophy for its focus on empirical evidence and quantitative analysis, which aligns with the objective nature of project success research. Positivism was selected for this study because it prioritizes organized procedures and statistical or numerical analysis, which is in line with the objective character of the success of construction projects and TMS research. Positivism promotes a methodical approach that involves testing ideas using empirical methods. This ensures that the results are derived from real evidence rather than subjective interpretations (Smith, 2015). These factors are very important in the research, since they directly impact measurable results such as project efficiency, allocation of resources, and TM dynamics (Hughes, 2016).

In addition, positivism advocates for the use of extensive samples, which improves the potential to apply the results to a wider context. This is particularly important in this research, since it aims to make more comprehensive conclusions regarding project management techniques (Saunders, Lewis, & Thornhill, 2012). The positivist approach is also compatible with the use of statistical tools and procedures, which are important for analyzing the intricate data sets often encountered in project management research (Bell, 2014).

The deductive methodology was chosen to formulate hypotheses based on existing theories and test them through empirical observation, make it particularly suitable for quantitative research in project management in the construction sector. The deductive method, a fundamental principle in scientific inquiry, involves formulating a hypothesis derived from established theory, and then subjecting it to empirical observation for testing (Bryman, 2012). This strategy is often used in research that prioritizes a logical framework and allows for the formulation of hypotheses based on current information or theories (Saunders et al., 2012).

Considering the subject of this research on project success and TMS, which relates to construction project management, the deductive technique is the most suitable choice since it aligns with the previously described positivist ideology. The deductive approach enables the formulation of hypotheses based on theoretical frameworks or existing literature in project management, which are then subjected to empirical testing (Robson & McCartan, 2016).

Furthermore, the deductive technique is advantageous for quantitative research as it entails gathering and analyzing numerical data to examine hypotheses (Creswell, 2014). This is consistent with the study's objective to objectively evaluate many facets of project success, including efficiency, client's satisfaction, direct organizational and business success, future prospects, teams satisfaction, and TMS including, power, expertise, organizational arrangements, communication, and resource allocation. The deductive approach prioritizes

quantifiable and observable events, guaranteeing that research conclusions are based on empirical data, hence increasing their trustworthiness (Bell, 2014).

3.7 Research Strategy and Research Method

This research employs the survey strategy, which is generally acknowledged and efficient for gathering data across many academic disciplines. The use of questionnaires as a survey technique is essential in social and management research. It provides a systematic approach to collecting data from a large sample, which guarantees a thorough comprehension of the study topic (Bryman, 2012).

This method is in perfect harmony with the logical approach and positivist philosophy that form the foundation of this work. It enables the empirical examination of hypotheses using quantitative data (Saunders et al., 2012). Questionnaire surveys play a crucial role in gathering standardized data, which is necessary for maintaining consistency and dependability in replies. This, in turn, improves the validity of the study results (Creswell, 2014).

Furthermore, surveys enable the gathering of data from a wide range of participants, which is crucial for collecting varied viewpoints on project success and TMS. The scope of this study is essential for ensuring generalizability and making thorough findings on the practices and issues in the area (Robson & McCartan, 2016). The systematic format of questionnaires, characterized by preset questions, guarantees the collection of data in an organized way, facilitating uncomplicated analysis and interpretation (Bell, 2014). In addition, Ahmed et al. (2014) and Ahmed and Mohamad (2016) have used questionnaire surveys to collect the primary data in their research studies on project success and TMS.

3.8 Time horizon

The research time horizon employed in the current study is a cross-sectional time horizon. Cross-sectional time horizon involves gathering and analyzing data at a specific moment or during a brief timeframe, offering a picture of the phenomena being studied (Saunders et al., 2012). This methodology is very common in the fields of social sciences and business research. Its purpose is to evaluate the present condition or comprehend the connections between variables at a certain moment (Bryman, 2012).

For this research, a cross-sectional time horizon is the best choice since it efficiently and effectively collects data from a large sample within a restricted duration. This methodology is compatible with the survey strategy and the deductive research technique, which enable the empirical verification of hypotheses using data gathered at a certain moment in time (Robson & McCartan, 2016). The cross-sectional approach is well-suited for studies that attempt to

investigate present trends, attitudes, or practices, such as this study that aims to comprehend current TM practices and issues (Creswell, 2014).

In addition, R. Ahmed et al. (2014) and Ahmed and Mohamad (2016) have used the cross-sectional time horizon in their research studies on project success and TMS.

Furthermore, the use of the cross-sectional technique offers benefits in terms of resource and time effectiveness, which is a crucial factor to be taken into account for this research. The technology facilitates the fast gathering and examination of data, allowing prompt deductions and suggestions (Bell, 2014). Although it may not account for temporal changes, the cross-sectional methodology offers a robust basis for comprehending the present condition of TM practices on project success and may guide future longitudinal research (Kerzner, 2017).

3.9 Methodological choice

This research employs a mono-method quantitative methodology. The mono-method quantitative approach is characterized by the only use of quantitative data and analytical methodologies to investigate the research topic (Bryman, 2012). This methodology is especially appropriate for doing research that aims to measure variables and examine hypotheses via the use of statistical techniques (Creswell, 2014).

For this study on project success, the most suitable methodology is the mono-method quantitative approach. This is because it aligns with the positivist research philosophy and follows a logical research style. This methodological approach enables the empirical examination of hypotheses produced from the theoretical framework, using organized and standardized data collection instruments such as questionnaires (Saunders et al., 2012). The quantitative character of this technique allows for the assessment of factors such as project success, TMS, including resource allocation, structural arrangements, communication, expertise, and power, which are essential to this research.

Moreover, the mono-method quantitative approach enables the use of statistical analysis to investigate the connections between variables, evaluate patterns, and make inferences based on numerical data (Robson & McCartan, 2016). This is especially pertinent in the field of project management research, where the goal is to get insights that are both generalizable and objective and can be used to improve practice and policy (Bell, 2014).

Moreover, the mono-method quantitative approach has the benefit of easily managing huge datasets, enabling the analysis of data from a wide-ranging sample. This increases the applicability of the results and adds to the strength of the study (Kerzner, 2017).

3.10 Population and Sample

In a research study, the population refers to the whole set of persons or occurrences that the research results aim to apply to. Within the scope of this study, the population is delineated according to certain criteria that are pertinent to the research aims. These criteria may include people working in the construction business or organizations involved in construction project management endeavors. The accurate demarcation of the population is of utmost importance as it directly impacts the significance and practicality of the study outcomes in relation to the real-life scenario (Bryman, 2012).

In this part, the importance of the sampling approach, which involves selecting a specific subset of the population to gather data from, is emphasized. Due to practical limitations like time and money, it is crucial to have a well-planned sampling approach in order to correctly reflect the larger population while collecting data. This study utilizes a particular sampling strategy that is supported by its appropriateness to the research design and aims. This technique ensures that the sample is dependable for making inferences and generalizations (Saunders et al., 2012).

Finally, this part provides a detailed explanation of the characteristics and categories of data that were gathered for the research. The data primarily comprises numerical or measurable information, collected using organized instruments such as surveys, in accordance with the mono-method quantitative approach. The nature of the data is intricately connected to the research questions and hypotheses, guaranteeing that the data gathered is relevant and enough to tackle the study goals (Creswell, 2014).

3.10.1 Population

The study's research population consists of professionals employed in the construction industry, with a special emphasis on those in construction project management positions or senior management positions at construction companies. This demographic was selected based on its relevance to the study's objective of investigating TM practices and difficulties. The construction business, renowned for its intricate project settings and varied stakeholder interests, offers an abundant setting for analyzing project management dynamics (Kerzner, 2017).

The rationale for choosing this demographic is based on the distinct attributes of the construction industry, such as its project-oriented work arrangements, the need for efficient allocation of resources, and the crucial significance of timely project completion (Smith, 2015). The research focuses on professionals in various roles, such as PMs, engineers, architects, and

senior managers, who face a range of obstacles and use different tactics to achieve project success. This group is considered appropriate for the study (Hughes, 2016).

The construction sector plays an important role in global economic growth, and the successful management of construction projects is crucial for this contribution (Saunders et al., 2012). The construction industry accounts for almost 13% of the global GDP, as stated by the World Economic Forum (2018), underscoring its economic importance. Moreover, according to the Project Management Institute (PMI, 2017), the use of project management methods in construction has a substantial influence on project results, highlighting the importance of examining this group.

The research intends to get insights that are both academically relevant and practically helpful in enhancing TM procedures to ensure the success of the projects while obtaining the TMS by specifically targeting experts in the construction sector. This group offers a thorough comprehension of the difficulties and tactics in project management, hence enhancing the existing knowledge base in the sector (Bryman, 2012).

3.10.2 Sample and Sample Size

The research used a convenience sampling and snow ball sampling strategies, which are non-probability sampling methods, to choose its sample from the selected community of professionals in the construction business (Saunders, et al., 2012). Convenience sampling is used because of its practicality and efficiency, especially for investigations where easy access to participants is an important factor (Bryman, 2012). Also, snowball sampling is used to collect the data from relevant individuals of construction sector. Convenience sampling is a strategy that includes choosing participants who are easily accessible and eager to participate. This approach is cost-effective and time-efficient (Saunders et al., 2012). The construction business, characterized by experts with busy schedules, has difficulties conducting random or stratified sampling. Therefore, this technique is very beneficial in this sector (Robson & McCartan, 2016). Although convenience sampling may lack the same degree of representativeness as probability sampling approaches, it is nonetheless useful for exploratory research and early hypothesis testing, particularly when time and resources are limited (Bell, 2014).

The rationale for using convenience sampling is also rooted in its versatility and adjustability, enabling researchers to collect a diverse array of answers from different sectors within the construction industry. Examining various viewpoints and methodologies in project management might provide significant insights (Creswell, 2014). It is crucial to recognize the possibility of sampling bias that is inherent in convenience sampling, since the sample may not accurately reflect the overall population (Kerzner, 2017).

When determining the sample size, it is important to find a middle ground between having a large enough sample to assure statistical significance and considering the practical limitations of the research.

The current study utilizes the survey strategy for its efficiency in gathering quantitative data, with questionnaires designed to collect standardized information from professionals in the construction industry. This study employs a cross-sectional time horizon to gather data at a specific moment, providing insights into current trends and practices. The study employs a survey questionnaire targeting individuals involved in the construction industry, such as engineers, PMs, consultants, and senior management. A total of 100 responses were collected, reaching data saturation.

The size of this sample is sufficiently large to provide a wide array of answers that may be analyzed in a meaningful manner. However, it is still manageable within the logistical and resource constraints of the research. The sample size in this study is in line with other research in TMS and project success that has effectively used comparable or smaller samples to get meaningful results (Smith, 2015).

3.11 Data, preparation of questionnaire and data collection

The research utilizes a standardized questionnaire as the main method for gathering data. The technique described is generally acknowledged for its efficacy in collecting quantitative data, especially in research that follows a positivist ideology and a deductive methodology (Bryman, 2012). The use of a structured questionnaire facilitates the gathering of standardized data, guaranteeing uniformity and the capacity to compare replies. This is of utmost importance for the statistical examination necessary in this research (Saunders et al., 2012).

The questionnaire is specifically crafted to have closed-ended questions, which not only make it easier for participants to respond but also simplify the process of analyzing the data. This method is especially appropriate for the setting of the construction sector, because the time available for respondents may be restricted (Creswell, 2014). The use of questionnaires in the research is consistent with the mono-method quantitative approach, which guarantees that the data gathered is unbiased and measurable (Robson & McCartan, 2016).

In addition, for this study, Boonstra (2013)'s multidimensional TMS framework and Shenhar and Dvirs (2007)'s multidimensional project success model was used to develop the survey questionnaire as appropriate to Sri Lankan context. (Ahmed et al., 2014; Ahmed and Mohamad, 2016). The questionnaire is designed in three parts. Part 1 is to collect general information about

the respondent, Part 2 is to measure project success; and Part – 3 is to measure the support of higher-level management. The survey questionnaire is attached as Appendix 1.

A summary of the questionnaire is mentioned in Table 3.2.

Table 3.2: Structure of the Survey Questionnaire

Description		Number of questions	Objective
General Information of the Respondent		6	
Information about the projects referred to in the study		3	
Project Success aspects	Project efficiency, customer/ client satisfaction, impact on project staff, direct organizational and business achievement, preparing for the future	22	1, 2
Multi Dimensions on TMS	Resource Provisions	4	
	Structural Arrangements	4	
	Communication	4	
	Expertise	4	
	Power	4	
Limitations and challenges of TM and practices that used to overcome challenges and limitations		3	3,4

3.12 Data Analysis

This section holds paramount importance as it furnishes a thorough elucidation of the methodology and statistical techniques employed for data analysis, effectively transforming raw data into meaningful discoveries. The analytical process is meticulously designed to ensure the achievement of study objectives and the establishment of robust, trustworthy, and valid results. Examining the data not only yields insights into the validity and reliability of the constructs, as underscored by Sekaran and Bougie (2016), but also enables the study to confidently retain only the most relevant information, discarding the rest securely. Adopting this approach facilitates the evaluation of measurement accuracy based on the acquired values. The findings are derived employing the SPSS and Microsoft Excel for the statistical analysis. SPSS is a widely used choice for conducting statistical analysis on extensive research data (Saunders et al., 2012; Ahmed & Mohamad, 2016; Ahmed et al., 2014). Hence, the research utilizes powerful statistical software and adheres to strict data analysis standards, as recommended by Wooldridge (2015).

In addition, the respondents' educational qualifications, professional qualifications, positions within their organizations, and experience in the construction industry are systematically analyzed and summarized. This includes tables detailing the distribution of educational qualifications, professional certifications, positions, and experience levels among respondents.

3.12.1 Descriptive Statistics

The use of descriptive statistics in this research is very suitable as it imparts a basic comprehension of the data by concisely summarizing its principal characteristics. Descriptive statistics, such as mean, median, mode, standard deviation, and range, provide a first overview of the data set, revealing basic patterns and trends (Bryman, 2012). This methodology is especially appropriate for this research since it enables the initial evaluation of the data, guaranteeing the early detection of any irregularities or extreme values throughout the analysis procedure (Saunders et al., 2012). Descriptive statistics aid in comparing data across various groups in the sample, which is crucial for comprehending the varying viewpoints within the construction business (Creswell, 2014).

The following techniques were employed to conduct an in-depth analysis and compile the data:

- Mean
- Standard Deviation
- Skewness
- Kurtosis

3.12.2 Empirical Strategy

The methodology used in this work revolves on the utilization of Ordinary Least Squares (OLS) regression, a statistical technique often employed in quantitative research to estimate the associations between a dependent variable and one or more independent variables (Wooldridge, 2015). The use of OLS regression is appropriate for this study as it enables the examination of hypotheses derived from the theoretical framework, offering valuable insights into the magnitude and characteristics of the associations among variables such as project success, resource allocation, and TM (Saunders et al., 2012). In addition, R. Ahmed et al. (2014) and Ahmed and Mohamad (2016) have used regression analysis and correlation in their research study on Project success and TMS.

The regression equation for the developed hypothesizes, using standard statistical symbols, is represented as:

Project Success

$$\begin{aligned} &= \beta_0 + \beta_1(\text{Resource Provisions}) \\ &+ \beta_2(\text{Structural Arrangements}) + \beta_3(\text{Communication}) \\ &+ \beta_4(\text{Project Team's Expertise}) + \beta_5(\text{Power}) + \varepsilon \end{aligned}$$

Here, the TMS was assessed using five independent variables: resource provisions, structural arrangements, communication, TM's expertise, and power.

- β_0 is the intercept, the value of Y when all independent variables are zero.
- $\beta_1, \beta_2, \beta_3, \beta_4,$ and β_5 are the coefficients for the independent variables.
- These coefficients measure the impact of a one-unit change in the independent variable on the dependent variable, assuming all other variables are held constant.
- ε is the error term, accounting for the variation in Y not explained by the independent variables.

3.12.3 Inferential Statistics

In this study, we primarily rely on inferential statistical methods to assess reliability, validity, and hypothesis testing. The subsequent analysis incorporates a variety of systematically applied approaches, techniques, and processes throughout the research. (Saunders et al., 2012)

- **Correlation analysis**
Correlation coefficients are computed to examine the relationships between project success and various TMS components. The analysis identifies significant positive correlations, indicating the strength of the relationships.
- **Regression diagnostic**
Regression diagnostics are essential for ensuring the reliability and validity of regression models by checking assumptions, detecting influential observations, and addressing potential issues that may affect the model's performance.
- **Regression analysis**
Regression analysis was employed to estimate the associations between project success and TMS variables, facilitating hypothesis testing and inference. A multiple regression analysis is conducted to examine the impact of TMS components on project success. Model statistics, coefficients, standardized coefficients, t-values, and significance levels are reported to assess the strength and significance of relationships.

3.12.4 Reliability and Validity

The study examines the essential elements of reliability and validity, which are crucial to guaranteeing the legitimacy and trustworthiness of the research results. Reliability pertains to the degree of consistency in measurement, while validity relates to the correctness of the measurement in capturing its intended meaning (Bryman, 2012).

To ensure reliability, the research employs the test-retest approach, in which a preliminary test of the questionnaire is conducted before the primary survey. This methodology enables the detection and correction of any discrepancies in the questionnaire, as suggested by Saunders et al. (2012). Additionally, researchers use Cronbach's alpha to evaluate the internal consistency of the scales used in the questionnaire, ensuring that the items within each scale consistently measure the same underlying concept (Creswell, 2014). Hence, I use the reliability test (Cronbach alpha) to ensure the internal consistency of the survey questionnaire in addition to test-retest approach.

To ensure validity, the research examines content validity. Content validity is established by conducting a comprehensive literature review throughout the questionnaire design process, ensuring that the questions sufficiently cover all facets of the study issue (Robson & McCartan, 2016).

3.13 Methodological Challenges

The study recognizes and addresses certain significant obstacles inherent in the research approach. An important obstacle is the possibility of bias in data collection, especially when using convenience sampling and snow-ball sampling (Bryman, 2012). To address this issue, a meticulously prepared questionnaire is utilized aiming to reduce subjective interpretation and ensure that the gathered data is as unbiased and inclusive as possible given the limitations of the sampling technique (Saunders et al., 2012).

Another obstacle is ensuring the reliability and accuracy of the data gathered through the survey. To tackle this issue, the questionnaire undergoes a thorough examination in a pilot study to ensure clarity and ease of understanding. This process allows for any necessary improvements to be made before the questionnaire is distributed on a larger scale (Creswell, 2014). This stage ensures that the questions are understood as intended and that the responses accurately reflect the opinions of the participants.

Moreover, the research faces the challenge of analyzing complex datasets, particularly in the use of correlation and multiple regression analysis. To ensure precise and meaningful analysis, the research utilizes powerful statistical software and adheres to strict data analysis standards,

as recommended by Wooldridge (2015). This includes assessing for multicollinearity, homoscedasticity, and other relevant factors that may impact the reliability of the regression findings (Saunders et al., 2012).

3.14 Ethical considerations

The study thoroughly examines the ethical aspects related to conducting research, specifically within the context of a survey conducted within the construction business. The importance of ethical issues cannot be overstated when it comes to maintaining the honesty and reliability of the research process and its outcomes (Bryman, 2012).

Preserving participants' confidentiality and anonymity is a crucial ethical consideration in this investigation. To address this issue, participants are assured that their answers will remain anonymous and that their personal data will not be revealed in any manner. This approach aligns with the ethical standards proposed by Saunders et al. (2012), which emphasize the significance of safeguarding participant anonymity, particularly in industry-related research where confidential data may be involved.

Another crucial ethical concern is obtaining informed consent. Participants are provided with a concise explanation of the study's objectives, the extent of their participation, and their right to withdraw at any point without facing any repercussions. This approach is consistent with Creswell's (2014) guidelines for ethical research, ensuring that participants have a comprehensive understanding of the study's scope and their involvement in it.

Additionally, the research adheres to the principles of non-maleficence, ensuring that the volunteers would not experience any harm due to their participation.

3.15 Chapter Summary

Chapter 3 provides a detailed explanation of the research framework used in the study, offering a thorough review of the methodologies and procedures employed. The text elucidates the positivist research philosophy and the deductive technique, providing reasons for their appropriateness for the study's aims. The chapter outlines the use of a mono-method quantitative approach, which entails employing convenience sampling and structured questionnaires to gather data from experts in the construction sector. The study addresses methodological obstacles, ethical factors, and ensures reliability and validity by utilizing suitable statistical tests and metrics. Overall, the chapter establishes a robust basis for the research, ensuring that the methodologies used are thorough, organized, and aligned with the study's aims to investigate TM practices.

4 ANALYSIS AND DISCUSSION OF RESULTS

Chapter 4 serves as a key segment of this study, where the gathered data is precisely divided and interpreted to unveil insights into the realm of construction project success vs. senior management support. This chapter is methodically structured to first present details on the sample population, including education level, professional qualifications, experience, position, the type and role of the organization, and details of the project in the study. Following this, the chapter advances into a deeper exploration through correlation and regression analysis, aiming to unravel the intricate relationships and impacts of key variables such as project success and senior management support modes, including supplying resources, establishing structural arrangements, facilitating effective communication, offering expertise, and exercising power.

Through this analytical journey, the chapter not only illuminates the prevailing trends and patterns within the dataset but also serves as a guide towards a deeper comprehension of the underlying factors driving successful project outcomes. By systematically analyzing the data and finding out the complex relationships between project success and senior management support, this chapter provides invaluable insights that can inform strategic decision-making and enhance operational effectiveness within construction organizations. Moreover, it provides a strong empirical foundation upon which future research endeavors can build, contributing to the continuous evolution and refinement of TM practices within the construction industry.

4.1 Analysis of Data

4.1.1 Data collection

The survey questionnaire was precisely crafted to target individuals actively engaged in the construction industry, including engineers, PMs, consultants, and senior management personnel within construction companies. To identify suitable survey participants, non-random sampling methods were employed, encompassing direct outreach to company management and the utilization of the snowball sampling technique (Saunders, et al., 2012).

By leveraging these approaches, a total of 100 responses were successfully gathered, ensuring robust data representation and statistical significance. Furthermore, the saturation of responses indicates a comprehensive coverage of perspectives and experiences within the construction industry, enhancing the reliability and validity of the findings obtained from the survey.

4.1.2 Demographic information

Table 4.1 shows the demographic information of the respondent.

Table 4.1: Summary of the Demographic Data

No	Description		% of respondents
1	Education Level	Bachelor's degree related to construction	100%
		Masters related to construction	32%
		Diploma related to construction	6%
2	Professional qualifications (65 respondents)	Chartered Engineer, IESL	62%
		PMP qualified	7%
		International Professional Engineer	4%
		Chartered Quantity Surveyor	2%
3	Position	Project Engineer/ Resident Engineer	54%
		Project Manager/Project Director/Senior Project Manager	33%
		Director/ Managing Director / General Manager /Chief Executive officer	8%
		Design/ Senior Design Engineer	5%
4	Experience	11 to 15 years	30%
		5 to 10 years	29%
		Less than 5 years	22%
		16 to 25 years	17%
		More than 25 years	2%

4.1.2.1 Education Level

As per Table 4.1, the educational composition of the sample indicates that the majority of respondents hold a bachelor's degree (100%) and 32% have a master's degree, while a substantial minority (6%) have a diploma-related construction.

In addition, it can be stated that a considerable majority of survey participants, totaling 65%, have successfully acquired only a bachelor's degree and 29% hold both a bachelor's and a master's degree, with a specific focus on construction-related disciplines. Further, 3% of respondents hold "diplomas and bachelor's degrees related to construction" and "diplomas, bachelor's degrees, and related master's degrees."

4.1.2.2 Professional qualifications

Out of 100 respondents, only 65 individuals have obtained additional professional qualifications. This indicates that 65% of the surveyed participants have pursued further credentials beyond their initial academic achievements. (see Table 4.1)

In addition, a significant majority, comprising 85% of respondents (55 respondents), hold only the title of Chartered Engineer. Furthermore, 6% of respondents possess a combination of qualifications, including Chartered Engineer, IESL, and PMP qualifications. Another 5% have the combination of Chartered Engineer, IESL, and International Professional Engineer. Additionally, there is a 2% representation for those holding the qualifications of Chartered Engineer, IESL, International Professional Engineer, and PMP qualified, respectively. Lastly, 2% of respondents are Chartered Quantity Surveyors, and 2% hold only the PMP qualification.

4.1.2.3 Position of the respondent

The majority of respondents hold positions as Project Engineers/Resident Engineers (54%), followed by Project Directors/Project Managers/Senior Project Managers (33%), and Directors/Managing Directors/General Managers/Chief Executive Officers (8%). A substantial minority is represented by design engineers and senior design engineers (5%). This distribution is cumulative, with each category adding to the total percentage, culminating at 100%. (see Table 4.1)

4.1.2.4 Experience in the construction industry of the respondent

Table 4.1 offers additional insights into the experience composition of the sample. It discloses that the most prominent group of respondents (30%) possesses "11 to 15 years" of experience, closely followed by those with "5 to 10 Years" (29%). Representations for the categories "Less than 5 years" and "16 to 25 years" stand at 22% and 17%, respectively. Notably, the category "More than 25 Years" exhibits the least representation, with only 2% of respondents falling into this limit. This distribution is cumulative, with each category adding to the total percentage, culminating at 100%.

4.1.3 Summary of the organization and projects referred to the study

Table 4.2 shows the details of the organization and project referred to by each respondent.

Table 4.2: Details of the organization and projects

No	Description		Percentage
1	Organization Type	Private construction company	75%
		Semi-government organization	17%
		Government organization	6%
		Design firm	1%
		Private consultancy company	1%
2	Specialized grade in CIDA	C1 and above	42%
		C4 to C2	27%
		Below C4	16%
		Other	15%
3	Project Type	National Highways or Expressways or Rural roads	40%
		Buildings or apartments	22%
		Bridges or viaducts	17%
		Other	13%
		Water supply and sewerage systems	7%
		Irrigation system and drainage canals	1%
4	Budget of the Project	Below Rs. 200 Mn	55%
		Rs. 200 Mn - 500 Mn	29%
		Rs. 500 Mn - 1000 Mn	14%
		Over Rs. 1000 Mn	2%
5	Duration of the Project	1 to 2 years	46%
		Less than 1 year	41%
		2 to 5 years	13%

The majority of organizations (75%) are private construction companies, followed by semi-government organizations (17%), government (6%), and a minimal representation (1%) of private consultancy companies' and design firms. This distribution is cumulative, with each category contributing to the total percentage, culminating at 100%.

Furthermore, a notable 42% of the organizations represented by respondents fall into the 'C1 and above category,' signifying a significant presence of individual organization with advanced specialization. Following closely, 27% are positioned within the 'C4 to C2' range, indicating a substantial group. Additionally, 16% of the organizations represented by respondent's organizations are categorized under the 'Below C4' category. The "other" category encompasses 15% of the organizations represented by respondents. This breakdown provides a comprehensive overview of the diverse specialization levels within the surveyed organizations.

Again, this distribution is cumulative, with each category contributing to the total percentage, culminating at 100%.

Moreover, the majority of projects referred to in the sample are related to rural roads (23%), national highways or expressways (17%) and buildings or apartments (22%). In addition, 17% of projects are referred to as related to bridges or viaducts. A significant majority, comprising 55% of respondents, reported projects with a budget below Rs. 200 million. Following closely, 29% of respondents manage projects with budgets ranging from Rs. 200 million to Rs. 500 million. Finally, the distribution of project durations among respondents shows that the majority of projects, accounting for 46% of projects fall within the 1 to 2-year range. Following closely, 41% of projects fall within the less than 1 year range.

4.1.4 Descriptive statistic on Variables

Table 4.3 shows the descriptive statistics of variables.

Table 4.3: Descriptive statistics of the variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Project Success	100	3.5860	0.53504	-0.734	0.241	0.383	0.478
Providing Resources	100	3.4100	0.56466	-0.324	0.241	0.890	0.478
Structural Arrangements	100	3.4600	0.68046	-0.843	0.241	2.527	0.478
Communication	100	3.4450	0.55571	-0.499	0.241	-0.058	0.478
Expertise	100	3.5575	0.53872	-1.312	0.241	4.225	0.478
Power	100	3.4075	0.58781	-1.551	0.241	4.466	0.478
Valid N (listwise)	100						

Project Success has a mean score of 3.5860, indicating moderate project success among the sampled projects. The TMS components (Providing Resources, Structural Arrangements, Communication, Expertise, Power) have mean scores ranging from 3.4075 to 3.5575, suggesting moderate levels of TMS effectiveness.

The mean value of 3.5860 indicates the average level of project success. The standard deviation of 0.53504 suggests the extent of variability in the responses. Further, the negative skewness (-0.734) indicates a slight leftward skew, and the kurtosis of 0.383 suggests a moderately peaked distribution.

The descriptive statistics for the variable "Providing Resources" provide valuable insights into its distribution within the dataset. The mean value of 3.4100 represents the average level of providing resources. The standard deviation, at 0.56466, indicates the degree of variability or spread of responses around the mean. The skewness of -0.324 suggests a slight leftward skew in the distribution, indicating a tendency towards lower values. The kurtosis value of 0.890 signifies a moderately peaked distribution with tails that are slightly heavier than those of a normal distribution.

The statistics for the variable "Structural Arrangements" reveal important characteristics based on the provided data. The mean value of 3.4600 indicates the average level of structural arrangements within the dataset. The standard deviation, measuring at 0.68046, suggests a notable degree of variability or dispersion in the responses. The skewness value of -0.843 indicates a slight leftward skew in the distribution, suggesting a tendency toward lower values. The kurtosis of 2.527 suggests a distribution that is moderately peaked and has heavier tails compared to a normal distribution.

The descriptive statistics for the variable "Communication" provide insights into its distribution within the dataset. The mean value of 3.4450 signifies the average level of communication. The standard deviation, at 0.55571, indicates the degree of variability or spread of responses around the mean. The skewness value of -0.499 suggests a slight leftward skew in the distribution, indicating a tendency towards lower values. The kurtosis value of -0.058 implies a distribution that is less peaked than a normal distribution, with tails that are slightly lighter.

The descriptive statistics for the variable "Expertise" provide valuable insights into its distribution within the dataset. The mean value of 3.5575 represents the average level of expertise. The standard deviation, at 0.53872, indicates the degree of variability or spread of responses around the mean. The skewness value of -1.312 suggests a significant leftward skew in the distribution, indicating a tendency towards lower values. The kurtosis value of 4.225 indicates a distribution that is highly peaked and has heavier tails than a normal distribution.

The descriptive statistics for the variable "Power" provide important insights into its distribution within the dataset. The mean value of 3.4075 signifies the average level of power. The standard deviation, at 0.58781, indicates the degree of variability or spread of responses around the mean. The skewness value of -1.551 suggests a significant leftward skew in the distribution, indicating a tendency towards lower values. The kurtosis value of 4.466 indicates a distribution that is highly peaked and has heavier tails than a normal distribution.

Negative skewness values for some variables (e.g., Expertise and Power) suggest that there may be challenges or limitations that are more severe or negatively perceived by TM's. Kurtosis

values indicate the degree of peakedness or flatness of the distribution. Positive kurtosis values (for Structural Arrangements and Power) suggest a relatively peaked distribution of responses. Overall, the findings suggest that there is a moderate to high level of TMS effectiveness in Sri Lankan construction projects, with certain components being more established than others.

4.1.5 Reliability test on Variables

Table 4.4 shows the Reliability test on variables.

Table 4.4: Reliability test on the variables

Variables	Cronbach's Alpha	No Items
Providing resource	.792	5
Structural arrangement	.848	4
Communication	.798	4
Expert	.674	4
Power	.779	4
Project success	.943	22

The reliability coefficient (Cronbach's Alpha) for "Project Success" is .943, indicating a high level of internal consistency among the items measuring project success. This high reliability suggests that the measurement of project success is consistent and reliable within the context of Sri Lankan construction projects. Also, it indicates that the construct is well-defined and represents a robust measure of project success within the context of the study and it strengthens the validity of any observed relationships with other variables, such as those related to TMS. The reliability coefficients for various components of TMS range from .674 to .848. These reliability coefficients indicate moderate to high levels of internal consistency among the items measuring each TMS component and these coefficients suggest that the measurement of TMS components is consistent and reliable within the context of Sri Lankan construction projects. Therefore, the identified components of TMS represent robust measures of various aspects of team management practices in Sri Lankan construction projects.

4.1.6 Correlation Analysis

Table 4.5 shows the Correlation among variables.

Table 4.5: Correlation among variables

		Project Success	Providing Resources	Structural Arrangement	Communication	Expertise	Power
Project Success	Pearson Correlation	1	.673**	.703**	.876**	.881**	.789**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	100	100	100	100	100	100
Providing Resources	Pearson Correlation	.673**	1	.475**	.662**	.557**	.522**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	100	100	100	100	100	100
Structural Arrangement	Pearson Correlation	.703**	.475**	1	.657**	.640**	.606**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	100	100	100	100	100	100
Communication	Pearson Correlation	.876**	.662**	.657**	1	.835**	.748**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	100	100	100	100	100	100
Expertise	Pearson Correlation	.881**	.557**	.640**	.835**	1	.777**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	100	100	100	100	100	100
Power	Pearson Correlation	.789**	.522**	.606**	.748**	.777**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).							

The correlation analysis reveals significant positive correlations between project success and all components of TMS. The correlation coefficients range from 0.673 to 0.881, indicating moderate to strong positive relationships between project success and each TMS component. These findings suggest that a stronger TMS is associated with higher project success in Sri Lankan construction projects. The significant positive correlations indicate that the industry practices and operating procedures related to TMS components are conducive to project success in Sri Lankan construction projects. Also, it suggests that strengthening TMS effectiveness can help overcome limitations and challenges faced by TMs in the Sri Lankan construction industry.

4.1.7 Regression diagnostic

4.1.7.1 Multi- collinearity

Table 4.6 shows the Multi – collinearity of the variables.

Table 4.6: Multi - collinearity

Model	Tolerance	VIF
1 (Constant)		
Providing Resources	.558	1.793
Structural arrangements	.526	1.903
Communication	.223	4.483
Expertise	.245	4.084
Power	.355	2.817

The multicollinearity diagnostics for the specified model reveal important information about the independence of the predictor variables. Tolerance values ranging from 0.223 to 0.558 suggest that the variables "Communication" and "Expertise" may potentially be exhibiting multicollinearity concerns, as their values approach the lower limit. Additionally, examining the Variance Inflation Factor (VIF) supports this observation, with "Communication" and "Expertise" showing VIF values of 4.483 and 4.084, respectively, surpassing the commonly used threshold of 4 or 5 and below 10. While "Providing Resources," "Structural Arrangements," and "Power" exhibit higher tolerances and lower VIF values, indicating lower risk of multicollinearity.

The moderate to low multicollinearity indicated by the tolerance and VIF values suggests that the TMS components may be relatively independent of each other in the regression model. This implies that the industry practices and operating procedures associated with each TMS component may have distinct influences on project success in Sri Lankan construction projects.

4.1.7.2 Homoscedasticity

Figure 4.1 shows the homoscedasticity condition which is crucial for the validity of regression analysis, as it ensures the reliability of the estimated coefficients and the accuracy of statistical inferences drawn from the model. The residuals are normally distributed.

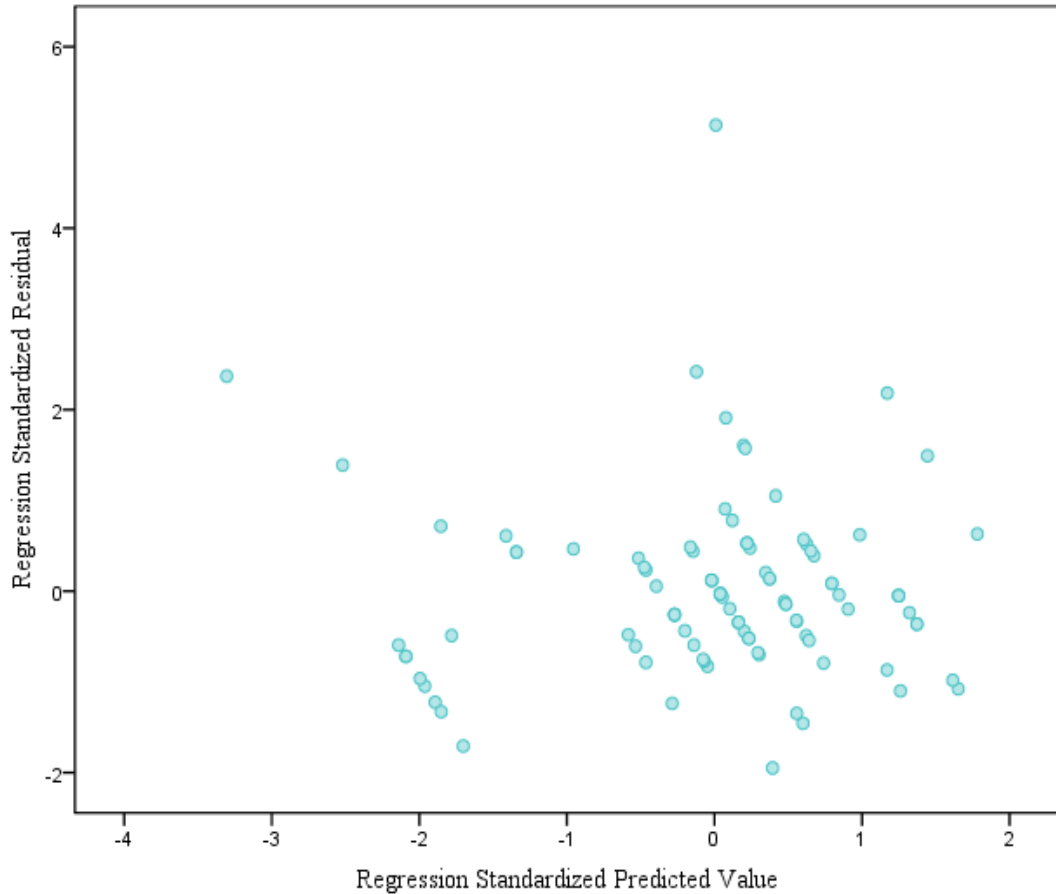


Figure 4.1: Homoscedasticity of the variables

The homoscedasticity graph illustrates the relationship between the predicted values of the dependent variable, project success, and the corresponding standardized residuals. Visually, the scatter plot exhibits a clear positive linear trend, indicating that as the predicted values of project success rise, the standardized residuals also tend to increase systematically. This observation suggests that the variability of the residuals remains constant across the range of predicted values, confirming the presence of homoscedasticity. In simpler terms, the spread of the residuals around the regression line remains consistent, supporting the assumption of constant variance in the error terms.

4.1.7.3 The residuals are normally distributed

Figure 4.2 shows the distribution of the residuals. A lower p-value means that it is less likely that the data is normally distributed. In the graph, the expected cumulative probability of the standardized residuals is plotted against the observed cumulative probability. This details the homoscedasticity of the variables, particularly focusing on the relationship between the predicted values of the dependent variable (project success) and the standardized residuals. It effectively explains that the scatter plot exhibits a positive linear relationship, indicating that as

the predicted values of project success increase, the standardized residuals also tend to increase. This suggests a consistent variability of the residuals across the range of predicted values, confirming homoscedasticity. The explanation is clear and concise, providing a solid understanding of the concept and its implications for regression analysis.

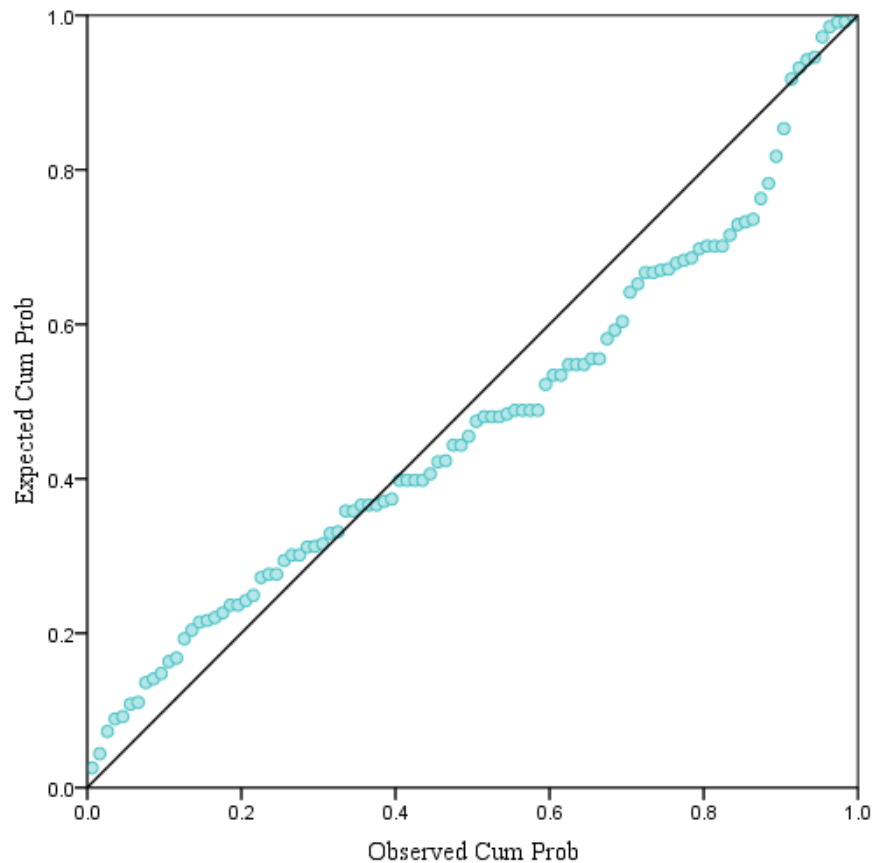


Figure 4.2: Distribution of the Residuals - Normal P-P Plot of Regression Standardized Residual

4.1.7.4 Linear relation between independent and dependent variables

The fitted lines appear in the Figure 4.3, 4.4, 4.5, 4.6, and 4.7 have positive slope, which suggests that there are positive correlations among each two variables. In other words, as supplying resources, establishing structural arrangements, facilitating communication, offering expertise, exercising power increase project success also tends to increase.

The fitted lines depicted in Figure 4.3 exhibit a positive slope, indicating a positive correlation between project success and the allocation of resources. This suggests that as the level of resource provision increases, there is a corresponding uptick in project success rates. Such a relationship underscores the importance of resource allocation in driving project outcomes, implying that a sufficient and efficient allocation of resources can significantly enhance the

likelihood of achieving success in project endeavors. This positive correlation observed in the fitted lines underscores the significance of resource management strategies in facilitating project success and highlights the potential benefits of optimizing resource allocation practices within TMS frameworks.

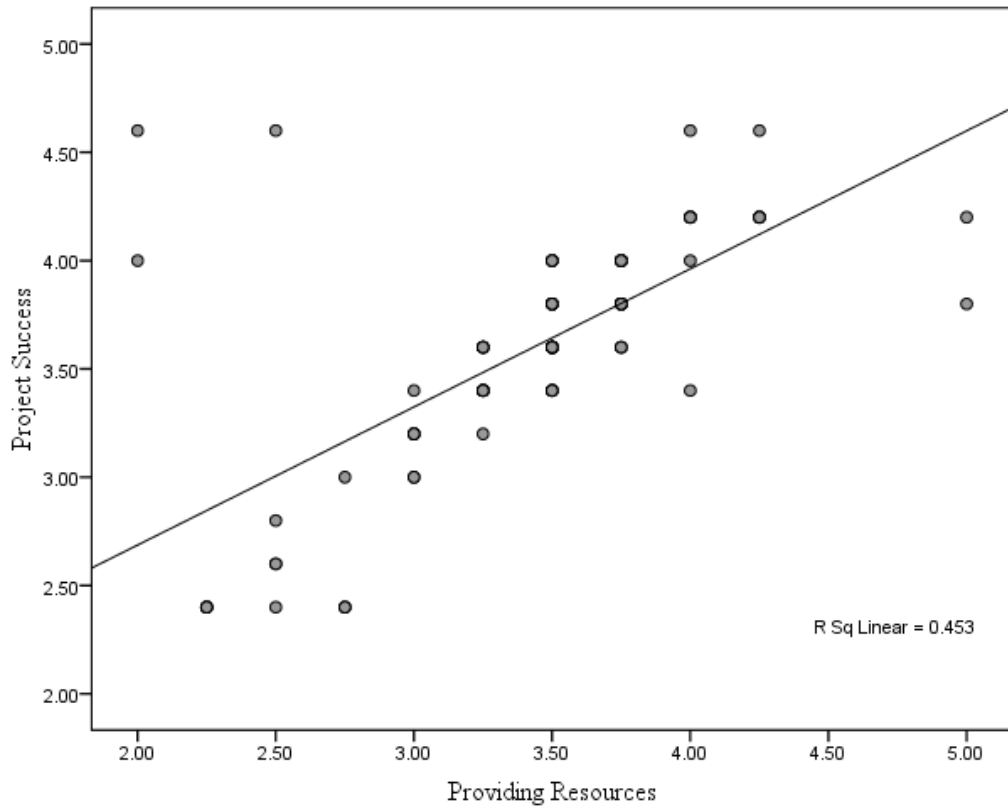


Figure 4.3: Relationship with Project Success and Providing resources

The presence of positively sloped fitted lines in Figure 4.4 indicates a notable correlation between project success and structural arrangements. This suggests that as the effectiveness or efficiency of the structural arrangements increases, there is a corresponding rise in project success rates. This finding underscores the pivotal role that structural arrangements play in influencing project outcomes. It implies that well-designed and robust structural frameworks, including organizational hierarchies, communication channels, and decision-making processes, can significantly contribute to enhancing project success.

This positive correlation underscores the importance of strategic planning and implementation of appropriate structural arrangements within project management frameworks to optimize project performance and achieve desired outcomes efficiently.

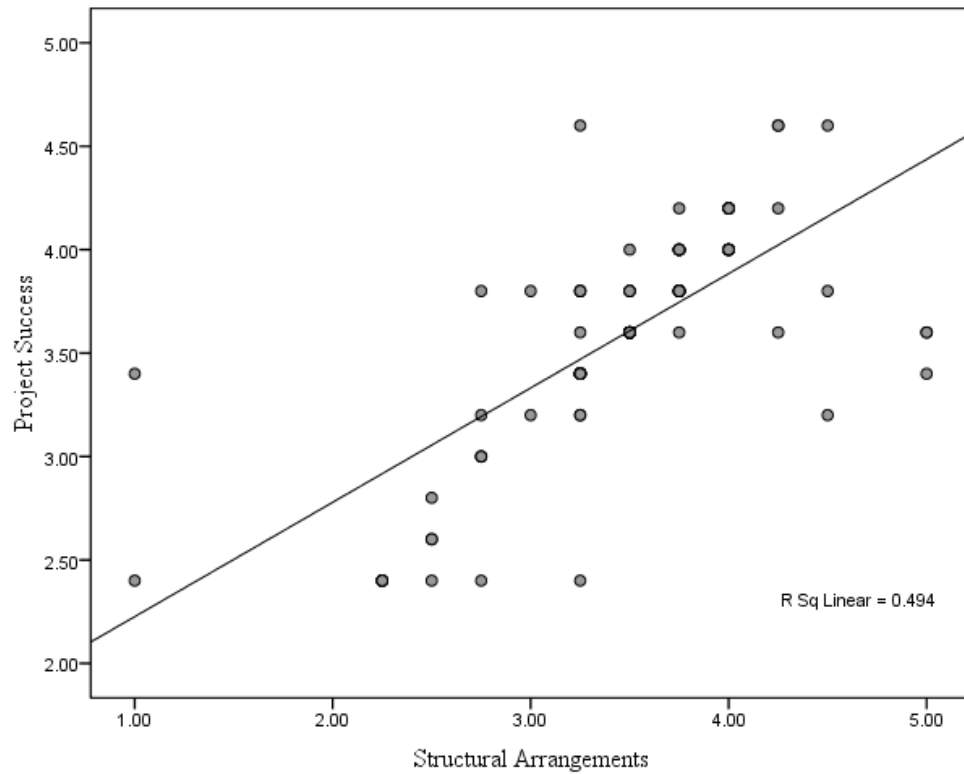


Figure 4.4: Relationship with Project Success and Structural Arrangements

Figure 4.5 implies a discernible correlation between project success and effective communication practices. This observation implies that as the quality and efficiency of communication within the project environment improve, there is a corresponding increase in project success rates. This correlation underscores the critical role that communication plays in facilitating project outcomes. It suggests that clear, timely, and transparent communication among project stakeholders, including team members, managers, clients, and external partners, is essential for achieving project goals and objectives. Effective communication fosters collaboration, alignment of expectations, problem-solving, and decision-making, thereby enhancing overall project performance. This positive correlation highlights the importance of investing in communication strategies, tools, and practices to optimize project success and mitigate risks associated with miscommunication or inadequate information flow.

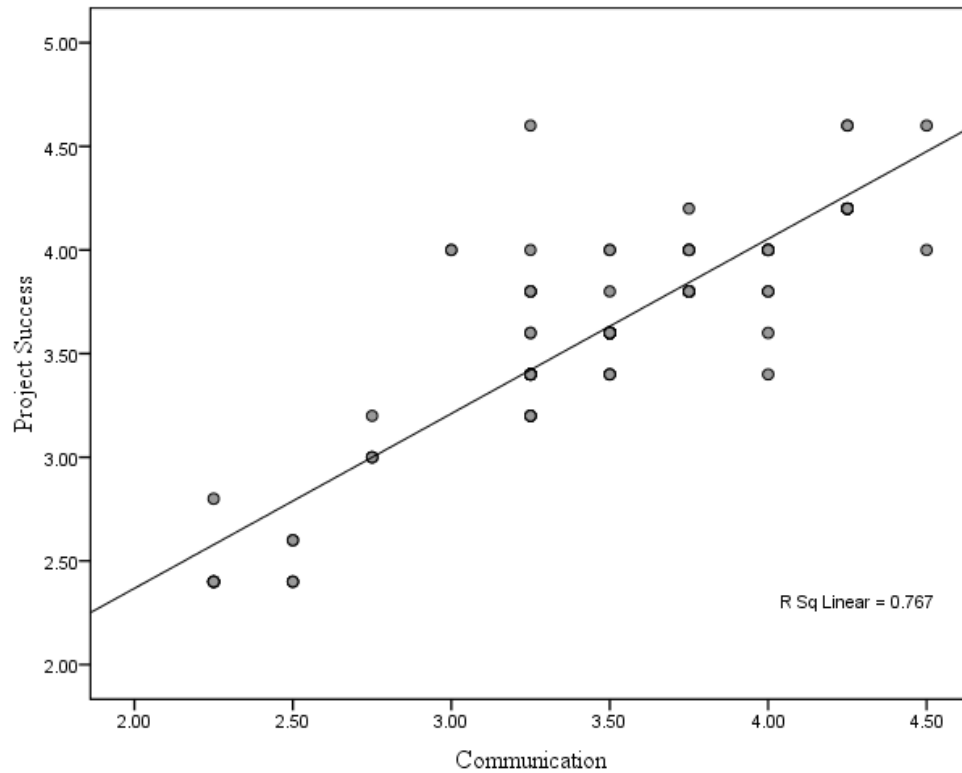


Figure 4.5: Relationship with Project Success and Communication

Figure 4.6 suggests a noteworthy correlation between project success and the level of expertise involved. This observation suggests that as the expertise and competence of individuals or teams engaged in the project increase, there is a corresponding improvement in project success rates. This correlation underscores the pivotal role that expertise plays in influencing project outcomes. It implies that having skilled and knowledgeable professionals who possess the necessary technical know-how, experience, and proficiency in their respective domains can significantly contribute to the success of a project. Expertise enhances problem-solving capabilities, decision-making processes, and overall project performance, ultimately leading to successful project delivery. This positive correlation emphasizes the importance of recruiting, developing, and retaining a highly skilled workforce within TM to maximize project success and achieve desired outcomes effectively.

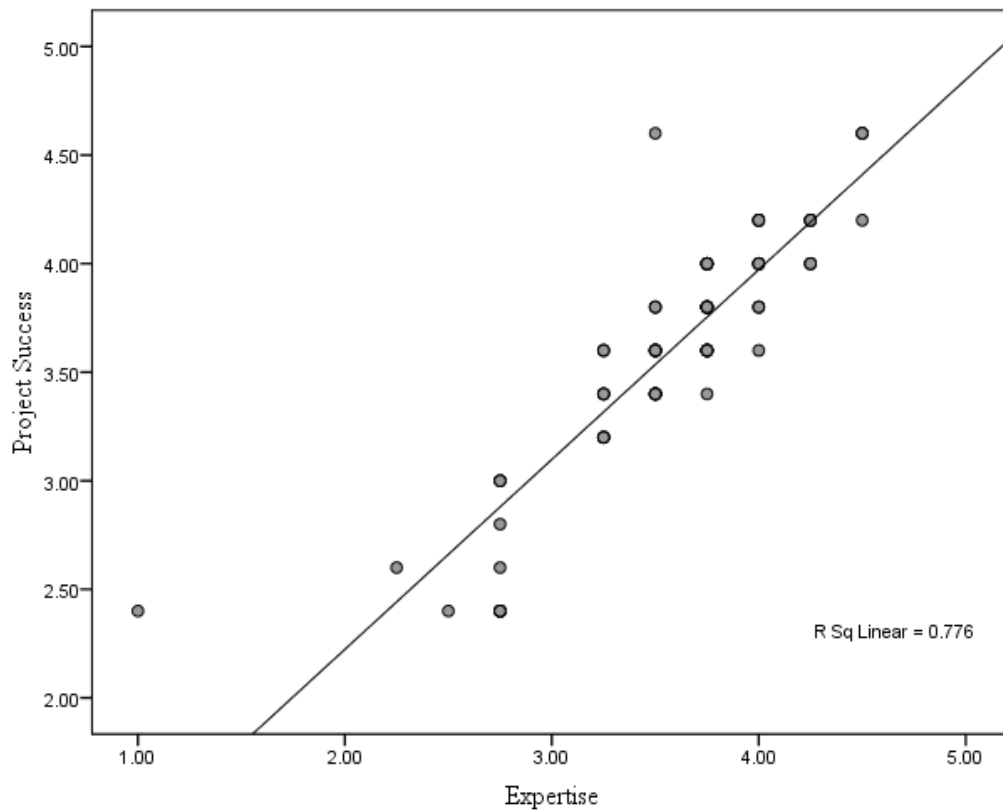


Figure 4.6: Relationship with Project Success and Expertise

Figure 4.7 portrays a compelling correlation between project success and the distribution or exercise of power within the project environment. This observation implies that as the strategic allocation or utilization of power increases, there is a corresponding improvement in project success rates. This correlation underscores the significant impact that power dynamics can have on project outcomes. It suggests that effective management and utilization of power, whether it be positional power held by leaders, expert power wielded by subject matter experts, or relational power derived from interpersonal relationships, can positively influence project performance. Power can facilitate decision-making, resource allocation, conflict resolution, and stakeholder management, thereby enhancing overall project success.

This positive correlation emphasizes the importance of understanding and leveraging power dynamics within project teams and organizations to optimize project outcomes and achieve project goals effectively.

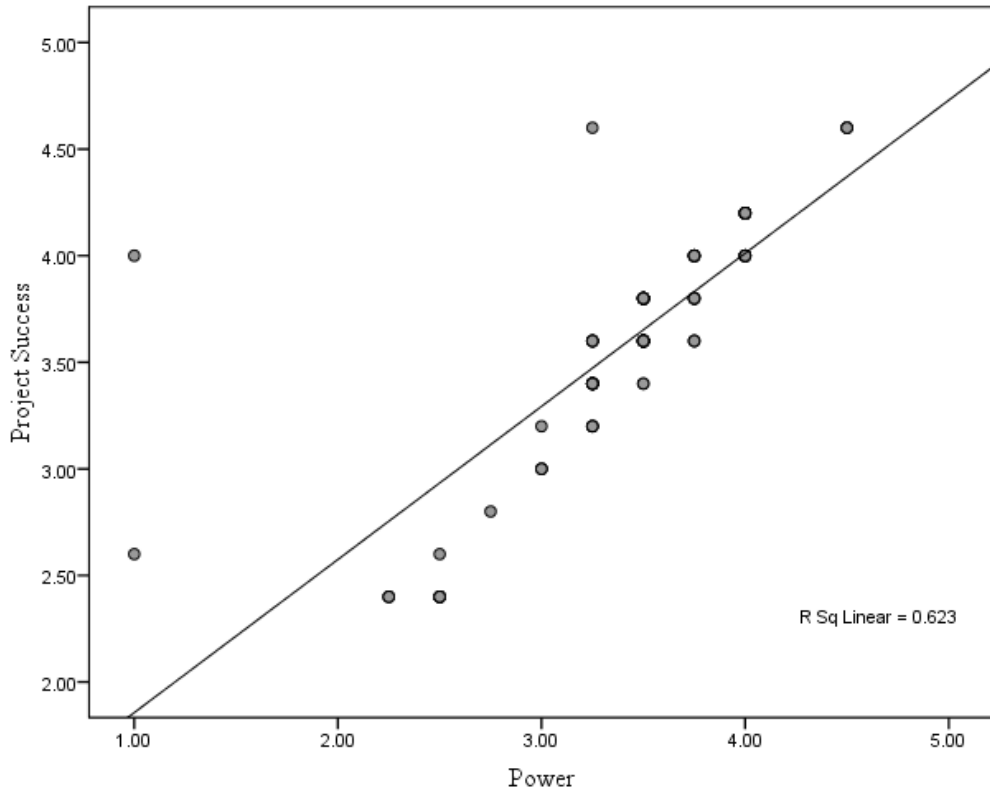


Figure 4.7: Relationship with Project Success and Power

4.1.8 Regression analysis

This section presents the results of the regression analysis.

4.1.8.1 Model Statistics

Table 4.7 shows the model statistics of the regression model.

Table 4.7: Regression Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934 ^a	.872	.865	.19645

a. Predictors: (Constant), Power, Providing Resources, Structural arrangements, Expertise, Communication

b. Dependent Variable: Project Success

The R value, which is the correlation coefficient, is 0.934. This indicates a very strong positive correlation between the combined predictors and the dependent variable. An R value close to 1 suggests that the model explains a large portion of the variance in the dependent variable.

The R² value is 0.872, meaning that approximately 87.2% of the variance in the dependent variable is explained by the model. This is a substantial proportion, indicating that the predictors collectively have a strong explanatory power for the variation in the dependent variable. The Adjusted R² value is 0.865, slightly lower than the R Square, which is common in multiple regression analyses. The adjusted R² is a more precise estimate of the model's explanatory power, as it adjusts for the number of predictors in the model. An Adjusted R² of 0.865 indicates that after accounting for the number of predictors, about 86.5% of the variance in the dependent variable is explained by the model. This is still considered a high level of explanatory power.

The Standard Error of the Estimate is 0.19645, which provides an estimate of the standard deviation of the residuals (the differences between observed and predicted values). A lower standard error indicates a better fit of the model to the data. In this context, the standard error suggests that the predicted values are, on average, approximately 0.196 units away from the actual values, which can be considered a relatively small error, given the context of the data.

The model demonstrates a strong fit with a high R² and Adjusted R², indicating that the selected predictors are very effective in explaining the variance in the dependent variable. The high R value points to a strong correlation between the predictors and the dependent variable. The relatively low standard error of the estimate further confirms the model's accuracy in predicting the dependent variable. The significant coefficients for the predictors in the regression model suggest that these TMS components are important factors influencing project success in Sri Lankan construction projects.

Table 4.8: ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.713	5	4.943	128.067	.000 ^a
	Residual	3.628	94	.039		
	Total	28.340	99			
a. Predictors: (Constant), Power, Providing Resources, Structural arrangements, Expertise, Communication						
b. Dependent Variable: Project Success						

The Table 4.8, indicates that the regression model is statistically significant ($p < .001$), as evidenced by the F-statistic of 128.067. This finding suggests that the independent variables collectively have a significant relationship with the dependent variable (Project success), which represents project success in Sri Lankan construction projects. Therefore, there is a current relationship between project success and the TMS components in Sri Lankan construction projects. The significant regression model indicates that industry practices and operating procedures associated with the TMS components contribute significantly to project success in Sri Lankan construction projects.

4.1.8.2 Regression Coefficients

The Table 4.9 shows the results of the regression analysis.

Table 4.9: Regression results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	1 (Constant)	.084	.144		.580	.564
	Providing Resources	.140	.047	.148	2.992	.004
	Structural arrangements	.099	.040	.126	2.475	.015
	Communication	.263	.075	.274	3.502	.001
	Expertise	.387	.074	.389	5.220	.000
	Power	.117	.056	.129	2.077	.041
a. Dependent Variable: Project Success						

4.1.8.3 Providing Resources

The coefficient for "Providing Resources" is 0.140, suggesting that a one-unit increase in providing resources is associated with a 0.140 unit increase in project success, holding other factors constant. This shows a positive relationship, implying that as the level of providing resources increases, project success tends to increase. The standardized coefficient (Beta) of 0.148 indicates the impact of providing resources on relative importance. Further, the t-value associated with "Providing Resources" is 2.992, and the significance level (p-value) is 0.004. The t-value of 2.992 represents how many standard errors the coefficient is away from zero,

and the low p-value suggests that the predictor is likely contributing significantly to predicting project success. The t-value of 2.992 and the low p-value of 0.004 indicate that the effect of "Providing Resources" on project success is statistically significant.

In summary, based on the analysis, providing resources is a statistically significant predictor of project success. The positive coefficient suggests a positive impact of providing resources on project success, and the statistical significance underscores the reliability of this relationship in the model.

4.1.8.4 Structural arrangements

The coefficient for "Structural Arrangements" is 0.099, indicating that a one-unit increase in structural arrangements is associated with a 0.099 unit increase in project success, holding other factors constant. The standardized coefficient (Beta) of 0.126 provides a standardized measure relative impact. The coefficient for "Structural Arrangements" (0.099) suggests a positive relationship, implying that an increase in structural arrangements is associated with an increase in project success. Further, the t-value associated with "Structural Arrangements" is 2.475, and the significance level (p-value) is 0.015. This indicates that the coefficient for "Structural Arrangements" is statistically significant. The t-value of 2.475 suggests the predictor's significance in predicting project success. The t-value of 2.475 and the p-value of 0.015 indicate that the effect of "Structural Arrangements" on project success is statistically significant.

In summary, based on this analysis, structural arrangements appear to be a statistically significant predictor of project success. The positive coefficient suggests a positive impact of structural arrangements on project success, and the statistical significance reinforces the reliability of this relationship in the given model.

4.1.8.5 Communication

The coefficient for "Communication" is 0.263, indicating that a one-unit increase in communication is associated with a 0.263 unit increase in project success, holding other factors constant. The standardized coefficient (Beta) of 0.274 provides a standardized measure of relative importance. The coefficient for "Communication" (0.263) suggests a positive relationship, implying that an increase in communication is associated with an increase in project success. The t-value associated with "Communication" is 3.502, and the significance level (p-value) is 0.001. This indicates that the coefficient for "Communication" is statistically significant. The t-value of 3.502 suggests the predictor's significance in predicting project success. The t-value of 3.502 and the low p-value of 0.001 indicate that the effect of "Communication" on project success is statistically significant.

In summary, based on this analysis, communication appears to be a highly statistically significant predictor of project success. The positive coefficient suggests a positive impact of effective communication on project success, and the statistical significance reinforces the reliability of this relationship in the given model.

4.1.8.6 Expertise

The coefficient for "Expertise" is 0.387, indicating that a one-unit increase in expertise is associated with a 0.387 unit increase in project success, holding other factors constant. The standardized coefficient (Beta) of 0.389 provides a standardized measure of the relative importance. The coefficient for "Expertise" (0.387) suggests a positive relationship, implying that an increase in expertise is associated with an increase in project success. The t-value associated with "Expertise" is 5.220, and the significance level (p-value) is 0.000. This indicates that the coefficient for "Expertise" is statistically significant. The t-value of 5.220 suggests the predictor's significance in predicting project success. The t-value of 5.220 and the very low p-value of 0.000 indicate that the effect of "Expertise" on project success is highly statistically significant.

In summary, based on this analysis, expertise appears to be a highly statistically significant predictor of project success. The positive coefficient indicates a positive impact of expertise on project success, and the low p-value reinforces the reliability of this relationship in the given model.

4.1.8.7 Power

The coefficient for "Power" is 0.117, indicating that a one-unit increase in power is associated with a 0.117-unit increase in project success, holding other factors constant. The standardized coefficient (Beta) of 0.129 provides a standardized measure of the relative importance. The coefficient for "Power" (0.117) suggests a positive relationship, implying that an increase in power is associated with an increase in project success. The t-value associated with "Power" is 2.077, and the significance level (p-value) is 0.041. This indicates that the coefficient for "Power" is statistically significant. The t-value of 2.077 suggests the predictor's significance in predicting project success. The t-value of 2.077 and the p-value of 0.041 indicate that the effect of "Power" on project success is statistically significant, although the significance level is modestly above the conventional threshold of 0.05.

In summary, based on this analysis, power appears to be a statistically significant predictor of project success, but the significance level is moderately above the conventional threshold. The positive coefficient suggests a positive impact of power on project success, and further

consideration may be needed in the context of the specific study and the desired level of significance.

4.1.8.8 Hypothesis testing

The predictor variables, providing resources, structural arrangements, communication, expertise, and power all exhibit t-values that surpass the threshold for significance. In addition, communication and expertise stand out with t-values of 3.502 and 5.220, respectively, both associated with extremely low p-values (0.001 and 0.000). These results indicate a robust statistical significance, suggesting that effective communication and expertise significantly contribute to higher levels of project success. Further, providing resources, structural arrangements, and power also demonstrate statistically significant t-values (2.992, 2.475, and 2.077, respectively), their p-values of 0.004, 0.015, and 0.041 fall below the conventional 0.05 threshold, reinforcing their importance in the predictive model. Accordingly, the Table 4.10 shows the summary of hypothesis testing.

Table 4.10: Summary of Hypothesis testing

Hypothesis	Detail	Accept/Reject
H1	There is a significant impact of supplying resources by TM on project success	Accept
H2	There is a significant impact of establishing structural arrangements by TM on project success	Accept
H3	There is a significant impact of effective communication of TM on project success	Accept
H4	There is a significant impact of offering knowledge and expertise of TM to project team on project success	Accept
H5	There is a significant impact of exercising power of TM on project success	Accept

In summary, based on the t-values and p-values, "Expertise," "Communication," "Providing Resources," "Structural Arrangements," and "Power" are considered statistically significant predictors of "Project Success," providing valuable insights into the factors influencing project outcomes.

4.1.9 Limitations and challenges encountered by TM when supporting to the projects and practices that used/propose to use to overcome them

Figure 4.8 presents the respondents' feedback regarding the limitations and challenges encountered by the TM when supporting projects. Out of 100 respondents, 86 individuals

provided their insights to identify the constraints and challenges faced by the TM in the context of supporting Sri Lankan construction projects.

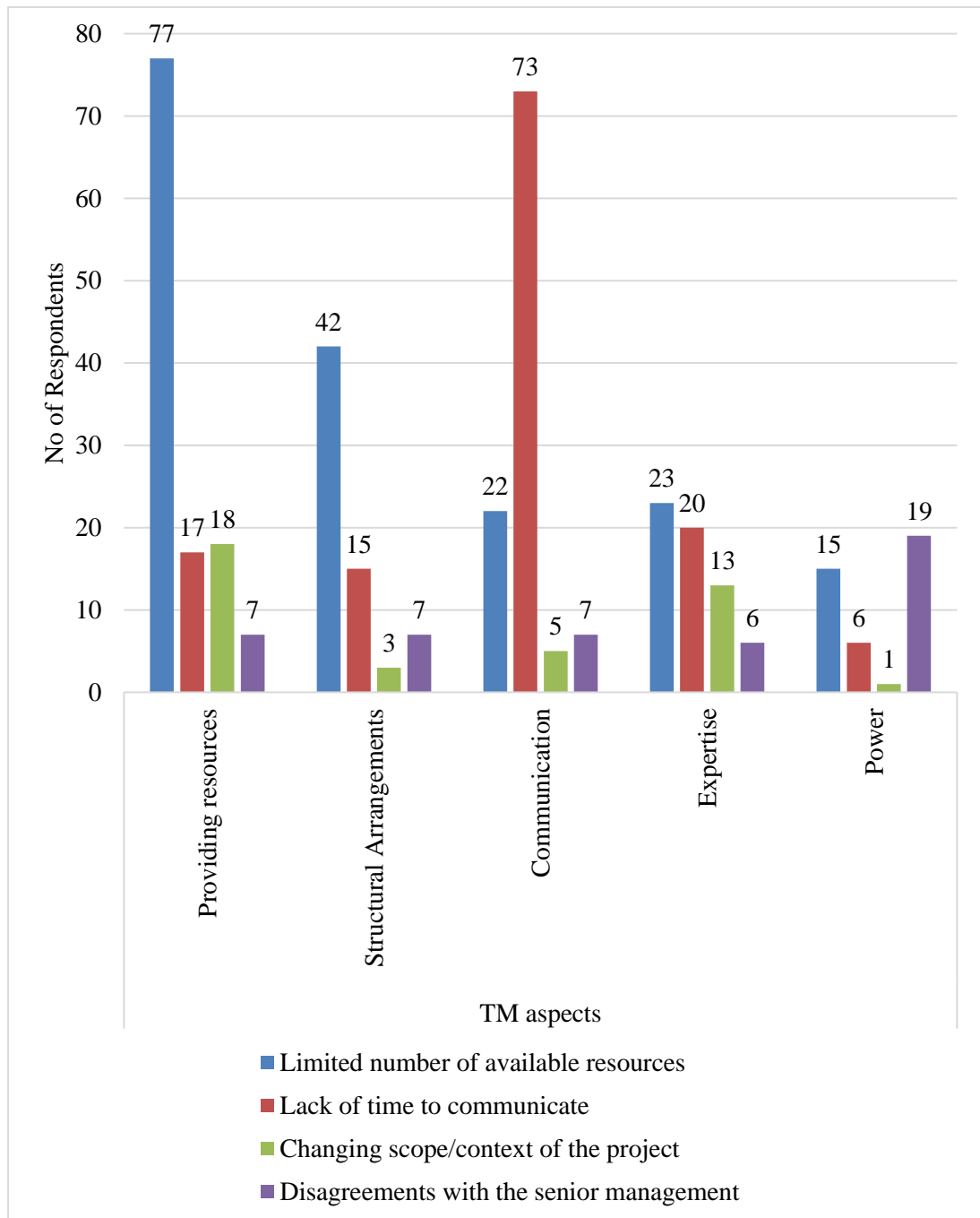


Figure 4.8: Limitations and challenges faced by the TM when supporting the projects

The summary of the respondents' comments on limitation and challenges encountered by the senior management is mentioned Appendix 2. The comments of the respondents on feedback on the practices used or proposed to overcome the limitations and challenges faced by TM is mentioned Appendix 3.

The Table 4.11 presents the summary of respondents' feedback on the practices used or proposed to overcome the limitations and challenges faced by TM. Out of 100 respondents, 20 individuals shared their insights regarding these practices.

Table 4.11: Practices that used/propose to use to overcome the limitations and challenges that TM faced

Practices that used/propose to use to overcome the limitations and challenges that TM faced	Frequency Mentioned
Frequent meetings/ team building sessions/ Training programs	4
Effective communication among stakeholders / Transparent communication / development of proper communication channel	5
MS project/ Primavera/ standard project management / ERP software usage	9
Collaborative approach with industry/ Training programs and collaboration with other similar companies	4
Delegating the authorities to different level as appropriate	2
Propose to archive the lessons learnt from previous projects effectively and change the organizational structures/ procedures/ processes with respect to each project and sharing the knowledge among the team	3

4.1.10 Key findings

In the Sri Lankan construction field, project success is positively associated with the all five aspects of the TMS, namely supplying resources, establishing structural arrangements, facilitating communication, offering and exhibiting expertise, and exercising power.

According to the findings, expertise and communication emerge as the most significant aspects of TMS. They are followed by providing resources, structural arrangements, and power, which are considered statistically significant predictors for project success. These results provide valuable insights into the factors influencing project outcomes.

In addition, time limitation for effective communication, limited resources, disagreements with TM and project team, scope changes in implementation stage, lack of expertise knowledge in field, and less mutual understanding among TM and project staff are identified as highly significant challenges and limitations of the TM.

Accordingly, key findings include reliance on strategic planning and risk management for resource-related issues, adoption of modern communication technologies to address communication barriers, and usage of advance project management systems, fostering a culture of empowerment and autonomy to manage power dynamics, and investing in leadership training. Additionally, emphasis is placed on industrial collaboration and knowledge sharing to enhance expertise in the field.

4.2 Discussion on findings

The demographic information collected from the survey participants reveals a diverse representation within the construction industry. Professionals from various roles, such as engineers, PMs, consultants, and senior management positions, have participated in the study. The sample population exhibited a range of educational backgrounds, professional qualifications, and levels of experience, reflecting the multidimensional nature of the construction sector. In addition, the findings are based vast array of organizations and project scenarios in the industry. The analysis revealed trends and patterns in the data, shedding light on the factors that drive successful project outcomes in the construction industry. It highlighted the importance of senior management support in various dimensions, showcasing its influence on project success.

4.2.1 TMS vs Project success

TMS was measured using five variables: resource provisions, structural arrangements, communication, TM's knowledge and competencies and power.

The descriptive statistics provide valuable insights into the variables under consideration. The moderate project success, as indicated by a mean score of 3.586, suggests a nuanced scenario in Sri Lankan construction projects. The TMS components exhibit moderate to high levels of effectiveness, with mean scores ranging from 3.4075 to 3.5575. These scores offer a snapshot of the prevalent industry practices and operating procedures in the Sri Lankan construction context related to TMS. The skewness and kurtosis statistics offer additional depth, revealing distribution characteristics. Negative skewness values for some variables, such as Expertise and Power, suggest potential challenges perceived more severely by TMs. Positive kurtosis values, especially for Structural Arrangements, hint at specific challenges being more peaked in distribution. Overall, the findings suggest a moderate to high level of TMS effectiveness, with distinct nuances across various components.

Further, the correlation analysis reveals significant positive correlations between project success and all TMS components. These moderate to strong correlations (0.673 to 0.881) indicate that

a stronger TMS is associated with higher project success. The positive correlations suggest that industry practices and procedures linked to TMS components contribute favorably to project success in Sri Lankan construction projects. Strengthening TMS effectiveness may be instrumental in overcoming challenges faced by TMs in the industry.

In addition, the regression model demonstrates a strong fit, explaining a substantial portion (87.2%) of the variance in project success. The adjusted R^2 (0.865) accounts for the number of predictors, indicating a high level of explanatory power. The low standard error of the estimate reinforces the model's accuracy in predicting project success.

Furthermore, the statistically significant regression model ($p < .001$) suggests a significant relationship between TMS components and project success in Sri Lankan construction projects. This underscores the current association between project success and TMS components. All regression coefficients for TMS components are positive, signifying their positive influence on project success. The standardized coefficients (Beta values) allow for a comparison of their relative importance.

According to the regression results, the t-value of 5.220 and the very low p-value of 0.000 indicate that the effect of "Expertise" on project success is highly statistically significant. Accordingly, TM expertise shows the highest impact, followed by communication, providing resources, structural arrangements, and power in the Sri Lankan construction projects.

The coefficients represent the relationship between each TMS component and the dependent project success. The standardized coefficients indicate the strength and direction of the relationship after controlling for the scales of the variables. All TMS measures have positive standardized coefficients. This suggests that an increase in each TMS component is associated with an increase in project success. In summary, each predictor has a statistically significant impact on project success. The standardized coefficients (Beta values) provide a way to compare the relative importance of each predictor, considering their different scales. Expertise appears to have the highest impact, followed by communication, providing resources, power, and structural arrangements.

Hence, the practices that TM use for the support project success which are related to expertise is more important and the followed by communication, providing resources, structural arrangements, and power aspects respectively. Providing resources, power, and structural arrangements also contribute positively to project success, though with varying degrees of significance. These aspects, while impactful, are comparatively less influential than expertise and communication as per the findings.

Overall, the findings suggest a positive relationship between project success and the TMS components in Sri Lankan construction projects. The coefficients provide insights into the importance of each TMS component as an industry practice or operating procedure in Sri Lankan construction projects.

4.2.2 Validation of findings of regression analysis

4.2.2.1 Connection between senior management support and success of projects

In validating the findings of this study, it is crucial to consider insights from existing research studies within the realm of construction management. Numerous studies have explored the relationship between TMS and project success, emphasizing the significance of factors such as supplying resources, establishing structural arrangements, facilitating communication, offering and exhibiting proficiency, and exercising authority.

Ahmed et al. (2014) and Ahmed and Mohamad (2016)'s works support the observed positive correlation between expertise of TM, resource provisions, organizational arrangements, exercising of authority, power, and effective communication and project success, emphasizing the importance of specialized knowledge in construction projects.

Researches by Young and Jordan (2008) and Boonstra, (2013) have consistently highlighted the positive impact of effective TMS on project success. The findings align with established literature emphasizing the role of clear and transparent communication channels and proficiency and knowledge sharing and adapting the new technological trends in enhancing project outcomes by Boonstra (2013). Furthermore, Boonstra (2013)'s research contributes to the validation of this study's results by emphasizing the critical role of providing resources in project success. Limited resources have been identified as one of key challenge in TM, and existing literature underscores the need for adequate resources to provide TMS for successful project completion.

Additionally, Fareed and Su (2022) found that TMS has the potential to enhance the connection between Project Governance (PG) and Project Performance (PP) by proficiently supplying and overseeing resources, cultivating a conducive work environment, aligning project goals with organizational objectives, empowering through authority delegation, and maintaining effective communication with stakeholders.

4.2.2.2 Resource Provisions and Project Success

The study investigates the link between resource allocations and project success within the framework of extensive scholarly research that analyses many aspects impacting project results.

Belout and Gauvreau (2004) stress the significance of human resource management in achieving project success, emphasizing the need to efficiently handle both the personnel and material resources involved in a project. This is consistent with the results of this research, which indicate that the availability of sufficient financial, physical, and human resources is essential for the success of a project.

Koelmans (2004) and Albert, Balve, and Spang, 2017 examine the concept of project success and performance assessment, highlighting the need of adopting a complete methodology to evaluate project results. The study's results demonstrate the multifaceted character of project success, as suggested by Shenhar et al. (2001), where various components of resource provisioning contribute to project success to varying degrees.

The study's results enhance the current body of knowledge by emphasizing the intricate and diverse characteristics of resource allocations in project management by TM. The findings indicate that resource provisioning play a crucial role in project performance.

4.2.2.3 Structural Arrangements and Project Success

The outcomes of this research suggest that the impact of structural arrangements on project success can be understood within the wider academic discussion on project management. The modest levels of sufficiency in project structure design, appropriateness of structures, and strengthening of stakeholder support, together with the substantial variability in these factors, emphasize the intricate nature of structural arrangements in impacting project results.

Raziq, Ahmad, Iqbal, Ikramaullah, and David, 2020 investigate how knowledge sharing influences the connection between organizational structure and project success. Their results indicate that the efficacy of structural arrangements may be contingent upon the extent to which information is disseminated across the project team, a variable that might account for the observed collection in this research.

In addition, these findings are aligned with results of best practices to follow for TMS by Zwikael (2008) such as establishing clear metrics and criteria for measuring project success, helping to evaluate project performance against predefined benchmarks and dedicated project office/PMO to oversee, organizational structure that provides adequate support for project teams, facilitating collaboration and success, and support project-related activities.

Belout and Gauvreau (2004) examine the influence of human resource management on the achievement of projects, emphasizing the significance of efficiently managing both human and structural resources. The viewpoint mentioned here is pertinent to the results of the research,

which highlight the importance of well-designed structural arrangements as a crucial determinant in the success of a project.

The study's results on the organization of resources and the achievement of project objectives enhance the current body of knowledge by emphasizing the significance of efficient planning, stakeholder engagement, and the harmonization of structural and human resource management in project success. The diversity noticed in these elements emphasizes the need for customized strategies in structural arrangements in various project settings.

4.2.2.4 Communication and Project Success

The study's results emphasize the importance of communication in achieving project success, which is consistent with known academic viewpoints that stress the crucial function of good communication in project success.

These findings are aligned with results of best practices to follow for TMS by Zwikael (2008) that to keep project management teams updated on the latest methodologies and best practices. Also, he highlighted the exploration and adoption of innovative tools and techniques to enhance project management practices.

Culo and Skendrovic (2010) underscore the significance of communication management, as shown by the high average scores for regular communication and communication of possible changes of projects. This is consistent with the results of the research, which demonstrate that excellent communication has a significant beneficial influence on the success of a project.

Camilleri (2016) examines key characteristics and behaviors that are crucial for achieving project success, with a particular emphasis on communication. The study's results on many facets of communication, such as clarity, frequency, and efficacy in improving organizational productivity, are consistent with Camilleri's focus on communication as a key determinant of success.

Therefore, the study's results on communication and project performance enhance the current body of knowledge by emphasizing the complex and diverse aspects of communication in TM and also strong relationship with project success. The regression findings clearly demonstrate the substantial influence of communication on project success, emphasizing the need of implementing effective communication techniques to guarantee favorable project outcomes.

4.2.2.5 TM's Expertise and Project Success

The study's results on several facets of TM expertise and their high influence on project performance align with current academic research, highlighting the complex nature of knowledge in project management.

Boonstra (2007)'s study highlighted that TM's knowledge is crucial for the performance of the project.

Also, Zwakiel (2008) highlighted best practices in TMS for knowledge sharing and staying updated on new technological trends. These practices include fostering collaborative and interactive groups involving different departments to enhance coordination and synergy in project activities, as well as the utilization of organizational project data warehouses.

Raziq et al., (2020) investigated how knowledge sharing influences the connection between organizational structure and project success. Their results show the knowledge sharing and collaborative approaches are more beneficial in project success.

The results of Shenhar et al. (2007) highlight the significance of technological flexibility in project management, reflecting the modest degree of knowledge in new technologies and its extensive variability. Tidd and Bessant (2018) emphasize the need of ongoing learning and adjustment to emerging technologies, which is essential for sustaining competitiveness and achieving success in projects.

The regression findings highlight the strong and beneficial influence of the TM's expertise on project success. This emphasizes how the many areas of knowledge within the TM together contribute to accomplish project objectives.

4.2.2.6 Power and Project Success

The study's results provide unique insights into the relationship between power and project success, particularly when compared to existing academic research. The study's findings suggest that there is a modest degree of exercising of authority available to help the project team.

These findings align with the best practices for TMS outlined by Zwikael (2008), as presented in Table 2.2. These practices include the adoption and utilization of standardized project management software tools to enhance efficiency and consistency in managing projects, as well as the establishment of a dedicated project office/PMO to oversee and support project-related activities which show the effective usage of authority on project performance.

The study's findings support the view that having a reasonable amount of power in enabling processes is crucial, aligning with the arguments made by PMBOK (2015) about the significance of procedural governance in project management. The considerable fluctuation in this capability, as shown by Shenhar et al. (2007), may indicate the wide range of projects and the differing levels of procedural oversight needed.

In addition, the study's results about the moderate amount of authority in determining roles align with Pinto (2014)'s viewpoint, which emphasizes the need of clearly defining roles for project success.

The regression results demonstrate a modest positive relationship between power and project success. This discovery aligns the conventional perspective, as advocated by writers such as Shenhar et al. (2007), that power and authority contribute to project success.

Hence, the study's analysis of the several facets of power in project management by TM and their influence on project success presents an intricate portrayal.

In conclusion, the findings of this study gain validation from existing research in construction management, reinforcing the importance of effective communication, TMs knowledge and competencies, resource provision, usage of authority, and collaborative strategies usage in achieving project success. The alignment with established literature enhances the credibility and generalizability of the study's outcomes within the broader context of construction project management.

4.2.3 Limitations and challenges encountered by TM and practices to overcome them

The limitations faced by TM in the context of supplying resources, establishing structural arrangements, facilitating communication, offering and exhibiting expertise, and exercising power exhibit diverse challenges. Firstly, a significant constraint revolves around the limited availability of resources, affecting multiple aspects of TM responsibilities, with a substantial impact on providing resources and structural arrangements. Time constraints to communicate pose another challenge, particularly in the realm of communication of TM, where many respondents express difficulty due to a lack of time. Changing scopes or contexts within projects present a multifaceted challenge, affecting the provision of resources, structural arrangements, communication, and TM expertise. Disagreements with senior management emerge as a notable limitation across various TM aspects, especially influencing power-related decisions. These findings underscore the intricate and interconnected nature of challenges faced by TM in construction projects, emphasizing the need for nuanced strategies tailored to specific aspects of TMS to enhance overall project success. Addressing these limitations requires a

comprehensive understanding of their impact on each aspect of TM responsibilities and a targeted approach for effective project management in the construction industry.

This study's findings are aligned with Boonstra's (2013) results on limitations of TM. Additionally, Serrador et al. (2018) emphasize the significance of establishing a favorable environment for project success, which includes proficient communication and backing from stakeholders.

Moreover, some respondents have stated their experienced limitations and challenges to provide valuable insights into the complex landscape faced by TMs. As per the results, doubt/suspiciousness, lack of knowledge on new procedures/technologies, unawareness of project severity/duties, and poor interpersonal skills also emerge as significant concerns. Addressing these challenges is crucial for fostering effective TM in supporting projects.

Furthermore, respondents have proposed practices to overcome limitations and challenges, including frequent meetings/team-building sessions, effective communication, usage of project management software, collaborative approaches, delegating authorities, and archiving lessons learned. These practices offer potential avenues for enhancing TM effectiveness in Sri Lankan construction projects. These findings are aligned with the results of best practices to follow for TMS by Zwikael (2008), Tidd and Bessant (2018), and Raziq et al., (2020).

4.2.4 Chapter Summary

This chapter precisely examines the collected data pertinent to construction project management aspects of project success and TMS. It commences with an introduction, outlining the analytical approach, followed by a detailed of descriptive statistics. The chapter presents a summary of various aspects, including respondent's background, organizational details, details of project that referred to the study and descriptive statistics of the other variables. The chapter also explores into correlation and regression analysis, revealing the relationship and impact of factors such as, supplying resources, establishing structural arrangements, facilitating communication, offering and exhibiting expertise, and exercising power on project success. In addition, this chapter includes a summary limitation and challenges of TM encountered and practices that used to overcome the limitations and challenges. This analytical approach provides profound insights into the dynamics of TM, highlighting the significant factors that influence project outcome. Furthermore, it discusses the study's findings in-depth, validating them with support from previous research.

5 CONCLUSION AND RECOMMENDATIONS

The survey data and analysis show of a well-educated and professionally qualified sample within the construction and project management fields in Sri Lankan Construction Industry. The major positions held by respondents, such as Project Engineers/Resident Engineers and Project Directors/Managers/Senior PMs, highlight the wealth of experience present in the study. The diversity of projects, spanning various organizational categories and budget ranges, adds depth to the findings. Furthermore, the emphasis on organizations with C1 and above grades in CIDA underscores the significance of the study's insights within the broader context of the construction industry. Overall, the findings of the study provide valuable perspectives that contribute significantly to our understanding of TM in the construction sector.

5.1 Conclusion

In conclusion, this study investigates deeply into the dynamics of TMS and its impact on project success in Sri Lanka's construction industry. Employing a comprehensive methodology involving extensive literature review, questionnaire development, data collection, and advanced analysis techniques such as correlation and regression, the study sheds light on the association between TMS and project success, effective TMS practices, and challenges faced by higher-level professionals in the Sri Lankan construction sector.

The findings underscore the critical role of TMS in driving project success in Sri Lankan construction projects. The analysis reveals a strong positive correlation between project success and components of TMS, including resource provision, structural arrangements, communication, expertise, and power. Regression analysis further confirms this relationship, with TMS components collectively explaining a substantial portion of project success variance. Particularly, expertise and communication emerge as significant predictors of project success, highlighting the importance of exercising specialized knowledge and effective communication channels.

The research yields enlightening insights into the influence of TMS on project performance in Sri Lanka's construction sector, demonstrating its significance through indicators such as expertise, effective communication, resource allocation, structural arrangements, and power usage. Proficiency in TM, especially in construction project management and emerging technologies, emerges as a fundamental element for success. Proficiency and practicing expertise of TM and effective communication within TMs, project teams, and external stakeholders significantly impacts project results, emphasizing its importance in project advancement.

The study thoroughly explored the connection between various aspects of TMS and the successful completion of construction projects in Sri Lanka. By conducting precise analysis, it provided a comprehensive understanding of the complex relationship between project success and TMS. The analysis revealed significant associations and impacts of key variables such as resource provision, structural arrangements, communication, expertise, and power.

Also, the study effectively identified the prevailing practices and procedures of TMS in Sri Lanka's construction projects. Through comprehensive data analysis, it revealed that TM primarily focuses on knowledge, proficiency, and experiences, followed by communication, resource allocation, organizational adjustments, and power dynamics. These practices align with global standards but also exhibit unique adaptations to the local context of Sri Lanka.

Moreover, the study successfully uncovered the constraints and hurdles faced by TM in their support roles. The study identified critical challenges such as resource constraints, communication barriers, lack of competencies and skills, less mutual understanding, and power imbalances within project teams and at senior levels. It highlighted the significance of addressing these challenges to enhance project success.

Lastly, the study successfully identified strategies to employ by TM to navigate challenges. These include adopting modern communication technologies, fostering a culture of openness and inclusivity, investing in leadership training, archiving lessons learnt for future, enhancing expertise through industrial collaboration and knowledge sharing. These practices reflect a forward-thinking approach and ensure the long-term success of construction projects in Sri Lanka.

Overall, the research demonstrates that TMS is crucial for project success in the construction sector. The dedication of senior management to allocating sufficient resources, promoting efficient communication, enhancing TM proficiency and using them for project success, and maintaining a harmonious distribution of authority and using power to support the projects are vital for attaining project goals. These findings not only enhance the understanding of TMS but also have practical implications for TM in the construction sector, specifically in Sri Lanka.

In conclusion, the outcomes of this project report provide valuable insights into project success dynamics and senior management support within the construction industry. By identifying effective TMS practices and addressing challenges faced by TM, the study offers valuable guidance for industry professionals, policymakers, and researchers aiming to improve project outcomes in the Sri Lankan construction sector.

5.2 Recommendations

Based on the findings of this study, the following recommendations are made to TM of organizations, practitioners, policy makers, legislators of companies, and scholars:

It's essential for TM to make sure project teams have enough funds, equipment, and people. This means not just giving them funds but also making sure they can easily get the things they need and have skilled staff. Also, using good suitable project management systems, ERP systems, as highlighted by the Nguyen and Hadikusumo (2017), can help manage resources better and make projects more successful.

In addition, TM should focus on making project structures better to ensure project success. This means regularly checking and changing how the organization is set up to match what the project needs. According to Dvir et al., (2003), having flexible and effective project structures is really important. Also, following stronger procedures to involve and work with stakeholders, as suggested by Davis (2014), can boost support and cooperation, making the project more successful overall.

Further, effective communication is really important for a project to succeed. However, using modern communication technology can make sharing information more effective. Also, following a culture that encourages openness and acceptance, as recommended by Cervone (2014), might make communication more efficient, especially in teams with people from different backgrounds.

In addition, senior executives should prioritize the ongoing enhancement of skills in project management, the detection of changes, the use of new technology, and new trends. According to Klunder, Karras, Casselt, Kortum and Schneider, 2017, promoting information sharing and cooperation may harness the aggregate expertise of a group.

Effective usage of authority towards project performance is essential. Zwakiel (2008) propose delegating relevant authority and exhibiting the power in various situations is crucial project success.

In order to address the limitations and challenges, including resource constraints and communication barriers, through strategic measures like investing in competencies and skills development and adopting modern communication technologies will result in more resilient and successful project outcomes. Further, it is vital to have continuous training and skill enhancement for professionals, effective communication within teams and with stakeholders,

and optimized resource allocation through technology integration are key elements that can contribute to improved project management.

And, it is recommended to TMs to have collaboration and knowledge sharing within the industry which will not only enhance expertise but also contribute to staying informed about emerging trends, fostering a forward-thinking approach.

In addition, it is recommended to adopt the innovative problem-solving techniques among TMs to address and overcome challenges effectively. Also, a collaborative approach between TMs and project teams to jointly address challenges and work towards project success and establishment of a robust feedback mechanisms to continuously monitor and improve TMS practices are other ways to overcome the challenges of the TM.

In summary, the adoption of these recommendations has the potential to transform TM practices in the construction industry in Sri Lanka, making them more efficient, collaborative, and successful. This proactive approach to addressing challenges and leveraging opportunities aligns with the industry's evolution and growth, ensuring a positive impact on project outcomes and overall industry sustainability.

5.3 Limitations of Study

In addition, the chapter clearly recognizes the inherent restrictions of the investigation, offering a clear summary of such limits and their consequences for the research outcomes.

While this research provides valuable insights into the influence of TMS on project performance in the Sri Lankan construction sector, it has several limitations that warrant acknowledgment. Recognizing these limitations not only provides contextual information for the study's results but also guides future research in this field.

The research is specifically focused on the construction sector in Sri Lanka, imposing a geographical limitation. While this focus allows for a thorough examination of specific circumstances, it may restrict the applicability of the results to other regions or countries. The techniques, challenges, and managerial responsibilities in the construction industry can vary significantly depending on cultural and economic contexts (Serrador et al., 2018).

The study's limitations may also be influenced by the sample size and participant selection technique. Reliance on convenience sampling or a small sample size could compromise the representativeness of the results and their generalizability to the broader sector.

While questionnaire surveys are efficient, they may introduce response bias or limit the depth of insights obtained. Respondents might exhibit social desirability bias by providing socially acceptable responses or may not fully elaborate on their experiences and perspectives. Integrating qualitative methodologies, such as interviews or case studies, could yield deeper, more nuanced data and a comprehensive understanding of the relationships between TMS and project success.

The cross-sectional approach of this research offers a snapshot of the correlation between TMS and project accomplishment at a specific moment in time. However, this approach overlooks the changes and advancements that may occur over the course of a project or within the industry over time. Longitudinal studies have the potential to provide valuable insights into the progression of this relationship and the impact of external events, such as economic fluctuations or regulatory changes, on project success.

5.4 Future Directions

Promising avenues for future research in the construction sector, particularly in environments similar to Sri Lanka, involve investigating into the correlation between TMS and project performance. Given the dynamic nature of the construction industry and the increasing significance of TM, continuous research, investigation, and adaptation are imperative.

It is recommended that future research expand its geographical scope to improve the generalizability of findings. This expansion should encompass multiple countries or regions, facilitating an examination of how cultural, regulatory, and economic differences influence the implementation and effectiveness of TMS in construction projects.

Subsequent investigations of TMS on project performance could employ a larger and more diverse sample, potentially utilizing stratified or random selection methods to ensure a more comprehensive representation of various sectors and firm sizes within the industry.

Conducting longitudinal studies to track the success of construction projects over an extended period with TMS could provide a more profound understanding of the factors influencing project outcomes. This approach would enable researchers to evaluate the long-term impact of TMS practices on project success and organizational performance.

Moreover, future research could concentrate on integrating sustainable practices into project management in the construction sector. Exploring how TMS contributes to sustainable construction practices, including environmentally friendly initiatives and socially responsible approaches, could constitute a crucial area of investigation.

Lastly, incorporating qualitative research methods, such as in-depth interviews and case studies, is recommended for future studies. This approach would provide a deep exploration of the experiences, perspectives, and challenges encountered by construction professionals in implementing TMS.

By addressing these future research directions, scholars and practitioners can contribute to advancing knowledge in construction project management, fostering innovation, and promoting sustainable TM practices within the construction industry.

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APPENDIX – 1: SURVEY QUESTIONNAIRE

Assessment on the top management support for the construction projects in Sri Lanka

Dear Sir/ Madam

I am a Post Graduate student at the Department of Civil Engineering, University of Moratuwa. As a partial fulfillment to the M.Sc. in Construction Project Management, I need to carry out a research project in this study area.

Research Title: Assessment on the top management support for the construction projects in Sri Lanka

I am pleased to inform you that you have been selected to part of this survey and kindly request your fullest participation and cooperation throughout the same. I would be grateful if you could spend your valuable time to answer all the questions in this questionnaire, as directed.

This questionnaire will be used for academic purposes only. It is designed as a tool for collecting primary data for the research. I assure you that this information will be kept confidential and only the summarized results will be provided in the report and therefore no specific reference will be made to experts who take part in this survey.

Thank you.

Yours faithfully,

Eng. S.N. Priyadarshani (T.P.: 0711217277)

M.Sc. Candidate

PART 1: General Information (Responded Background)

1.1 Education Level * Check all that apply

Diploma related to construction field	
Bachelor's degree related to construction	
Related Master's degree	
Related PhD	

1.2 Other relevant professional qualifications

Check all that apply

Chartered Engineer, IESL	
International Professional Engineer	
PMP qualified	
Chartered Quantity Surveyor	

1.3 Position * Mark only one oval.

Project Engineer/ Resident Engineer	
Design/ Senior Design Engineer	
Project Manager/ Project Director / Senior Project Manager	
Director/ Managing Director / General Manager /Chief Executive officer	

1.4 Experience in Construction industry (No. of Years) * Mark only one oval.

Less than 5 years	
5 - 10 Years	
11 - 15 Years	
16 - 25 Years	
More than 25 Years	

1.5 Type and role of the Organization* Mark only one oval.

Private construction company	
Private consultancy company	
Design firm	
Government organization	
Semi- Government organization	

1.6 Specialized Grade of the organization in CIDA * Mark only one oval.

C1 and above	
C4 - C2	
Below C4	
Other	

PART 2: Assessment on Project Success

Please refer to a particular project of your company which was already completed to answer this section. This section is to assess the project success measures of a particular project in different aspects such as project efficiency, customer/client/employers' satisfaction, impact on the team, business and direct organizational success and preparation for the future.

Please use 1-5 Likert-scale for indicating your opinion on the questions no.2.5 to 2.9.

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree

2.1 Type of the project * Mark only one oval.

Buildings / apartments	
Bridges / viaduct	
Rural roads	
National Highways / Expressways	
Water supply and sewerage system	
Irrigation system and drainage canals	
Other	

2.2 The total budget of the project * Mark only one oval.

Below Rs. 200 Mn	
Rs. 200 Mn - 500 Mn	
Rs. 500 Mn - 1000 Mn	
Over Rs. 1000 Mn	

2.3 Project Duration * Mark only one oval.

Less than 1 Year	
1 - 2 Year	
2 - 5 Years	
More than 5 Years	

2.4 This question is to assess 'Project Efficiency'. Please select an answer by selecting an option as appropriate. * Mark only one oval per row.

Description	1	2	3	4	5
The required quality was achieved					
The had only minor scope changes from the specified scope					
Project was completed on time or earlier					
Project was completed within or below budget					
Additional cost for the minor scope changes is low					

2.5 This question is to assess ' Customer/ Client/ Employer Satisfaction'. Please select an answer by selecting an option as appropriate. * Mark only one oval per row.

Description	1	2	3	4	5
Customer/ client/ employer was satisfied					
Met the customer's/ client's/ employer's requirements Met the customer's/ client's/ employer's requirements					
Customer/ client/ employer is using the final output of the construction project effectively					

2.6 This question is to assess 'Impact on the Team/ Staff'. Please select an answer by selecting an option as appropriate. * Mark only one oval per row.

Description	1	2	3	4	5
Highly satisfied and motivated					
Highly loyal to the project					
Had high morale and energy					
Felt that working on this project was happy					
Staff experienced personal growth and development in carrier					
Staff wanted to stay in the organization					

2.7 This question is to assess 'Business and Direct Organizational Success'. Please select an answer by selecting an option as appropriate. * Mark only one oval per row.

Description	1	2	3	4	5
The project increased the organization's profitability					
The project has a positive return on investment					
The project increased the organization's new opportunities					
The project contributed to the organization's direct performance					

2.8 This question is to assess 'Preparation for the Future'. Please select an answer by selecting an option as appropriate. * Mark only one oval per row.

Description	1	2	3	4	5
Project outcome contributed to future projects					
Project led to additional new projects					
Project contributed to new business processes					
Project developed better managerial capabilities					

2.9 Please state if there are any other additional success dimensions/aspects relevant to this project. (optional)

.....

PART 3: Assessment on Top Management Support

Please answer the below-mentioned questions related to the Top-Management support of your company concerning the above-mentioned project in the PART 2. Please use a 1-5 Likert scale for indicating your opinion on the extent of use for questions no 3.1, 3.2 ,3.3 ,3.4 and 3.5.

1 = Not at all, 2 = Once in a while, 3 = Sometimes, 4 = Fairly often, and 5 = Frequently.

3.1 This question is to assess the aspect "Providing Resources" for the project by the Top management. Top management provided adequate financial, physical, and human resources to ensure the successful completion of the project. * Please select an appropriate option. Mark only one oval per row.

Description	1	2	3	4	5
Provided adequate financial, physical and human resources for the project					
Provided sufficient financial, physical and human resources for organizational change and system implementation (e.g., document management systems, ERP systems)					
Provided adequate financial, physical and human resources to encourage a supportive stakeholder environment					
Provided necessary financial, physical and human resources to support the project team during difficult/crisis situations					

3.2 This question is to assess the aspect "Structural Arrangements" by the top management for the project. Top management established and ensured the introduction of appropriate procedures, processes, and project structures to implement organizational change. * Please select an appropriate option.

Description	1	2	3	4	5
Planning and enforcing adequate project structures to achieve project objectives					
Setting suitable structures and strategies for usage of new systems, procedures and processes for the organization					
Changing the organization procedures and systems to strengthen the stakeholder's support					
Integrating with evolving technologies and tools, supporting the organization's digital transformation initiatives					

3.3. This question is to assess the aspect "Communication" by the top management for the project. Top management frequently communicated with various stakeholders to explain potential system changes and organizational implications. * Please select an appropriate option. Mark only one oval per row.

Description	1	2	3	4	5
Established frequent communication with project team members					
Communicated with the stakeholders to enhance organizational efficiency					
Communicated and explained regularly with project team members about the organizational changes and implications					
Communicated and discussed frequently about potential changes of the project with team					

3.4. This question is to assess the aspect "Expertise" by the top management for the project. Top management needs to possess sufficient knowledge and expertise in project management. Please select an appropriate option. * Mark only one oval per row.

Description	1	2	3	4	5
Having relevant expertise and experience in project management and identification of the changes and consequences related to the project					
Identification of the power of interest of stakeholders around the project and solving issues that beyond the control of the project manager					
Capability to understand the requirement for usage of the new technologies to the organization					
Motivating project team and recognizing the area that project team need to improve					

3.5. This question is to assess the aspect "Power" by the top management for the project. Top management exercised their power to support the project team during crisis and/or difficult times. Please select an appropriate option. * Mark only one oval per row.

Description	1	2	3	4	5
Used the power to support the project and protect team members					
Used its power to facilitate and enforce essential procedures and process changes					
Used its power to determine the roles and responsibilities of project stakeholders					
Used its authority to develop better project management capabilities in the organization					

3.6 Limitations/ challenges faced by Top Management when support for the project success.

(Please select appropriate answers, if any) (optional)

Check all that apply.

	Limited number of available resources	Lack of time to communicate effectively with relevant stakeholders	Changing scope / context of the project	Disagreements with the Senior Management / Executive Board
Providing resources				
Structural arrangements				
Communication				
Expertise				
Power				

3.7 Any other limitations/challenges faced by Top Management when support for the project success. (optional)

.....

3.8 Practices that used/propose to use to overcome the limitations and challenges that Top Management faced. (optional)

.....

APPENDIX – 2: RESPONSES ON LIMITATIONS AND CHALLENGES ENCOUNTERED BY TM

- Unawareness of the project severity/ duties
- Unawareness of the project severity
- Doubts on project team
- Lack of knowledge on new industry trends
- Misunderstandings
- Lack of knowledge on new procedures/ systems/ technologies
- Lack of knowledge in the field
- Lack of experience field
- lack of experience
- One major challenge is poor interpersonal skills of project team which led to conflicts
- Doubt or suspiciousness on the project team

APPENDIX – 3: RESPONSES ON PRACTICES TO ADDRESS LIMITATIONS AND CHALLENGES

- Standard Project Management software
- Usage suitable ERP systems or MS project/ Primavera
- Improve transparency of the process
- Participation to the knowledge sharing sessions
- Archive the lessons learnt and use for future projects management
- Suitable project management software
- Collaborative approach with industry
- Delegating the authorities to different level as appropriate
- Delegating power to middle managers
- Frequent meeting and open conversations with project team and top management
- conducted frequent meetings
- Implement a good communication option
- Develop the team building sessions/ continuous training
- customized system to smooth the communication path
- Propose to use standard Project management software
- Develop an advance communication method will minimize many challenges
- Used a customized project management system
- Use a proper/ transparent communication channel
- Previous project details/ experience should use
- Propose to use standard project management software to use resources efficiently
- Collaboration with other similar companies to identify new trends
- better to have meetings frequently
- ERP systems
- Customized project management software system used
- Propose to research on industry new practices
- Propose to used learnt lessons from previous projects
- Propose to use suitable project management software/ ERP usage