

The Impact of Planning on the Completion of Construction Projects in Saudi Arabia (Jubail City)

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Abstract

Project delays have been historically experienced in the Saudi Arabia construction industry, and has even increased recently with project failures becoming rampant due to poor project planning. The prevailing planning practice is fragmented leading to disjointed stakeholder engagement that hinder coordination affecting project timelines, cost and quality adversely. Therefore, this study investigates the impact of project planning on timely project completion, and identifies the key planning strategies, best practices and critical factors for effective project planning for favourable project outcomes with emphasis on project completion time. Using a mixed methods approach comprising of online surveys and in-depth interviews on workers and managers of the Royal Commission for Jubail and Yanbu, one of the major construction companies in Jubail, Saudi Arabia. Using a correlation analysis to examine its hypotheses, the results indicate that Project planning has a significant positive impact on the completion of construction projects in Saudi Arabia. Therefore, the study established that effective project planning plays an important role in improving project timelines, costs, quality, efficiency, and suitability, which are critical factors leading to successful project completion. Through a comprehensive review of the available literature and primary data from the study, the study identified adoption of modern technologies, investing in workforce development, cultivating a culture of open communication and collaboration among project staff and key project stakeholders, culture of continuous improvement, putting in place contingency plans, stakeholder engagement at the planning level and proactive risk management as critical factors for timely project completion. Having identified that modern technology plays a critical role in improving project timelines, this study calls for further studies to examine the adoption and impact of emerging technologies such as artificial intelligence on key project outcomes in the Saudi construction industry.

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Chapter 1.0 Introduction

1.1 Background of the topic

The construction industry is critical in a country's infrastructural and economic development. In Saudi Arabia, the construction industry contributed over 7.1% of the country's GDP in 2023, and is expected to grow at Compound annual growth rate (CAGR) of 2.75% to 2028, thereby contributing even more to the Saudi non-oil GDP (International Monetary Fund, 2023).

Saudi Arabia's construction industry is considered to be one of the largest in the Middle East and has significantly contributed to development of various mega projects related to basic infrastructure, and it is executed using pre-determined national plans (Alsulamy, 2022). Project planning is a critical component of project management that plays a significant role in success of a project. Effective project planning in project management directly influences key project outcomes including project cost, time and overall project success (Khan, Saher, & Yunis, 2019).

Effective project planning improves efficiency of project management processes, contributes to resource optimization streamlines processes and mitigates the risk of delays. Conversely, inadequate project planning could lead to unfavorable project outcomes such as delays in project schedule, cost overruns and cost issues that could lead to other undesirable consequences such as project variability that undermine investor confidence (Naeem, Khanzada, Mubashir & Sohail, 2018). As Saudi Arabia continues its growth trajectory in infrastructural development and economic diversification, effective planning remains imperative for timely project completion, which is critical for sustainable growth sought after in the Saudi construction industry (Ahmed et al., 2024).

1.2 Problem Statement

Recently, failures in construction projects have become rampant adversely affecting project completion schedules, with project planning being cited as one of the major contributors to project delays. A great deal of planning and coordination is required during and after work commencement, failure to which projects could not run smoothly (Alsulamy, 2015). Poor planning has been cited as one of the greatest contributors to project failure in the construction industry in Saudi Arabia. In the Saudi Arabia context, inadequate planning constituting of deficient risk assessment, inappropriate resource allocation to construction projects, and inadequate stakeholder

involvement collectively contribute towards undermining project success (Ikediashi, Ogunlana & Alotaibi, 2014).

One of the major challenges to Saudi Arabia's project planning practice is fragmented project planning processes that lead to disjointed stakeholder engagement undermining project coordination, which is critical for project completion (Alhammadi, 2022). Fragmented planning hinders holistic assessment of project status leading to misaligned project management strategies and conflicting practices leading to project failure. Furthermore, studies have also indicated that ambitious project timelines given by the Saudi government and key stakeholders in the construction industry exert pressure on project planning experts, leading to rushed planning that undermines project accuracy (Ahmad, Aftab, Eltayeb & Siddiqui, 2023).

Other aspects contributing to poor planning in Saudi Arabia's construction industry include inadequate attention to risk management practice (Alsulamy, 2022). Failure to pay attention and put in place mechanisms to mitigate potential risks, such as geopolitical issues, economic fluctuations and regulatory constraints leaves projects with high vulnerability to disruptions, delays and cost overruns. Furthermore, there is limited integration of technological advancements such as Internet of Things, Data Analytics, Artificial Intelligence, advanced scheduling software, etc. hinders planning that limits the capacity of contractors to optimize project outcomes.

In Saudi Arabia, the nexus between project planning and success has become a major concern amidst the country's ambitious infrastructural development endeavors. despite the widely acknowledged significance of planning on project completion, there is shortage of empirical studies that could lead to comprehensive project planning frameworks which exacerbates project risks, hinders multi-stakeholder collaboration that leads to project failure (Alghonamy, 2015). Despite the rapidly changing operating environment, project planning in Saudi Arabia has not evolved to match the challenges and risks affecting project success. Consequently, poor project planning has emerged as a major contributor to project failure. Fragmented project planning process, inadequate risk management and limited technological integration being the major issues affecting the efficacy of the country's project planning efforts, exacerbating project completion challenges, which ultimately impedes the country's development and growth efforts (Naeem et al., 2018).

1.3 Study Aim and Purpose

The primary aim of this study is to investigate the impact of planning on construction projects in Saudi Arabia, with emphasis on identifying some of the key factors and factors for successful project planning practices for timely project completion.

The purpose of the study is to highlight the significance of robust project planning for favorable project outcomes, elucidating mechanisms through which effective planning could facilitate project success. By highlighting planning strategies, best practices and critical success factors, the study will provide insights into the critical elements of effective project planning, thereby helping project management stakeholders to identify ways that they could contribute toward optimization of project outcomes, minimize risks and improve stakeholder satisfaction.

1.4 Research questions

1.4.1 Main research question

What is the impact of project planning on the completion of construction projects in Saudi Arabia?

1.4.2 Sub-questions

What are the characteristics or factors for effective project planning practices in the Saudi construction industry?

1. How does stakeholder involvement influence project planning in the Saudi construction industry?
2. How does integration of new technologies influence project planning in the Saudi construction industry.
3. How does risk assessment and management influence project planning in the Saudi construction industry?
4. What is the impact of effective project planning on project cost in the Saudi construction industry?
5. What is the impact of effective project planning on project quality in the Saudi construction industry?
6. What is the impact of effective project planning on project timelines in the Saudi construction industry?
7. What is the impact of effective project planning on efficiency in the Saudi construction industry?

8. What recommendations could be made to improve project planning and optimize project outcomes in the Saudi construction industry?

1.5 Research Hypotheses

H1: Stakeholder involvement has a significant positive impact on project planning in the Saudi construction industry.

H2: Integration of new technologies has a significant positive impact on project planning in the Saudi construction industry.

H3: Open Communication has a significant positive impact on project planning in the Saudi construction industry.

H4: Organizational culture has a significant positive impact on project planning in the Saudi construction industry.

H5: Effective project planning has a significant positive impact on project timelines in the Saudi construction industry.

H6: Effective project planning has a significant positive impact on project cost in the Saudi construction industry.

H7: Effective project planning has a significant positive impact on project quality in the Saudi construction industry.

H8: Effective project planning has a significant positive impact on efficiency in the Saudi construction industry.

H9: Effective project planning has a significant positive impact on project suitability in the Saudi construction industry.

H10: Effective project planning has a significant positive impact on project risk in the Saudi construction industry.

H11: Project planning has a significant positive impact on the completion of construction projects in Saudi Arabia.

1.6 Relevance and Importance of the study

The study makes a significant contribution to the Saudi construction industry, highlighting the pivotal role of project planning in ensuring successful delivery of construction projects. Understanding the factors that lead to effective project planning is important for cost-effective and

timely delivery of infrastructural projects, commercial and residential buildings, thereby contributing significantly towards the country's infrastructural and economic development as intimated in Alhammadi (2022).

The research contributes significantly to knowledge advancement in construction management by making practical, evidence-based recommendations on the role of project planning to ensure successful project delivery. The study serves to validate the established theoretical frameworks about the impact of project planning on project completion by providing empirical evidence based on primary data, and insights from practitioners in the Saudi construction industry (Ahmad et al., 2023).

Chapter 2.0 Literature Review

The chapter presents a critical review of relevant scholarly sources, key concepts, theories and findings from previous studies that contribute to the study topic. The findings, as elucidated in the previous studies form the basis for the propositions and hypotheses of the study.

2.1 The Concept of Project Planning

Planning, also referred to as project planning involves a process of designing the project scope, resources, timelines, etc. to ensure project delivery within the pre-defined constraints. It entails determining the tasks and setting reasonable timelines and schedules and organizing for resources that are required to get the project completed (Project Management Institute, 2017). Project planning is an important phase of the construction process that lays the foundation of effective project execution and control. It involves a comprehensive evaluation of the project requirements, the inherent risks and challenges involved, and presents a comprehensive plan that lays out the necessary measures to be put in place throughout the project lifetime to ensure timely completion (Pierce, 2013).

2.2 Project Planning in Saudi Arabia

Project planning in the construction industry is an important process for successful project execution. In Saudi Arabia, the development and evolution of project planning in the construction industry is largely shaped by various factors, including economic growth, technological advancements, and cultural factors. In the last 2 decades, Saudi Arabia has witnessed rapid development in the construction sector, fueled by its ambitious infrastructure and urbanization initiatives. However, despite the big ambitions and aspirations, the construction industry still faces challenges including delays, cost overruns, and quality issues that could be attributed to inadequate project planning practices (Abdulghafour & Salman, 2023).

Currently, international best practice on project management emphasizes on comprehensive risk assessment, realistic scheduling of tasks and projects, and stakeholder engagement. While these practices are acknowledged in Saudi Arabia, the construction industry in this country still struggles to integrate them into its project management practice effectively. This challenge has been attributed to cultural factors, bureaucratic red tapes, and overreliance on traditional project management approaches and tools have hindering the adoption of advanced planning techniques (Abdulghafour & Salman, 2023). Nevertheless, there have been significant efforts to improve

project planning practices in Saudi Arabia construction industry. This includes the government's Vision 2030 initiative, which aims at diversifying the economy to promote sustainable development, emphasizing on adoption of efficient project management processes whereby project planning is a critical factor. In addition, there have been increased calls for collaboration with international partners to facilitate knowledge transfer as well as the adoption of innovative planning methodologies (Emam, Abdelaal & Farrell, 2014).

It is undeniable that project planning in Saudi Arabia's construction industry has evolved and grown over time to respond to both internal and external project pressures. However, there is great room for improvement. As Abdulghafour & Salman (2023) indicate, adopting modern project planning techniques, improving stakeholder collaboration, and fostering a culture of innovation are critical for improved project outcomes and sustaining the country's growth of trajectory in the global construction landscape.

2.3 Significance of Project Planning

Project planning is widely recognized as a fundamental aspect of project management, playing a crucial role in ensuring project success. This critical literature review aims to examine the significance of project planning in project management by analyzing key insights and findings from existing research literature.

Effective project planning is a cornerstone for project success offering a roadmap for fulfilling project objectives within specified time, financial and quality constraints (Kerzner, 2017). Project planning is critical in identification and allocation of project resources, setting realistic timelines, and mitigation of potential risks and uncertainties in project execution (Barkley & Saylor, 2014). Moreover, project planning facilitates effective communication and coordination between project team members, and other stakeholders, which instils collaboration and alignment towards common project goals (Pinto & Triller, 2016).

Project planning plays an important role in risk management by facilitating proactive identification, assessment, and mitigation of project risks throughout the project from inception to completion (Hillson & Murray-Webster, 2017). Project planning enables project managers to anticipate potential challenges and develop contingency plans to address unforeseen events, thereby minimizing project disruptions and enhancing overall resilience (Chapman & Ward, 2011). Moreover, effective project planning facilitates the allocation of resource to activities

geared to risk mitigation and ensures implementation of appropriate measures for safeguarding project success (Flanagan & Norman, 2018).

Studies point to a strong correlation between project planning and performance, whereby well-planned projects exhibit success by meeting quality objectives, being executing within budget, and adhering to the set timelines (Turner & Müller, 2014). Therefore, by defining project scope, project deliverables, and milestones, project planning facilitates project teams in maintain their focus and direction, thereby improving project productivity and efficiency (Kloppenborg & Petrick, 2014). Furthermore, effective project planning enhances stakeholder satisfaction by ensuring project outcomes are aligned with the requirements and expectations of stakeholders (Shenhar et al., 2018).

2.4 Factors influencing project planning

Stakeholder involvement is crucial in project planning as it ensures that the project aligns with the expectations and needs of all relevant parties. Involving stakeholders from the early stages of planning enhances communication, builds trust, and promotes a sense of ownership, leading to greater stakeholder satisfaction and support throughout the project lifecycle (Smith & Erakovic, 2016).

Stakeholder involvement facilitate project planning by fostering collaboration, communication, and accountability. The major stakeholders for construction projects include clients, local communities, government agencies as well as users. Involving all these stakeholders ensures that the diverse perspectives and needs are considered at the project planning phase. This form of involvement promotes transparency and trust among the key stakeholders leading to effective decisions, minimal project-related conflicts, and a smooth project implementation process (Molwus, 2014).

Furthermore, stakeholder involvement may lead to harnessing of valuable insights about project risks, opportunities, as well as potential impacts, thereby enabling project managers to develop robust risk management strategies and risk mitigation plans. In the long run, stakeholder involvement is capable of creating a sense of ownership and commitment to the project, helping to align project objectives with the expectations of stakeholders and significantly contributing to project success (Yang & Shen, 2014).

Leveraging emerging technologies such as artificial intelligence, data analytics, and virtual collaboration tools enables project managers to streamline processes, optimize resource allocation, and accelerate decision-making, thereby improving overall project performance and competitiveness. The integration of modern technologies significantly improves project planning and construction project outcomes by enhancing efficiency, accuracy, and collaboration (Huang et al., 2018).

Technologies such as Building Information Modeling (BIM) could facilitate comprehensive visualization and simulation of construction projects, which enhances decision-making as well as coordination among key project stakeholders. In addition, advanced project management software could enhance stakeholder communication, sharing of documents and critical knowledge, and tracking project tasks, streamlining project workflows as well as reducing project errors. Generally, integration of modern technologies could optimize project planning processes, minimize risks, and improve key project outcomes such as project efficiency and satisfaction (Chiabert, Bouras, Noël, & Ríos, 2018).

Effective risk assessment and management are essential components of project planning, as they help identify, evaluate, and mitigate potential threats to project success. Integrating risk management into project planning enables proactive identification of risks, development of contingency plans, and allocation of resources to address uncertainties, thereby enhancing project resilience and reducing the likelihood of negative impacts on project outcomes (Hillson & Murray-Webster (2017).

Effective communication and collaboration are essential for successful project planning, as they facilitate coordination, alignment, and knowledge sharing among project stakeholders (Kerzner, 2017). Open communication enhances project planning by fostering collaboration, reducing misunderstandings, and facilitating stakeholder engagement. Clear and transparent communication channels facilitate effective exchange of information, knowledge that facilitates understanding of project goals, expectations as well as requirements by project parties (Atkinson & Crawford, 2006). Furthermore, open communication facilitates proactive problem-solving as well as decision-making leading to timely resolution of issues and reducing project delays (Adriaanse & Voordijk, 2005). In addition, frequent communication among the members of a project team, clients, and relevant stakeholders enhances accountability and facilitates alignment of project objectives, increasing the likelihood for project success. Open communication facilitates a positive

project environment that is open to collaboration and innovation leading to improved project outcomes (Caldas & Soibelman, 2004).

Organizational culture and leadership style influence project planning by shaping attitudes, behaviors, and decision-making processes within the project team and the broader organizational context. Organizational culture influences project planning and eventually project outcomes by shaping norms, values, and behaviors of project stakeholders which in turn influences their decision-making and collaboration. Therefore, a positive organizational culture improves project planning by fostering trust, teamwork, innovation and creating a conducive environment to effective project planning and execution (Shenhar et al., 2018).

When construction workers feel empowered and valued, they tend to actively participate in the project planning process, contribute ideas, and own the project goals, which eventually leads to project success. Furthermore, an organizational culture that values continuous learning and improvement and adoption of best practices significantly contributes to project success. In the long run, a strong organizational culture helps in aligning stakeholders' values with project objectives, which facilitates coordination, communication, leading to better project outcomes (Luong & Watanabe, 2017).

2.5 Challenges and limitations facing project planning

Despite its immense importance, project planning experiences a great deal of challenges and limitations. In practice, project planning is subject to obstacles including incomplete information, changing project requirements, and stakeholder interests that often complicate project planning process and therefore affect its outcomes (Rose, 2010).

Furthermore, too rigid or detailed project planning could be a hindrance to project adaptability and innovation, especially in today's dynamic and uncertain environment (Morris et al., 2014). Therefore, balancing the need for comprehensive planning with some degree of flexibility to provide for inherent changes and uncertainties presents a challenge to project managers (Geraldini et al., 2011).

Other challenges and limitations to project planning include inaccurate estimates, changes in project scope, resource constraints as well as conflicts between key stakeholders. Project planning often suffers inaccurate estimation of project timelines, costs, and resource requirements, which in turn lead to project delays and cost overruns. Project planning is affected by evolving requirements

and external pressures that threaten to disrupt project plans and strain allocated resources (Turner & Müller, 2005).

Project planning often suffers resource constraints as project managers contend with limited budgets or shortage of skilled labor that could hinder project delivery and quality (Kerzner, 2013). Furthermore, projects often face the challenge of conflicting stakeholder interests, and communication breakdowns at the planning phase diminishes chances for consensus-building affecting project delivery time. Overcoming these challenges needs a proactive risk management, effective communication, and adaptive planning strategies to ensure project completion and enhanced project outcomes (Rose, 2010).

2.6 Impact of project planning on key project outcomes

Project planning plays a critical in management of project time by establishing clear project timelines, milestones, and key deliverables that will guide the project execution and monitoring process (Haughey, 2019). Effective project planning provides a structured framework through which project managers can organize tasks, allocate project resources, and manage potential risks. Having a comprehensive project plan could lead to identification of critical path activities and dependencies, that would allow project managers to prioritize project tasks and allocate resources in an effective and efficient manner (Kerzner, 2013).

Furthermore, risk assessment at the project planning stage could enable proactive identification and mitigation of potential project delays and minimize their effect on project timelines. Clear communication of project objectives, milestones, and deadlines could lead to coordination and collaboration between project team members and stakeholders, leading to timely decision-making (Kerzner, 2013). In the long run, effective project planning creates a clear roadmap for project execution, which facilitate proactive management of project timelines, that increases the likelihood of project delivery within the stipulated timelines (Meredith & Mantel, 2012).

Effective project planning significantly influences cost management by providing a structured framework for budget estimation, allocation, and control. Effective project planning facilitates accurate budget estimation, appropriate resource allocation as well as project cost management strategies. Effective project planning facilitates identification of key project requirements and scope allowing for more precise cost estimation and contingency planning (Kerzner, 2013).

Furthermore, planning enables preparation of detailed project schedules and resource requirements which facilitates optimization of resource utilization. In the long run, effective project planning helps in creating a solid foundation for cost control at all phases of the construction project lifecycle, which leads to project cost control and other cost-related project outcomes (Chapman & Ward, 2003).

Effective project planning helps to enhance project quality by establishing clear project objectives, expected standards, and the appropriate processes to achieve them before project execution begins. Detailed project planning enables the identification of project requirements, setting of quality criteria, and determination of key project deliverables, which helps to align project specifications to stakeholder expectations and key industry standards (Kerzner, 2013).

In addition, creation of detailed project schedules and milestones helps to facilitate project monitoring and quality control throughout the project lifecycle, which enables timely identification and correction of project deviations from the established quality standards and minimize rework and projects defects that undermine project quality. In the long run, effective project planning helps to establish a strong foundation for delivery of high-quality projects that are consistent with end user and other stakeholder expectations (Meredith & Mantel, 2012).

Project planning ensures that project objectives, requirements, and deliverables are aligned with organizational goals, stakeholder expectations, and market needs (Turner & Müller, 2014). Effective project planning leads to enhanced project efficiency through resource utilization optimization, streamlining of workflows, and reducing wastage. Project planning facilitates identification of critical path activities, their dependencies, and resources required, which facilitates efficiency in allocation of project resources and scheduling (Kerzner, 2013). In addition, project planning helps in clear project objectives and milestones, which offer a roadmap for project execution, facilitating project teams towards prioritizing project tasks and focus their effort towards activities that are critical to project success (Meredith & Mantel, 2012).

Furthermore, contingency planning at the planning stage helps in mitigating potential disruptions to ensure uninterrupted project development and reduce potential delays (Chapman & Ward, 2003). In the long run, effective project planning offer basis for maximization of productivity and achievement of project objectives in an effective and efficient manner. By facilitating detailed task analysis, optimization of workflow, resource allocation, project planning helps to identify

opportunities for improvement in the project development process and resource optimization, to enhance project efficiency and productivity (Kloppenborg & Petrick, 2014).

Effective project planning is critical in enhancing project suitability by aligning project objectives to the needs of key stakeholders. Project planning facilitates comprehensive understanding of project requirements. In addition, clear communication and collaboration between key stakeholders during the project planning phase leads to identification of key deliverables and project success criteria, which ensures that project outcomes meet stakeholder expectations (Kerzner, 2013).

In addition, project planning facilitates proactive risk assessment and creation of mitigation strategies that could help in addressing potential defects and deviations from project specifications, enhancing project suitability to the intended purpose. In the long run, effective project planning helps to establish a solid foundation for delivery of well-suited projects that meet stakeholder needs and achieve the desired outcomes (Chapman & Ward, 2003).

Effective project planning encompasses risk management strategies that are directed towards identifying, assessing, and mitigating potential threats to project success. Proactive risk assessment at the project planning stage leads to identification and mitigation of potential quality-related issues (Hillson & Murray-Webster, 2017). Furthermore, proactive risk management at the project planning stage facilitates identification and mitigation of potential cost overruns, which helps in putting in place measures to ensure projects remain within budget provisions (Chapman & Ward, 2003). By assessing the potential risks in the initial project management stages at scope definition and analysis of project requirements, project managers are able to identify potential quality issues in advance and put in place preventive measures to mitigate the risks (Project Management Institute, 2017).

2.7 Strategies, best practices and critical success factors for timely completion of construction projects

Effective project planning is critical in setting clear project objectives, defining project scope, allocating resources effectively, and establishing realistic project timelines. As Kerzner (2013) notes, having a comprehensive project plan creates clear roadmap for project execution, helping in identifying potential risks and challenges that could delay project completion. Ofori (2013)

advises that it is important to involve all relevant stakeholders in the project planning process to align all stakeholder expectations, which improves their commitment to the project goals.

Studies such as Frefer, Mahmoud, Haleema & Almamlook (2018) have indicated that open and transparent communication among project teams, stakeholders, and contractors is critical for timely project completion. In their study, Al-Ageeli & Alzobaee (2016) posit that leveraging modern communication technologies and project management software fosters real-time collaboration and information sharing, which improves project efficiency.

Early identification, assessment and mitigation of project risks is critical for mitigating project delays and disruptions. Chapman & Ward (2003) posit that using a proactive approach to risk management and taking measures to mitigate their impact is critical to timely project completion. In another study, Al Mamlook (2018) posit that investing worker development and training programs ensures that construction teams have the skills, competencies and expertise to execute project in a timely manner.

In their study, Al-Ageeli & Alzobaee (2016) indicate that fostering a culture of continuous learning and development could improve the efficiency and productivity of workers. Ofori (2013) further noted that establishing strong relationships between suppliers, contractors and project teams is critical for timely project completion. In their study, Turner & Müller (2005) indicate that encouraging flexibility and adaptability is important in maintaining predictability amid the frequent changes in scope, requirements, and enables the construction teams to respond effectively to evolving circumstances.

In earlier studies, Forbes (2001) called for embracing a culture of continuous improvement and learning for enhanced project performance and timely completion. The authors call for collection of post-project reviews, capture of lessons learned, and implementation of best practices from previous projects and international exposure to help in identifying areas for improvement in future project planning and execution.

2.8 Theoretical Framework

The study adopts the contingency theory to explain the impact of planning on project success. Theory holds that there is no one-size-fits-all approach to project management, and that, effectiveness of project planning efforts is influenced other factors including project complexity, the prevailing organizational culture, and uncertainty in the operating environment (Turner &

Müller, 2014). This theory emphasizes the need for project managers to adapt their planning processes and strategies to suit the unique circumstances and requirements of each project.

In terms of project planning, the Contingency Theory highlights the importance of tailoring planning processes, techniques, and tools to the needs, characteristics and challenges of a specific project (Shenhar et al., 2018), such that projects with high uncertainty or complexity need more flexible planning approaches and need more emphasis on risk management and contingency planning to adapt to the changing project circumstances and mitigate the potential risks (Geraldini et al., 2011).

Therefore, the Contingency Theory illuminates the importance of employing context-specific planning and the need to tailor planning processes and strategies to ensure they fit the unique circumstances of specific projects. therefore, by embracing flexibility and adaptability in planning, project managers are able to enhance project outcomes by being able to address project challenges, mitigate risks, and maximize opportunities for success (Turner & Müller, 2014).

2.9 Conceptual Framework

Considering the arguments, observations, findings and conclusions of previous studies and key theoretical constructs, the study adopts the following theoretical framework with project planning being the independent variable and project completion being the dependent variable as illustrated below.



As indicated in figure 1 above, the independent variable is project planning which is influenced by factors such as stakeholder involvement, integrating new technologies, risk assessment and management, communication and collaboration, and the prevailing organizational culture. On the

other side, the dependent variable is project completion which is measured by the extent to which the project meets its timelines, cost and quality constraints. The extent of project completion could also be examined through efficiency of the project execution process and suitability of the project to its intended objectives or purpose.

Chapter 3.0 Methodology

3.1 Research design

The research adopted a mixed-methods approach that uses both quantitative and qualitative research methods to collect and analyses both qualitative and quantitative data. The quantitative aspect uses numerical data to establish the trends and relationships between the dependent and independent variables, contributing to the generalizability of the results of the study. On the other hand, a qualitative approach allows a detailed explanation of the trends established, enabling the research to develop deeper insights into the phenomena under study. Creswell & Plano Clark, 2011). The greatest advantage of a mix-method approach lies in its incorporation of the strengths of both qualitative methods surpassing the benefits of using one approach enabling a more robust and comprehensive study of the research topic (Creswell, 2013).

3.2 Target population

The target population for the research included workers in the construction industry who have first-hand experiences with project planning and its impact on project outcomes. The study involved workers and managers of the Royal Commission for Jubail and Yanbu, one of the major construction companies in Jubail, Saudi Arabia. The quantitative survey involved employees involved in project planning and management, and the in-depth interviews involved senior managers in the construction company.

3.3 Sampling and sample size

Respondents in the qualitative aspect of the research were selected through purposive sampling. Random sampling ensures a representative sample whereby each member of the target population has a fair chance of being selected, eliminating selection bias, which contributes to the generalizability of research findings (Noor, Tajik & Golzar, 2022). The online survey was shared on the company's platforms and 175 surveys were filled by the target respondents. However, during data cleaning and preparation for analysis, 25 cases were found to be incomplete and were discarded leaving a sample size of 150 respondents that was used in the study. The 5 respondents in the in-depth interviews were recruited using purposive sampling which allows the flexibility to purposely select information-rich respondents with the required knowledge, experience and expertise to provide insights into the research (Creswell, 2013).

3.4 Data Collection methods

The quantitative aspect was undertaken using an online survey on staff involved in project management. The survey was undertaken using a questionnaire owing to its convenience, ability to reach larger sample sizes and consistency in responses to allow for quantitative analysis of results needed (Creswell & Plano Clark, 2011).

Data collection in the qualitative aspect was undertaken using in-depth one-on-one interviews with project managers and key staff involved in project planning who will offer detailed explanations and insights into the project planning process and its impact on project completion. The in-depth interviews were undertaken using semi-structured interview guides that offer flexibility to enable the respondents to give detailed responses and elaborate their answers (Newcomer, Hatry & Wholey, 2015).

3.5 Data Analysis Methods

Quantitative data from the surveys was analyzed statistically using statistical tools like SPSS (Statistical Package for the Social Sciences, SPSS v.25). This involved analysis of statistical tests such as descriptive statistics to analyses the demographical characteristics of the respondents. Hypothesis testing will be undertaken using a correlation analysis as indicated in Rahman & Muktadir (2021).

The results were presented in tables, charts, graphs, etc. The responses from the in-depth interviews were analysed using a thematic analysis, which involves identifying key points and perspectives from the responses obtained and analyzing them to inform the findings of the study as intimated by Dawadi (2020).

3.6 Ethical considerations

The research was undertaken in strict conformity to the ethical considerations guiding interviews and online surveys. This entailed seeking permission from the construction company to allow its employees to participate in the study, obtaining informed consent from the selected participants before collecting responses from them and employing mechanisms to maintain the privacy and confidentiality of the participants in the study as outlined in Creswell (2013).

3.7 Limitations of the study

Given that the study adopted a mixed-method approach, it means that the design minimized the limitations of a single quantitative or qualitative approach. However, this research design is resource intensive, and too a great deal of time and personnel to execute.

Chapter 4: Results, Findings and Discussions

The fourth chapter presents the results of the online survey and findings from the interviews from the respondents in the study. This begins with the demographic information of the participants, and then delves into testing the hypotheses of the study, juxtaposed with discussions, comparing the results and findings of the study with earlier findings from the literature review.

4.1 Demographic Details

This section presents the demographic description of the respondents in the study including the gender, age, academic qualifications, positions and the working experience of the respondents in the study.

4.1.1 Gender of the respondents

Details about the gender of the respondents in the study are summarized in table 4.1 below.

Table 4.1: Gender of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	130	86.7	86.7	86.7
	Female	20	13.3	13.3	100.0
	Total	150	100.0	100.0	

As indicated in table 4.1 above, there was no gender balance in the survey whereby 130 out of the 150 respondents representing 86.7% of the respondents were male, and 20 participants representing 13.3% of the respondents were female. This trend was expected as the prevailing cultural and religious beliefs in Saudi Arabia limit participation of women in gainful employment. In addition, given that the survey was undertaken in a male-dominated construction, the number of females is further limited. Although the number is statistically small, it is significant, indicating that awareness about inclusion and diversity in work setups is being embraced in Saudi Arabia. Having such a number of women is encouraging to women in the Middle East to join and excel traditionally male dominated fields such as the construction industry as intimated in UNDP (2022).

4.1. 2 Age of the respondents

Results on the age of the participants in the study are summarized in table 4.2 below

Table 4. 2Age group of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24 yrs	16	10.7	10.7	10.7
	25-30 yrs	36	24.0	24.0	34.7
	31-35 yrs	26	17.3	17.3	52.0
	36-40 yrs	47	31.3	31.3	83.3
	41-45 yrs	25	16.7	16.7	100.0
	Total	150	100.0	100.0	

As indicated in table 4.2 above, 16 respondents representing 10.7% of the population sample were between 18 and 24 years old, 36 respondents representing 24% of the population sample were between 25 and 30 years old, 26 respondents representing 17.3% of the population sample were 31 to 35 years old, 47 respondents representing 31.3% of the population sample were between 36 and 40 years old, and 25 respondents representing 16.7% were between 41 and 45 years old. This indicates that the respondents of the study were fairly young and could actively participate in the survey.

4.1.3 Academic Qualifications of the respondents

Results of the academic credentials of the respondents are summarized in table 4.3 below.

Table 4 3:Academic Qualifications of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Certificate	18	12.0	12.0	12.0
	Diploma	101	67.3	67.3	79.3
	Bachelor's degree	25	16.7	16.7	96.0
	Master's degree	6	4.0	4.0	100.0
	Total	150	100.0	100.0	

All participants in the study had some level of education ranging from certificate to masters. As indicated in table 4.3 above, 18 respondents representing 12% of the population sample had attained up to certificate level of education, 101 respondents representing 67.3% of the population sample had achieved diploma level, 25 respondents representing 16.7% of the population sample

had bachelor's degrees, and 6 respondents representing 4% of the population sample had master's degrees. It is evident that all participants in the study had formal education, were therefore informed and could give credible and reliable responses to the research questions.

4.1.4 Experience

The years of experience that each respondent has worked have been summarized in table 4.4 below.

Table 4.4: Years of experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 yrs or Less	62	41.3	41.3	41.3
	6-10 yrs	38	25.3	25.3	66.7
	11-15 yrs	32	21.3	21.3	88.0
	16-20 yrs	10	6.7	6.7	94.7
	21-25 yrs	5	3.3	3.3	98.0
	26-30yrs	3	2.0	2.0	100.0
	Total	150	100.0	100.0	

The respondents in the study were asked to identify the number of years that they have worked in the Saudi construction industry. As indicated in table 4.4 above, 62 respondents representing 41.3% of the population sample indicated that they have worked for five years or less, 38 respondents representing 25.3% of the population sample indicated that they had worked for 6 to 10 years, 32 respondents representing 21.3% of the population sample indicated that they had worked for 11 to 15 years, 10 respondents representing 6.7% of the population sample indicated that they had worked for 16 to 20 years in the Saudi construction industry, 5 respondents representing 3.3% of the population sample indicated that they had worked for 21 to 25 years, and 3 respondents indicated that they had worked for 26 to 30 years in the Saudi Arabia construction industry. This indicates the survey recruited respondents that have experience in the Saudi construction industry and could therefore give highly valuable and insightful perspectives to the study.

4.1.5 Position

The positions held by the various participants in the survey are summarized in table 4.5 below.

Table 4.5: Position of the respondent in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Equipment Operator	76	50.7	50.7	50.7
	Construction foreman	28	18.7	18.7	69.3
	Quantity Surveyor	34	22.7	22.7	92.0
	Civil Engineer	9	6.0	6.0	98.0
	Site Supervisor	3	2.0	2.0	100.0
	Total	150	100.0	100.0	

As indicated in table 4.5 above, 76 respondents, representing 50.7% of the population sample were equipment operators, 28 respondents representing 18.7% of the population sample were construction foremen, 34 respondents representing 22.7% of the population sample were quantity surveyors, 9 respondents representing 6% of the population sample were civil engineers and 3 respondents representing 2% of the population sample were site supervisors. This indicates that the respondents in the study were qualified and experienced in the construction industry, and could offer insightful and highly valuable perspectives to the study. Eventually, this adds to the credibility and reliability of the research findings.

4.2 Hypothesis Testing

A correlation analysis was used to conduct hypothesis testing and the results are shared as follows.

Hypothesis 1

Based on the early findings of the study as elucidated in the literature review, the first hypothesis for the study was stated as:

H1: Stakeholder involvement has a significant positive impact on project planning in the Saudi construction industry.

H0: Stakeholder involvement does not have a significant positive impact on project planning in the Saudi construction industry.

A correlation analysis was used to test the relationship between these two variables and the results are summarized in table 4.6 below.

Table 4.6: Correlation between Stakeholder involvement and project planning

Correlations

		Stakeholder Involvement	Project Planning
Stakeholder Involvement	Pearson Correlation	1	.708**
	Sig. (2-tailed)		.000
	N	150	150
Project Planning	Pearson Correlation	.708**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.6 above, Pearson correlation (r) for the relationship between stakeholder involvement and project planning is strongly positive and statistically significant ($r = .708$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis for the study is rejected.

These results concur with earlier findings of the study whereby Smith & Erakovic (2016) indicated that stakeholder involvement is crucial in project planning as it aligns project objectives with stakeholder expectations thereby increasing the likelihood of project success. The findings are also consistent with earlier findings by Molwus (2014) who indicated that stakeholder involvement will foster project collaboration and communication that leads to accommodation of diverse perspectives in project planning, which bolsters stakeholder trust and reduces stakeholder conflicts in construction projects leading to smooth project execution.

Hypothesis 2

Based on the findings in the literature review, the second hypothesis for the study was stated as:

H1: Technology integration has a significant positive impact on project planning in the Saudi construction industry.

H0: Technology integration does not have a significant positive impact on project planning in the Saudi construction industry.

A correlation analysis was undertaken establish the nature of the relationship between these two variables and the results are summarized in table 4.7 below.

Table 4.7: Correlation between Stakeholder involvement and project planning

Correlations

		Technology Integration	Project Planning
Technology Integration	Pearson Correlation	1	.679**
	Sig. (2-tailed)		.000
	N	150	150
Project Planning	Pearson Correlation	.679**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.7 above, Pearson correlation (r) for the relationship between technology integration and project planning is strongly positive and statistically significant ($r = .679$, $p < .01$). Based on these results, the alternative hypothesis is accepted and the null hypothesis is rejected.

The findings of this study mirror earlier findings by Huang et al. (2018) that integrating technologies such as BIM could enhance project planning by helping in simulation and visualization of the project, which improves decision-making and makes project coordination easier. The study findings also echo earlier findings by Chiabert et al. (2018) who posited that leveraging on new technologies such as AI could help project managers to streamline project activities, share critical knowledge and documents, and optimize the planning process by identifying and mitigating potential project risks.

Hypothesis 3

On the basis of early findings of the study as recorded in the literature review, the third hypothesis for the study was stated as:

H1: Open Communication has a significant positive impact on project planning in the Saudi construction industry.

H0: Open communication does not have a significant positive impact on project planning in the Saudi construction industry.

A correlation analysis was carried out determine the nature of the relationship between these two variables and the results are summarized in table 4.8 below.

Table 4.8: Correlation between Open communication and project planning

Correlations		Open Communicatio n	Project Planning
Open Communication	Pearson Correlation	1	.852**
	Sig. (2-tailed)		.000
	N	150	150
Project Planning	Pearson Correlation	.852**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.8 above, Pearson correlation (r) for the relationship between open communication and project planning is strongly positive and statistically significant ($r = .852$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

These study findings reinforce earlier findings by Kerzner (2017) who had highlighted the critical role of open communication in facilitating coordination, minimizing project-related misunderstanding, confusion and conflicts, hence facilitating stakeholder engagement in the project planning and execution process. The study findings also reflect the earlier position taken by Caldas & Soibelman (2004) who intimated that open communication could enhance stakeholder accountability and alignment of project aims with stakeholder interests facilitating effective project planning and increasing the likelihood of project success.

Hypothesis 4

Based on early research findings and enumerated in the literature review, the fourth hypothesis for the study was stated as:

H1: Organizational culture has a significant positive impact on project planning in the Saudi construction industry.

H0: Organizational culture does not have a significant positive impact on project planning in the Saudi construction industry.

A correlation analysis was carried out to test the relationship between these two variables and the results are summarized in table 4.9 below.

Table 4.9: Correlation between organizational culture and project planning

Correlations

		Organizational Culture	Project Planning
Organizational Culture	Pearson Correlation	1	.829**
	Sig. (2-tailed)		.000
	N	150	150
Project Planning	Pearson Correlation	.829**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.9 above, Pearson correlation (r) for the relationship between organizational culture and project planning is strongly positive and statistically significant ($r = .829$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

These findings are consistent with earlier findings whereby Shenhar et al. (2018) posited that a positive organizational culture shapes the norms, values and eventually the behavior of project stakeholders and workers, creating a conducive environment where stakeholders can freely participate project planning and contribute their ideas. The findings also reinforce earlier findings in the study by Luong & Watanabe (2017) who indicated that when workers feel valued, they actively participate in the project planning and offer valuable ideas, and could therefore take ownership of project goals, which is critical in successful project planning and execution.

Hypotheses 1 to 5 were used to examine the influence of stakeholder involvement, integration of technology, open communication and organizational culture on the project planning process. The results indicate that all these factors have a significant positive impact on project planning, and therefore could significantly improve project planning in the construction industry of Saudi Arabia.

As indicated in the above discussions, these findings conform to early findings in the literature review that highlight the significant positive impact of these factors on the project planning process.

Hypothesis 5

Informed by the early findings of the study as highlighted in the literature review, the fifth hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on project timelines in the Saudi construction industry.

H0: Effective project planning does not have significant positive impact on project timelines in the Saudi construction industry

The relationship between these two variables was assessed using a correlation analysis and the results are summarized in table 4.10 below.

Table 4.10: Correlation between Project planning and project timelines

Correlations

		Project Planning	Project Time
Project Planning	Pearson Correlation	1	.818**
	Sig. (2-tailed)		.000
	N	150	150
Project Time	Pearson Correlation	.818**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.9 above, Pearson correlation (r) for the relationship between project planning and project time is strongly positive and statistically significant ($r = .818$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

The findings of this study are consistent with numerous previous studies that have highlighted the positive impact of planning on project delivery time. For instance, the findings of the study conform to early findings of the study by Haughey (2019) which indicates that project planning help in improving project time by setting clear project timelines, key milestones and project deliverables that are supposed to be achieved at each stage. The findings conform to the earlier findings in the study by Kerzner (2013) who intimated that project planning helps in prioritization

of project tasks, coordination and collaboration between key stakeholders leading to quick decision-making. The findings also agree with the assertion by Meredith & Mantel (2012) that project planning offers a clear roadmap to be followed in executing projects increasing the likelihood of projects to be delivered within the set time.

Hypothesis 6

On the basis of early research findings as highlighted in the literature review, the sixth hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on project cost in the Saudi construction industry

H0: Effective project planning does not have a significant positive impact on project cost in the Saudi construction industry.

The correlation between these two variables was assessed through correlation analysis and the results are summarized in table 4.11 below.

Table 4.11: Correlation between Project planning and project cost

Correlations		Project Planning	Project Cost
Project Planning	Pearson Correlation	1	.687**
	Sig. (2-tailed)		.000
	N	150	150
Project Cost	Pearson Correlation	.687**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.11 above, Pearson correlation (r) for the relationship between project planning and project cost is strongly positive and statistically significant ($r = .687$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

This is consistent with findings in previous studies such as Kerzner (2013) who indicated that project planning provides a framework for cost estimation, allocation and control that are critical

cost management strategies that could ensure a project is completed within budget. The research findings further reflect the assertion that project planning helps in optimization of resource utilization, which minimizes wastage of project resources. The findings mirror early findings by Chapman & Ward (2003) indicating that project planning facilitates preparation of cost schedules and resource needs creating a foundation for project cost control.

Hypothesis 7

Based on the findings of the study as enumerated in the literature review, the seventh hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on project quality in the Saudi construction industry.

H0: Effective project planning does not have a significant positive impact on project quality in the Saudi construction industry.

The relationship between these two variables was tested using a correlation analysis and the results are summarized in table 4.12 below.

Table 4.12: Correlation between Project planning and project quality

Correlations		Project Planning	Project Quality
Project Planning	Pearson Correlation	1	.737**
	Sig. (2-tailed)		.000
	N	150	150
Project Quality	Pearson Correlation	.737**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.12 above, Pearson correlation (r) for the relationship between project planning and project quality is strongly positive and statistically significant ($r = .737$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

The findings of this research reinforce earlier findings by Kerzner (2013) that project planning helps in identification of project requirements and setting quality criteria and helps in aligning project specifications with stakeholder expectations and industry standards. These findings are also consistent with the findings in the study by Meredith & Mantel (2012) that project planning helps in creating project schedules that guide quality control and monitoring facilitating early identification and correction of errors and deviations from project specifications, establishing a strong foundation for delivery of high-quality projects in a timely manner.

Hypothesis 8

Based on the findings of the study as enumerated in the literature review, the eighth hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on efficiency in the Saudi construction industry.

H0: Effective project planning does not have a significant positive impact on efficiency in the Saudi construction industry.

The relationship between these two variables was tested using a correlation analysis and the results are summarized in table 4.13 below.

Table 4.13: Correlation between Project planning and project efficiency

Correlations		Project Planning	Project Efficiency
Project Planning	Pearson Correlation	1	.647**
	Sig. (2-tailed)		.000
	N	150	150
Project Efficiency	Pearson Correlation	.647**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.13 above, Pearson correlation (r) for the relationship between project planning and project efficiency is strongly positive and statistically significant ($r = .647$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

These findings illuminate earlier findings in the study by Kerzer (2013) that project planning helps in identification of critical path activities and resource requirements enhancing efficiency in project execution process. These findings support earlier observations by Turner & Müller (2014) that project planning helps in aligning project objectives, requirements and deliverables improving the efficiency in the project management process. Furthermore, the study findings are consistent with earlier findings by Chapman & Ward (2003) who indicated that project planning helps in creating contingency plans that help in mitigating potential disruptions, which increases the efficiency of the construction process.

Hypothesis 9

Based on the early research findings as indicated the literature review, the ninth hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on project suitability in the Saudi construction industry.

H0: Effective project planning does not have a significant positive impact on project suitability in the Saudi construction industry.

The relationship between these two variables was tested using a correlation analysis and the results are summarized in table 4.14 below.

Table 4.14: Correlation between Project planning and project suitability

Correlations		Project Planning	Project suitability
Project Planning	Pearson Correlation	1	.807**
	Sig. (2-tailed)		.000
	N	150	150
Project Risk	Pearson Correlation	.807**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.14 above, Pearson correlation (r) for the relationship between project planning and project suitability is strongly positive and statistically significant ($r = .807$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

These findings are consistent with early findings in the study by Kerzner (2013) indicating that project planning facilitates project suitability by aligning the objectives of the project to the needs of key stakeholders. Furthermore, the study findings reinforce earlier findings in the study by Chapman & Ward (2003) project planning creates a foundation of delivery of well-suited project that are consistent with stakeholder needs.

Hypothesis 10

On the basis of early research findings as recorded the literature review, the tenth hypothesis for the study was stated as:

H1: Effective project planning has a significant positive impact on project risk in the Saudi construction industry.

H0: Effective project planning does not have a significant positive impact on project risk in the Saudi construction industry.

The relationship between these two variables was assessed through a correlation analysis and the results are summarized in table 4.15 below.

Table 4.15: Correlation between Project planning and project risk

		Project Planning	Project Risk
Project Planning	Pearson Correlation	1	.607**
	Sig. (2-tailed)		.000
	N	150	150
Project Risk	Pearson Correlation	.607**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.15 above, Pearson correlation (r) for the relationship between project planning and project suitability is strongly positive and statistically significant ($r = .607$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

These findings reinforce early findings by Hillson & Murray-Webster (2017) that project planning helps in identification, assessment and mitigation of potential risks leading to project success. The findings further mirror early findings by the Project Management Institute (2017) that project planning helps in identifying potential quality issues thereby helping managers to put in place mechanisms to mitigate identified risks.

Hypothesis 11

On the basis of early research findings as recorded the literature review, the eleventh hypothesis, which was the overall hypothesis for the study was stated as:

H1: Project planning has a significant positive impact on the completion of construction projects in Saudi Arabia.

H0: Project planning does not have a significant positive impact on the completion of construction projects in Saudi Arabia.

The relationship between these two variables was assessed through a correlation analysis and the results are summarized in table 4.16 below.

Table 4.16: Correlation between Project planning and Project completion

Correlations

		Project Planning	Project Completion
Project Planning	Pearson Correlation	1	.706**
	Sig. (2-tailed)		.000
	N	150	150
Project Completion	Pearson Correlation	.706**	1
	Sig. (2-tailed)	.000	
	N	150	150

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

As indicated in table 4.16 above, Pearson correlation (r) for the relationship between project planning and project completion is strongly positive and statistically significant ($r = .706$, $p < .01$). Therefore, the alternative hypothesis is accepted and the null hypothesis is rejected.

This was the main hypothesis for the study seeking to establish the impact of project plan on project completion in Saudi Arabia. These findings confirm that indeed project planning could enhance project completion. These findings concur with earlier findings in the study by Khan et al. (2019) that project planning positively influences key project outcomes including cost, time and quality that are critical to overall project success or completion. These findings conform to the earlier observations by Naeem et al. (2018) that project planning improves the overall efficiency of the project management process and significantly contributes towards optimization of project resources towards achievement of project goals. The findings reinforce the findings made by Ahmed et al. (2024) that project planning contributes to timely completion of projects in the Saudi construction industry.

4.3 Strategies, best practices and critical success factors for timely project completion in Saudi construction industry.

In-depth interviews were conducted on key project managers and site engineers about the key strategies, critical success factors that are critical for timely completion of projects, their responses are sampled below.

Comprehensive project planning

Respondents in the in-depth interviews emphasized the importance of comprehensive project planning as a foundational element for timely project completion. For instance, in his response to the question about the critical success factors for timely project completion, the first respondent, a project manager at Royal Commission for Jubail and Yanbu stated,

"Effective project planning is critical in anticipating the potential challenges and risks, helping to ensure that key factors are considered in the project before execution."
(respondent 1).

This response was reinforced by the third respondent, a senior site engineer for the Royal Commission for Jubail and Yanbu, saying,

"There is need for detailed plans that outline the project objectives, scope, timelines, and resource allocation to ensure everything is undertaken using a plan and any deviation from the plan can then be investigated and addressed" (respondent 2).

Other respondents in the in-depth interviews echoed these sentiments highlighting the importance of project planning in timely project completion. A similar stance was observed throughout the literature review whereby studies such as Kerzner (2013) and Chapman & Ward (2003) emphasizing the need for project teams to undertake effective project planning to identify potential challenges and risks and address them in order to deliver construction projects in a timely manner.

Effective communication and collaboration

Respondents in the in-depth interview identified open communication and collaboration as one of the critical success factors for timely project completion. For instance, while responding to the question about the critical success factors for timely project completion, the second respondent said,

“Clear communication and collaboration are key in ensuring every stakeholder is kept in the know, which helps to minimize stakeholder conflicts that derail completion of construction projects in Saudi Arabia” (respondent 2).

In his response to the same question, the fourth respondent also alluded to the communication and collaboration aspects saying,

“Open communication and collaboration are in building understanding and trust among key stakeholders” (Respondent 4).

These findings echo earlier findings from the literature review such as Frefer et al. (2018) and Caldas & Soibelman (2004) who intimated that clear communication and collaborative decision-making helps in keeping all parties aligned and informed throughout the project lifecycle, which leads to timely completion of construction projects.

Proactive risk management

Respondents in the in-depth interviews also identified proactive risk identification, assessment and mitigation as an important aspect in project planning and project execution. This is illustrated by the response of the fifth respondent in the study who noted,

"By anticipating the project risks in advance and developing contingency plans to mitigate them, we can reduce their impact on project timelines," (respondent 5).

Similar sentiments were shared by the third respondent who highlighted the importance of adopting a proactive risk management approach saying,

“Regular risk assessments and scenario planning are critical in project management, helping project teams to stay ahead of potential challenges” (respondent 3).

These findings mirror earlier findings in the study by Chapman & Ward (2003) that early risk identification helps in putting in place measures to mitigate the risk, hence minimizing its impact on project timelines, cost and quality.

Workforce training and development

In the in-depth interviews, workforce development and training emerged as one of the key strategies for enhancing project efficiency and completion. For instance, while responding to the question about critical success factors for timely completion of projects, the first respondent said,

“A well-trained workforce is critical in the effort to achieve delivery of projects on time and desired quality standards,” (respondent 1).

Similar sentiments were observed in the response of the fourth respondent, who said,

“Training and development of technical staff is critical in equipping them with effective skills and improving their productivity, which are critical for timely completion of projects” (respondent 4).

These responses concur with study findings in the literature review such as Al Mamlook (2018) and Turner & Müller (2005) which emphasize on the need for continuous training on new technologies, construction methods, as well as safety practices to that ensure that the workforce is equipped with the necessary skills and expertise to deliver construction projects within the stipulated timelines.

Stakeholder relationships

Respondents in the in-depth interviews identified effective supplier and contractor management as critical success factors for timely project completion. In his response to the question about critical success factors for timely project completion, the third respondent reiterated,

"Establishing strong relationships with suppliers and contractors is critical as it ensures required quality materials and services are delivered on time," (respondent 3).

In his response, the fourth respondent emphasized the importance of having reliable project partners with a proven track record of delivering quality work on schedule. The respondent said,

"Having reliable suppliers and contractors is critical to project success. Projects with reliable partners with a track record of quality and time consciousness will help in achieving the objective of timely completion of projects" (respondent 4).

These responses echo early research findings in the study by Ofori (2013) that fostering effective stakeholder relationships could lead to smooth running of operations leading to timely completion of construction projects.

Adaptability and flexibility

In the in-depth interviews, adaptability and flexibility were identified as critical factors in timely completion of projects. For instance, the fifth respondent indicated

"Flexibility is critical in project planning as it helps project teams to accommodate necessary changes to the project to ensure timely completion of quality projects" (respondent 5).

In his response, the fourth respondents raised the aspect of adaptability in project execution to ensure projects and construction teams are in a position to cope with changes in the operating environment. The response said,

Adaptability is crucial in these evolving circumstances to ensure teams adapt to the changes in the external environment to ensure they maintain project quality and timelines," (respondent 4).

These findings are consistent with earlier arguments presented in previous studies including Turner & Müller (2005) and Kerzner (2013) calling for the need to navigate and understand the dynamic nature of the construction industry and anticipate and respond to changes in project scope, requirements, and external factors to ensure timely project delivery,

Continuous improvement

Respondents in the in-depth interviews highlighted the importance of continuous improvement in achieving project efficiency. For instance, when responding to the question about critical success factors for timely project completion, the third respondent intimated,

"Learning from past projects and embracing the best practices is critical in enhancing project completion within the stipulated timelines," (respondent 3).

The fourth respondent also gave a candid response to this question, saying,

"Conducting post-project reviews, capturing the lessons learned, and identifying key areas of improvement are critical in achieving timely project completion among other desirable outcomes," (respondent 4).

These findings concur with the findings in the study by Al-Ageeli & Alzobaee (2016) and Chapman & Ward (2003) that identify continuous improvement by embracing lessons from previous projects and implementing best practices from better performing projects to achieve desired results in the current project.

Summarily, the findings from the thematic analysis of in-depth interviews undertaken on project managers and supervisors in the Saudi construction industry highlights the significance of comprehensive project planning, effective communication and collaboration, proactive risk management, skilled workforce development, supplier and contractor management, adaptability, and continuous improvement as critical success factors for timely project completion. By prioritizing these strategies and best practices, the industry could overcome most challenges, and enhance its ability to achieve timely project delivery among other desired project outcomes.

Chapter 5: Conclusions and Recommendations

This chapter presents the culmination of the study presenting the research findings and insights derived the study. The chapter presents a synthesis of the results obtained in the study, discusses their implications, and provides actionable recommendations to improve project planning and optimize project outcomes in the Saudi construction industry.

5.1 Conclusions

The study has examined the impact of project planning on completion of construction projects in Saudi Arabia. Impact on construction project outcomes. Through a comprehensive review of literature and an online survey and in-depth interviews, the study established that effective project planning plays an important role in improving project timelines, costs, quality, efficiency, and suitability, which are critical factors leading to successful project completion.

Before examining the impact of project planning on project completion, the study explored the factors influencing project planning in the Saudi construction industry. An integration of findings from literature review and the results of the correlation analysis of the responses from the online survey helped to establish that modern technologies, stakeholder involvement, open communication and organizational culture significantly enhance project planning processes and key project outcomes.

After examining the factors influencing project planning, the study went ahead to examine the impact of project planning on project completion. This begun by identifying some of the key factors influencing project completion. Through a comprehensive literature review, the study identified project time, cost, quality, communication, suitability, and project risk as the key determinants for successful project completion. Using both primary and secondary data, this research has established that effective project planning is critical in improving project timelines by enabling identification of critical path activities, the resource requirements, resource allocation and scheduling (Kerzner, 2013).

The study has also found that setting clear project objectives and milestones at the project planning stage provides a clear roadmap for project execution, which enables project teams to prioritize tasks and focus on activities and processes that are critical to project success as earlier intimated by Meredith & Mantel (2012). In addition, this study contends that proactive risk management and contingency planning, which are undertaken at the project planning stage help in identifying

potential challenges and uncertainties that hinder project development as schedule, which enhances the suitability of the project for its intended purpose as denoted earlier by Chapman & Ward (2003). Therefore, this research concludes that effective project planning establishes a solid foundation delivering projects suit stakeholder needs and desires.

Furthermore, the study highlighted the significant impact of effective project planning on project costs. The analysis demonstrated that thorough planning enables accurate estimation of project timelines, costs, and resource requirements, minimizing the risk of delays and cost overruns (Kerzner, 2013). Moreover, proactive risk assessment and mitigation strategies help address potential challenges and uncertainties, reducing the likelihood of unexpected expenses and budget overruns (Chapman & Ward, 2003). Additionally, clear communication and collaboration among stakeholders during the planning phase facilitate the identification of key deliverables and success criteria, ensuring that project outcomes meet stakeholder expectations (Atkinson & Crawford, 2006).

In addition to project timelines and costs, the study has also underscored the importance of effective project planning in improving project quality. The research has also confirmed that comprehensive project planning facilitates more understanding of the project requirements, helps in identification of key deliverables and success criteria, which ensures that project outcomes meet stakeholder expectations as intimated earlier by Kerzner (2013). Furthermore, the study has found that proactive risk assessment and putting in place the appropriate mitigation measures helps in identifying and addressing the potential challenges and uncertainties, which enhancing the suitability of a project to the intended purpose as denoted in Chapman & Ward (2003).

Having established that project planning improves key project outcomes including project cost, quality, time, suitability, efficiency and mitigates projects risks, this study concludes that effective project planning has a positive impact on project completion by facilitating achievement of project goals within the scheduled project time. However, the research agrees with the caution by Naeem et al. (2018) that the project time and

Despite the significant positive impact that has been associated with effective project planning on timely project completion, the study established that project planning in the Saudi construction industry faces challenges and limitations that undermine its effectiveness. Among other challenges, the study found inaccurate cost estimates, frequent changes in project scope, resource

constraints as well as stakeholder conflicts as the major challenges limiting the effectiveness of project planning in the Saudi Arabia construction industry.

The research further established there is limited skilled labor in the Saudi construction industry, with a majority of technical workers being foreign technicians and expatriates that go back to their countries or find greener pastures leaving the Saudi construction to be always on a recruit spree to replace their critical staff who have left the industry. Furthermore, the study established that the Saudi Arabia construction industry has traditional hierarchical organization structures that slow down the project planning and execution process with approvals taking longer than in more streamlined project management environments. The research also notes the role of complex regulatory frameworks and bureaucratic red tapes that cause delays in obtaining key approvals, which hinders timely project delivery.

The study also sought to understand the strategies, best practices and critical success factor for early completion of construction projects in Saudi Arabia. From review of the available literature and insights from the in-depth interviews among key project managers, the study established that comprehensive project planning and helps to identify potential challenges and risks and therefore helps to ensure timely project completion. The study established that effective communication, collaboration and stakeholder involvement at the planning stage as intimated by Al Mamlook (2018) are critical for timely project completion.

Furthermore, the study established that leveraging on modern technologies and having a skilled workforce to adequately deploy that technology in project planning, execution and monitoring enhances efficiency and productivity leading to early project completion as intimated by Ofori (2013). In addition to stakeholder involvement at the planning phase, the study also identified effective contractor and supplier management as an important aspect in ensuring timely project completion. This research also contends that maintaining flexibility and adaptability in project management approaches, and embracing a culture of continuous learning are critical for timely project delivery in the highly evolving construction industry as advised by Turner & Müller (2005).

5.2 Recommendations/ Implications of the study findings to the Saudi construction industry

Laying emphasis on comprehensive project planning

The research has underscored the importance of comprehensive project planning in the Saudi construction industry, encouraging construction companies to allocate sufficient time and resources in developing detailed project plans that could help in identifying and minimizing risks and uncertainties to enhance project predictability. The study has established that putting in place contingency plans could enhance resilience and improve efficiency for timely project completion.

Adoption of modern technologies

The study has elaborated the importance of leveraging modern technologies such as BIM, project management software and collaborative technologies to enhance communication and streamline project planning processes to improve efficiency. Increased adoption of these technologies in the Saudi construction industry could enhance project planning, improve collaboration that could lead to timely project completion among other desirable project outcomes.

Investing in workforce development

Given the challenges related to labor shortages and skill gaps, investing in workforce development and training programs is crucial. By providing training on new technologies, construction methods, and project management practices, the industry can equip its workforce with the necessary skills and expertise to execute projects more efficiently and effectively.

Cultivating a communication and collaboration culture

This research has illustrated the importance of open communication and collaboration among project stakeholders, and holds that implementing effective communication strategies and embracing a culture of collaboration could enhance coordination, reduce stakeholder conflicts, and foster timely decision-making for smooth project execution and timely delivery.

Cultivating a culture of continuous improvement

The culture of continuous improvement has been identified as one of the best practices for successful project completion. Therefore, this study encourages construction companies to develop and inculcate a culture of using post-project reviews, capturing lessons learned from previous projects, and implementing best practices from previous projects to drive improvement in project planning and execution processes for timely project completion.

Proactive risk management

The study has elucidated the importance of early risk identification and mitigation in reducing disruptions and delays in project delivery. Therefore, this research encourages Saudi construction companies to conduct risk assessments during project planning, develop contingency plans, and monitor to address emergent risks throughout the project lifecycle as this could mitigate the impact of unforeseen challenges and uncertainties increasing chances for timely project completion.

Cultivating a culture of continuous improvement

The research has underscored the importance of embracing a culture of continuous improvement in the Saudi construction industry, and encourages construction companies to embrace collecting post-project reviews, capturing lessons learned, and implementing best practices from previous projects to drive the current improvement initiatives in project planning and execution processes for timely completion of projects.

5.3 Recommendations for further studies

Throughout the study, the role of modern technologies in enhancing communication and collaboration that could enhance efficiency, among other desired project outcomes. However, the study did not identify such particular technologies and elucidate the impact on project management process. There is need for future studies to focus on investigating the adoption and impact of emerging technologies such as artificial intelligence, and Internet of Things (IoT) in project management practices within the Saudi construction industry. This study could explore how these technologies are being utilized to improve project planning, execution, and monitoring, and identify challenges and opportunities associated with their implementation.

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أثر التخطيط على إنجاز المشاريع الانشائية في المملكة العربية السعودية (مدينة الجبيل)

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المستخلص

لقد شهدت صناعة البناء والتشييد في المملكة العربية السعودية تاريخياً تأخيراً في الكثير من المشاريع، وقد زادت في الآونة الأخيرة مع انتشار فشل المشاريع بسبب سوء التخطيط. إن ممارسة التخطيط السائدة تدار بطريقة غير مناسبة في كثير من الأحيان مما يؤدي إلى مشاركة غير فعالة لأصحاب المصلحة وذلك يعيق التنسيق المتبادل بين الأقسام مما يؤثر بشكل سلبي على الجداول الزمنية للمشروع والتكلفة والجودة.

تبحث هذه الدراسة تأثير التخطيط الفعال على إنجاز المشروع في الوقت المناسب، وتحدد استراتيجيات التخطيط الرئيسية وأفضل الممارسات والعوامل للتخطيط الفعال للمشروع لتحقيق نتائج مواتية للمشروع مع التركيز على وقت إنجاز المشروع. استخدام نهج مختلط يتكون من استطلاعات عبر الإنترنت ومقابلات متعمقة مع العمال والمديرين في الهيئة الملكية للجبيل وإحدى شركات البناء الكبرى في مدينة الجبيل. وباستخدام تحليل الارتباط لفحص فرضياته، تشير النتائج إلى أن تخطيط المشاريع له تأثير إيجابي كبير على إنجاز مشاريع البناء في المملكة العربية السعودية. لذلك، أثبتت الدراسة أن التخطيط الفعال للمشروع يلعب دوراً مهماً في تحسين الجداول الزمنية للمشروع والتكاليف والجودة والكفاءة والملاءمة، وهي عوامل حاسمة تؤدي إلى إنجاز المشروع بنجاح.

من خلال مراجعة شاملة للبيانات الأولية من الدراسة، حددت الدراسة اعتماد التقنيات الحديثة، والاستثمار في تنمية القوى العاملة، وتنمية ثقافة التواصل المفتوح والتعاون بين موظفي المشروع وأصحاب المصلحة الرئيسيين في المشروع، وثقافة التحسين المستمر، ووضع خطط الطوارئ، وإشراك أصحاب المصلحة على مستوى التخطيط وإدارة المخاطر الاستباقية كعوامل حاسمة لإنجاز المشروع في الوقت المناسب. بعد تحديد أن التكنولوجيا الحديثة تلعب دوراً حاسماً في تحسين الجداول الزمنية للمشروع، تدعو هذه الدراسة إلى إجراء مزيد من الدراسات لدراسة اعتماد وتأثير التقنيات الناشئة على نتائج المشاريع الرئيسية في المملكة العربية السعودية.