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A Study on the Causes of Delays in the Schedule Execution of Construction
Projects in the City of Jeddah

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CHAPTER 1



Introduction

In recent years, Saudi Arabia has undergone rapid urban and infrastructural development, particularly in major cities such as Jeddah. While these initiatives align with the Kingdom's Vision 2030 goals, many construction and infrastructure projects continue to experience delays in schedule execution. These delays are not limited to minor inefficiencies but reflect deeper structural, administrative, and contractual challenges that compromise project delivery timelines, increase costs, and reduce stakeholder satisfaction. This research addresses the persistent issue of project delays by examining not only technical factors but also behavioral and organizational dimensions. The study begins by identifying the problem: the frequent assignment of complex projects to unqualified main contractors, the extensive use of subcontracting chains, client-imposed unrealistic timelines, and the absence of internal governance mechanisms in executing entities. These factors have been identified as root causes that often result in fragmented accountability, poor planning, and reactive project management.

The study sets forth clear research objectives, including investigating the role of contractor qualifications, subcontracting structures, client behaviors, and internal controls. It also aims to propose actionable strategies to improve project governance and schedule reliability. To guide the inquiry, the research is structured around five key research questions and supported by corresponding hypotheses. From a scientific and theoretical perspective, the study contributes to the existing body of knowledge by integrating a multi-theoretical framework. The application of Agency Theory, Systems Theory, the Theory of Constraints, and Institutional Theory offers a comprehensive lens through which to analyze the systemic nature of project delays. These theories can be used to illuminate the means through which the panel of motivators, complexity, limitations, and institutional forces can determine the result of the project.

The study also contributes to the existing body of knowledge in local and international literature in that; it synthesized current literatures on the topic besides outlining its own contribution to the subject, especially the full-scale, cross-cutting style that targets the city of Jeddah. Study methodologically uses qualitative research, bearing selective quantitative indicators. Such tools as document review, observational data, and limited project metrics were applied to the triangulation of findings and the increase of credibility. Though no interviews and surveys were conducted, the analysis was based on the actual project records and the experience of cases.

Lastly, the chapter lists the study limitations, which include geographic focus in Jeddah, use of qualitative data, as well as limited access to some sectors and organizations. Such limitations are clearly indicated to provide directions in the interpretation of results and to establish the extent of applicability. By implementing this combined practice, the study will aim at generating practical recommendations and empowering the creation of more accountable, efficient and resilient project delivery systems in Saudi Arabia.

Problem of Statement

Although there have been many investments in infrastructure and construction undertakings in Saudi Arabia, the bottlenecks in the execution of projects and delivery have been an unending issue. Delays like these do not just screw up what was planned in advance and increase costs but also affect the confidence of the stakeholder, operate against the planning of operations and most importantly the overall impact of the capital expenditure.

One of the main roots, which have been identified, is that large and complex projects have been assigned to main contractors without being technically and organizationally prepared to deal with them effectively. Such contractors do not always have adequate internal engineering resources, planning skills and project maturity to execute projects on their own. As a result, they rely heavily on subcontracting, sometimes even to lower levels in sub-subcontractors; this leads to loose coordination, less accountability, and poor-quality control.

In addition, this is also complicated by client-side pressure. Clients often give unrealistic timelines because they have to match an internal goal or political agenda. Main contractors who are driven by the need to win the contract regularly agree to such impractical terms even though they are aware that they are simply impractical. On some other occasions, contractors provide manipulated or inaccurate project schedules to meet the expectations of the clients, thus causing a core mismatch between planning and implementation even as the project starts.

Additionally, this is worsened by a lack of sound internal governance structures and formal project controls in most contracting organizations. Lacking formal arrangements to realistically plan, systematically manage risk management, and performance monitor decision-making becomes reactive, profits-driven, and short-term in orientation. The absence of internal checks and balances also undermines the schedule discipline and project management.

It is in this regard that this study aims to shed some light on this systemic problem by examining the behavioral patterns, organizational gaps as well as the relationship between the clients and contractors who collectively end up delaying schedules. Based on the analysis, the research shall propose viable methods to enhance project governance, improve contractor selection process and the reinforcement of schedule integrity.

Study Objectives

The primary objective of this study is to critically analyze the root causes of project schedule delay and establish useful controls that can improve on-time project delivery within industries. Instead of focusing on the isolated technical deficiencies, the study analyses the systemic and behavioral reasons that always undermine the success of project implementation.

The primary objectives of this study are as follows:

- To analyze the impact of outsourcing projects to unqualified main contractors who do not possess the technical competence, planning skills, and internal governance arrangements necessary to complete projects on time and to quality standards.
- To analyze the role of multilayered subcontracting structures in causing schedule delays, especially when responsibility is fragmented among subcontractors and sub-subcontractors, creating non-accountability and inefficiencies in coordination.
- To examine the effect of unrealistic client-directed project timelines, where such expectations compel lead contractors to undertake unattainable milestones for the promise of clinching deals, oftentimes in the obligation of submitting forged or doctored project timelines.
- To find out the impacts of the absence of formalized internal procedures within performing organizations, particularly the absence of systematic planning, control processes, and monitoring of performance on a regular basis—all major ingredients in efficient project control and discipline in regard to planned schedules.
- In order to develop a functional recommendation to be utilized in enhancing project governance, client–contractor relationship structures, contractor prequalification requirements, and enhancing the use of realistic and team planning tools in early phases of a project.

Eventually, it is hoped that this research would help in the creation of more robust project delivery mechanisms, whose decision-making is done through feasibility, transparency, and accountability instead of commercial exigency or opportunism. The findings of this research are hoped to help public and private sector entities reduce delays as well as the overall failure rate of their projects.

Study Importance – Scientific & Theoretical

The issue of project delays is a ubiquitous problem of various industries, ranging between the fields of technology, logistics, public-service and manufacturing sectors. This kind of delay causes economic losses, the poor utilisation of available resources, undermines stakeholder satisfaction, and damages the reputation in some cases. The determination of the causes of the delay and how they occur in schedules is therefore crucial in the overall performance of the project and the delivery of the project within the expected timeliness and on the existing scope.

This research makes a significant contribution to the fact that it highlights the systemic barriers that await the successful implementation of projects, regardless of the industry. The major concern that comes into the light is the assigning of the project duties to the main contractors or the vendors who do not have sufficient technical competence, organisational strength, or performing capability. With such unqualified contractors, it is common that they rely on these subcontractors and more sub-subcontractors with the essential components of the project in order to have a fractured implementation, poor accountability, and a collapse of the coordination.

Another aspect that is considered is the stress brought about by customers who enforce unrealistic project deadlines. Such deadlines are often motivated by internal politics or other interests and not by honest planning or resource determination. Although most contractors know that such plans are impossible, most of them accept these terms to win a contract, and at some point, they might provide fabricated or distorted programs to meet the needs of a client. It is a practice that balls in the risk factor and adds to eventual project delays.

Another aggravating factor is that there are no strong internal mechanisms of governance in executing organisations. In most cases, the absence of standardised process planning structures and systematic performance monitoring levels also lead to reactive decision-making processes as opposed to proactive decision-making. In many cases, there are no formalised procedures to direct project teams or to keep them answerable to realistic agendas.

This study also makes contributions not only through the diagnosis of causes of delay but also through recommendations on how issues of the delay could be improved through improvement in terms of project governance matters, enhanced partnership between the client and the contractor, and the improvement of planning accuracy. Such knowledge can benefit numerous stakeholders, such as project managers, senior executives, policymakers as well as procurement professionals working in various domains both in the public and in the private sector.

Research Questions

This study is guided by a central research theme: understanding why project delays continue to occur across various sectors despite advances in project management practices and tools. To explore this theme, the study addresses several key research questions:

1. What is the impact of assigning projects to unqualified main contractors on project schedule performance?

This question investigates how the lack of technical expertise, planning capability, and execution experience among main contractors contributes to delays in project delivery.

2. How does multilayered subcontracting affect project timelines and coordination?

This question explores whether the delegation of work to subcontractors and sub-subcontractors leads to fragmented responsibility, poor communication, and reduced control over critical project activities.

3. What extent do unrealistic client-imposed project schedules influence contractors' planning behavior?

This question examines the client's role in delay scenarios, particularly how pressured or commercially motivated timelines lead contractors to submit inaccurate or non-executable project plans.

4. What are the consequences of the absence of internal governance frameworks within main contracting organizations?

This question addresses whether the lack of internal rules, procedures, and accountability systems inside execution teams contributes to unstructured and reactive project management.

5. What practical strategies can be adopted to minimize project delays across different sectors?

This final question seeks to extract lessons from the findings and translate them into solutions, policies, or frameworks that stakeholders can implement to improve schedule reliability.

By answering these questions, the study aims to deliver a well-rounded understanding of the structural and behavioral factors behind project delays and to suggest practical paths toward more timely and accountable project execution.

Study Hypotheses

This study is based on several working hypotheses that reflect observed patterns in project environments across different sectors. These hypotheses address the structural, organisational, and behavioral factors contributing to project delays. They act as source of gathering, parsing and confirmation of data in the study process.

- Unqualified main contractors whose projects are slated to run late as compared to the technically competent and experienced contractors.

This hypothesis is based on the assumption that the qualification and internal capacity of main contractor play an important role in the performance of project schedules.

- Risk of project delays is enhanced by use of multi-levels of subcontracting (subcontractors and sub-subcontractors).

It is also postulated that subcontracting chains that are convoluted result in a diffused accountability, ineffective coordination, and smashed communication, all of which adversely influence the delivery schedules.

- Most projects where clients have unrealistic deadlines that form part of the contract conditions tend to run behind term because of the impossibility of the set milestones.

This assumption indicates that such pressure to meet the deadlines set by clients, even when not practical, leads to the cases where contractors present false or highly optimistic schedules.

- Failure of project schedule can be attributed by the lack of internal governance systems and project controls processes among the contracting organisations.

In this case, the hypothesis is that absence of formal procedures, planning protocols, and performance tracking can result into a reactive and unproductive project implementation.

- A set of realistic scheduling and standards of prequalifying contractors and internal project governance will minimise the chances of project delays.

The hypothesis will highlight the theory that advancing basic aspects in project planning and implementation will present more assurances.

Theoretical Framework

This research is grounded in a series of interconnected theory glasses that together shed light on the systemic explanations of Saudi construction context project delay. These theories provide explanations to explain behavior, form, and organisational processes, confining timely project delivery.

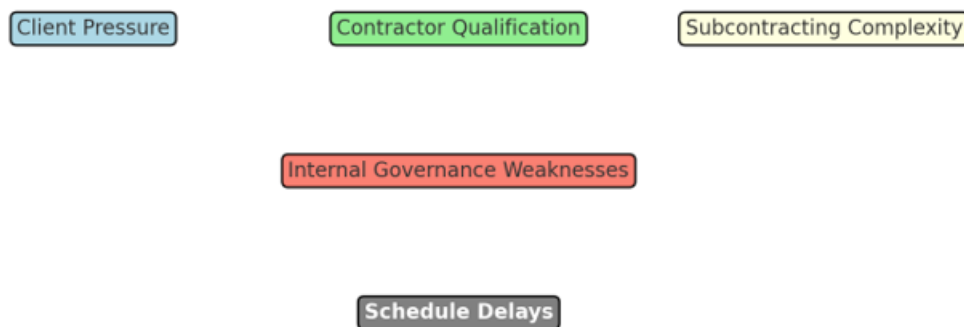


Figure 1 Theoretical Framework Linking Organizational Factors to Schedule Delays

- **Agency Theory**

Agency Theory resolves the agency issue between clients and contractors. It explains here how divergent interests—like clients imposing unrealistic deadlines and contractors complying to achieve maximum business leverage—translate to compromise planning and eventual delay. Contractors prefer short-term contractual revenues at the cost of long-term success in project delivery.

- **Systems Theory**

Projects are envisioned as systems with interdependent components such as resources, stakeholders, timing, and work flows. Systems Theory describes why chain breakdowns due to the failure in one subsystem, i.e., poor subcontracting or inadequate resources, lead to the overall project delay. This view requires end-to-end planning and integrated delivery.

- **Theory of Constraints (TOC)**

Theory of Constraints assumes that the output of any project is limited by its most limiting constraining factors. Constraints like unqualifiedly skilled contractors, strict schedules, or poor governance in this research are referred to as the primary delivery performance issues. Prevention and avoidance of constraints are very important in carrying out projects on time.

- **Institutional Theory**

Institutional pressures—such as client expectations, political deadlines, or market norms—shape organisational behaviour. This theory explains why many contractors accept unrealistic project conditions out of fear of losing contracts, even when it results in long-term inefficiencies.

- **Project Governance Framework**

Institutional Theory considers how external pressures—including client expectations, political imperatives, and industry norms shape organizational behavior. This theoretical lens explains why contractors often accept infeasible project terms to maintain market competitiveness, despite the risk of generating long-term inefficiencies and delivery failures.

Methodology and Research Methods

The research paper is based on a qualitative approach which however is backed by some quantitative data, to examine the causes of project schedule delays within Saudi Arabia specifically in Jeddah. Given the complex, multi-layered, and often behavioral nature of these delays, a qualitative approach is most appropriate to capture the depth and context of the problem.

1. Document Review

Official project documents such as schedules, contract terms, change orders, and meeting minutes were reviewed to cross-validate statements from interviews and understand the formal basis of project planning and delay reporting.

2. Observational Data

Informal observations from site visits and internal meetings were included to understand how project decisions were executed in practice and how stakeholder behavior affected progress.

3. Quantitative Support

Where applicable, project KPIs such as baseline vs. actual delivery dates, cost variance, and number of subcontracting layers were analyzed to quantify the scale and frequency of delays.

4. Data Analysis Approach

Interview transcripts and documents were analyzed using thematic analysis, where patterns, repeated concerns, and root causes were categorized and mapped against the study's theoretical framework. Quantitative indicators were also summarized to reinforce the qualitative findings.

5. Ethical Considerations

Participants were informed of the study's purpose and their input was kept confidential. No project names, client names, or individuals were identified to ensure full compliance with ethical standards.

Study Tools

This study relies on a set of well-selected research tools designed to collect comprehensive and accurate data regarding project execution and delivery delays. The tools were developed to align with the mixed-methods approach (both quantitative and qualitative), enhancing data richness and ensuring the credibility of the findings.

The below are the primary study tools used:

1. Questionnaire:

A key tool for quantitative data collection, the questionnaire was designed in electronic format and included a series of closed-ended, structured questions. It was directed towards the measurement of participants' views on:

- Causes of project delays.
- Administrative and technical factors influencing schedules.
- Impact of delays on cost and quality.
- Effectiveness of tracking and monitoring tools in use.

A set of survey instruments was sent to a defined population of project managers, engineers, contractors and consultants, and the statistical analysis of the results was carried out with the help of statistical software.

2. Semi-Structured Interviews:

These selected professionals experienced in project management were probed on semi-structured interviews in order to get deeper qualitative analysis. An open-ended question was also incorporated in these interviews, and individuals were free to share their experience regarding schedule delays, the most critical challenges, and mitigation strategies that they employed practically.

3. Document Analysis:

This was an instrument that was way into looking at actual schedules and progress reports of actual projects that had been done or are being done. This was done with the aim of comparing the scheduled schedules with the actual performance in order to determine any scheduling gaps.

When combined, these tools show a complete, well-rounded, and triangulated source of data to comprise the well-rounded support of evidence that such a research can offer to the field.



CHAPTER 2



Introduction

Discovering which factors may influence performance of project schedules is paramount in improving the performance of the projects according to the delivery of the projects especially in complex and rapidly changing environments like Saudi Arabia. Weak time schedules are a prevalent phenomenon in the context of construction and infrastructure projects that not only affect the delivery time and cost of the project but also the other aspects of capital expenditures, namely, the confidence of stakeholders, efficiency of resources, and value to the larger whole. The same chapter lays out a very solid foundation to study these challenges by explaining the important variables behind the study, summarising the relevant literature, and providing the theoretical framework based on which the study will be conducted.

In the chapter, the dependent variable, that is, project schedule delay, will be defined, initially. This variable gives the difference between the planned and the actual finish dates of a project as a direct measure of efficiency in the execution of the project. Delay in schedules not only indicates time deviation but is an indication to more fundamental inadequacies in planning, coordination, and control activities. With the view of this variable, the study aims to identify the organisational and managerial factors contiguous to the provision of delayed projects in the construction sector in Jeddah, in particular.

In describing the incidence and magnitude of delay in the schedule, the chapter also presents the major independent variables that will be under analysis. These are (1) qualification status of the lead contractor, (2) complexity and scope of subcontracting chains, (3) the impact of impossibly short deadlines requirement set by clients, (4) whether internal governance mechanisms exist or not in contracting firms. All these variables have been hypothesised to have a strong impact on the probability and magnitude of delays in a project. These matters are examined collectively in order to evaluate their interaction and the reasons that they lead to poor performance of schedules in real project settings.

The chapter then goes to the literature review which summarises and discusses major studies that have been conducted to study the project delays in Saudi Arabia. Recurrent causes of delay have been noted in seminal works by Assaf and Al-Hejji (2006), Alzahrani and Emsley (2013) and Al-Kharashi and Skitmore (2009) who have cited inadequate capacity of contractors, unrealistic planning expectations, poor coordination and weak internal controls as some of the main causes of delays. These studies provide valuable insights but often focus narrowly on technical or operational challenges. In contrast, the current study takes a broader, more integrated approach that considers behavioural, structural, and institutional dimensions of project execution. The literature review also identifies gaps that this research seeks to address, including the lack of cross-sectoral analysis and the limited application of integrated theoretical models.

By integrating these elements—variables, literature, and theory—this chapter establishes a robust foundation for the research. It enables the study to move beyond identifying surface-level symptoms and instead investigate the deeper structural and behavioral causes of

project delays. The chapter aims to provide clarity on the relationships between organisational practices and schedule performance, paving the way for the empirical analysis and recommendations presented in later chapters.

Dependent Variable

The dependent variable in this study is project schedule delay. It refers to the variance between the planned completion date and the actual completion date of a project. Schedule delay serves as the key performance outcome that this research aims to analyse and explain.

Project schedule delay in the context of this study is influenced by a number of factors that include qualification of the principal contractor, the complexity of subcontracting arrangements, the presence or lack of internal governance mechanisms as well as unrealistic deadlines imposed by clients. The magnitude and occurrence of delays are among the important measures of the effectiveness of delivering a project and its general efficiency in carrying it out.

The evaluation of schedule delay will aid in determining the effects of various organisational and managerial factors on the timely execution of construction projects. Therefore, clarity on what the dependent variable represents is crucial towards locating the actual causes of scheduling problems and drawing judicious ways of improving the performance of a schedule in construction projects that will take place in Jeddah.

Independent Variables

The independent variables in this research are the major factors believed to have an effect on the incidence and magnitude of the project schedule delays. The variables are the cause variables in focus and are categorised according to their organisational, contractual, and managerial dimensions. With each independent variable, it is assumed to have a direct or indirect effect on the dependent variable, project schedule performance.

The major independent variables found in the present study are as follows:

- **Contractor Qualification**

This means the technical, managerial, and operational ability of the main contractor to whom the project is assigned. Such contractors with inadequate experience or organisational preparedness will likewise not be able to handle schedules and thus increase the likelihood of delay.

- **Subcontracting Complexity**

It is linked to the degree to which the prime contractor depends on multi-tiered subcontracting contracts. Increased sophistication in subcontracting tends to lead to fragmented communication channels, diluted accountability, and coordination problems, all of which contribute to schedule overruns.

- **Client-Imposed Unrealistic Schedules**

This translates to client-imposed project schedules with no basis in reasonable planning assumptions or real resource limitations. These pressures imposed from the outside have the potential to push contractors hastily into providing unwarranted or faked schedules, which end up resulting in delayed deliveries.

- **Lack of Internal Governance**

This is a failure of effective internal planning, risk management, and monitoring of performance by contracting firms. Internal governance which is not effective will inevitably lead to reactive choices and non-compliance with planned timetables. Every independent variable is studied systematically to identify its association with project scheduling performance.

The research expects to offer stakeholders facts on the most contributory factors to delays and recommend mitigation countermeasures against them to enhance schedule reliability in construction.

Summary and Discussion of Literature Review

Delayed projects are a major problem in Saudi Arabia, and they have been noticed in both state and privately sponsored projects. Many researchers who conducted surveys have found similar reasons each time for schedule overruns, such as unqualified contractors, unrealistic client requirements, subcontracting complexity, and the absence of in-house controls in executing entities.

A study by Assaf and Al-Hejji (2006) is perhaps among the most quoted studies, which was wide-ranging research of large construction projects in Saudi Arabia. Their conclusion demonstrated that late work was mainly occasioned by the contractor's poor qualifications, inefficiency in planning and management of resources. Contractors that do not have technical and organisational capacity end up delaying even high-budget projects.

Another substantial research was conducted by Alzahrani and Emsley (2013) regarding the performance of the contractor, and the lack of internal project managing systems was attributed to delays in the project. It was revealed that a number of local contractors, especially in Jeddah, did not have systematic procedures for planning, monitoring, and execution, thus causing mismatched expectations and unmanaged schedules.

Al-Kharashi and Skitmore (2009) investigated the role of project owners in delay scenarios. Their research highlighted how many clients in Saudi Arabia enforce unrealistic project timelines—often driven by political or administrative pressures—which leave contractors with inadequate time for proper planning and mobilization. This leads to delays even before execution begins.

Additionally, Albogamy et al. (2012) documented the challenges caused by the widespread reliance on multi-layered subcontracting. Many main contractors delegate work to subcontractors and sub-subcontractors, resulting in fragmented control, weak communication, and accountability breakdowns.

Similarities and Differences with the Current Study

The previous studies and the current research share common ground in recognizing the following key factors:

- Gaps in contractor qualifications
- Unrealistic scheduling pressures
- Fragmented subcontracting structures
- Absence of internal governance and planning systems

However, this study offers several distinct contributions:

- It applies a multi-theoretical framework—including Agency Theory, Systems Theory, Theory of Constraints, and Institutional Theory—to provide a deeper interpretation of project behavior and structure.
- It extends the scope beyond construction to include logistics, infrastructure, and public services in the city of Jeddah, offering a broader cross-sectoral perspective.
- It combines document analysis and performance data (such as KPIs and schedule performance) to support a more comprehensive understanding than many earlier studies.

What Makes This Study Unique

While earlier research primarily focused on technical or operational inefficiencies, this study adopts a holistic approach that integrates both behavioral and governance factors. It uniquely:

- Examines how client behavior and institutional pressure influence contractor planning decisions
- Analyzes internal governance gaps within contracting organizations, not just external project constraints
- Proposes practical recommendations based on real project documentation and performance data

This broader scope allows the study to bridge the gap between theory and real-world project execution, offering new insights for policymakers, project managers, and procurement professionals operating in Saudi Arabia.

Theoretical Framework of the Study

This study is grounded in a set of interrelated theories that collectively explain the structural, organizational, and behavioral factors contributing to project schedule delays. These theories provide a conceptual lens through which to interpret the complex dynamics between clients, contractors, and project environments in Saudi Arabia. By applying a multi theoretical framework, the study moves beyond surface-level causes and examines deeper institutional and systemic issues that influence project execution outcomes.

- **Agency Theory**

Agency Theory has examined the principal-agent relationship between the contractor and the customer from the perspective of how divergent interests and information asymmetry can lead to inefficiencies. In this regard, it explains how the customer will demand unrealistic timetables for either internal or political reasons, while contractors will agree to such terms to obtain the contracts despite being aware that the timetables are unrealistic. Such incongruity of ends is likely to cause project lags.

- **Systems Theory**

Systems Theory defines a project as an active system of interdependent entities—processes, schedules, stakeholders, and resources. Interference of any one of them, for example, contractors' activities or managing subcontractors, could create chain reactions throughout the entire project system. This theoretical framework directs the investigation of this study on why subcontracting complexity and lack of integration result in schedule overruns.

- **Theory of Constraints (TOC)**

Theory of Constraints argues that every system contains a limited capability to achieve goals through one or more bottlenecks. For construction project management, the bottlenecks can be non-skilled labourers, ineffective assets, or rigidly defined schedule specifications. The bottlenecks must be discovered early and resolved proactively in order to preserve timeline integrity and enhance overall project performance.

- **Institutional Theory**

Institutional Theory addresses how external world pressures—realised as industry practices, client specifications, and political timetables—impact organisational behaviour. Contractors can compromise on prevailing market specifications or client design at the cost of even though this compliance jeopardises the reality of planning and executing projects. This perspective accounts for why unrealistic timetables claimed by clients are prevalent in a good majority of Saudi projects despite glaring issues with feasibility.

- **Project Governance Structure**

A successful project governance structure creates well-delineated roles, clear accountability, transparent decision-making, and codified planning disciplines. It is applied in the present research to explore the internal environment of the contracting firms, i.e.,

whether or not a governance structure such as performance monitoring, risk assessment processes, and controls exists. Poorly functioning governance structures establish reactive management practices and poor schedule control.

By combining the above-stated theoretical foundations, the research formulates an integrated foundation for cause analysis of the delays in project schedules. Each theory offers a distinct perspective under which it examines human behaviour, organisational fit, system limits, and institutional forces. The integrating conceptual framework allows the derivation of pragmatic, evidence-based solutions for enhancing project delivery performance in Jeddah and other urban environments.



CHAPTER 3



Introduction

This chapter is a description of the methodology that has been used to explore the reason behind project delays in terms of schedule in construction and infrastructure projects in the city of Jeddah, Saudi Arabia. This chapter aims to report on the way the research was conducted, data collected and analysed to respond to the objectives of the study, along with answering the research questions.

The situation with project delays is quite complex and multidimensional, as it can often be caused by human actions, practices developed within an organisation, and system-related factors, and the qualitative research approach was selected. This methodology is more appropriate when it comes to investigating detailed knowledge and revealing background issues that can not be properly measured by adopting a quantitative research strategy. In a bid to supplement the qualitative analysis, some selected quantitative indicators have also been used to substantiate the findings and strengthen the trend observed.

In the chapter, the research design, the research community, sample, and some characteristics of the sample, as well as data collection and analysis methods, were enumerated. It also covers the scope and limitations of the study, which makes the study transparent. Lastly, it describes the way the statistical analysis is set to be performed in order to confirm the qualitative policies with quantitative pointers.

Research Design

The research design gives a general outline and a systematic pattern of carrying out the investigation, where the research questions and objectives of the study are answered in a methodical manner. Since the research problem concerns knowing about the behavioural patterns, organisational deficiencies and project management issues as a system, it has been decided to utilise the qualitative research design, corroborated by a limited amount of quantitative data. This research study is based on a descriptive and exploratory design whereby the aim of the study is to create a description, interpretation and explanation of the real situation that caused project schedule delays in construction and infrastructure development in the Jeddah region. Descriptive design covers the description of current conditions and trends concerning delay, whereas the exploratory dimension aims at finding the aspects that have previously been little studied.

The case study method was incorporated to offer an in-depth coverage of real-life project settings. The model is a good fit in the investigation of complicated, multilayered organisational environments, which can be evidenced in extensive projects which involve many stakeholders, subcontractors, and government organisations. Use of the case study method enabled the researcher to access the documents, project records and performance information to identify the common causes of delays.

The research study focuses on contextual knowledge, rather than coming up with a general statistical picture, which is well acquainted with qualitative research. It is aimed at drawing some findings and suggestions based on the available documentation, schedule, and project history of the sampling construction and infrastructure projects in Jeddah.

Overall, the chosen research design supports a rich, holistic exploration of project delay causes, aligned with the study's objective to propose actionable improvements in governance, planning, and execution practices.

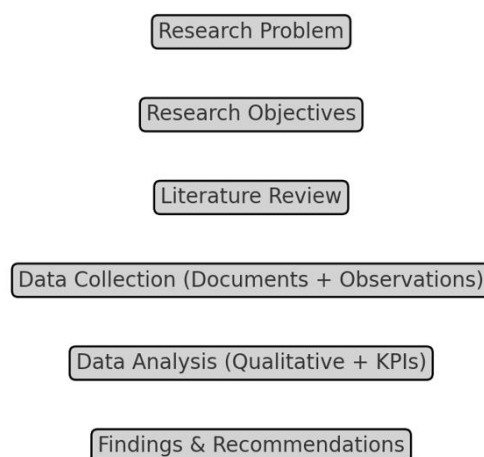


Figure 2 Research Design Flowchart

Research Community

The research community refers to the broader group from which data, insights, and perspectives are drawn to support the study. In this research, the community consists of individuals and organizations involved in the planning, management, and execution of construction and infrastructure projects within the city of Jeddah, Saudi Arabia. This includes stakeholders with direct influence over project scheduling, planning decisions, and execution performance.

The research community is composed of:

- Project Managers working in construction, infrastructure, or public service projects
- Contracting Companies, particularly main contractors and subcontractors involved in execution
- Consultants and Engineers responsible for project supervision, design coordination, and monitoring
- Clients or Project Owners, such as governmental entities or private developers
- Planners and Schedulers involved in baseline planning, tracking progress, and identifying deviations

Due to the study's qualitative nature and reliance on real-world documentation and observations, the focus was not on achieving a statistically representative sample but on gaining meaningful insights from a subset of the community. The selected participants or data sources reflect common challenges and organizational practices across similar projects in the Jeddah region.

This targeted approach ensures that the findings remain highly relevant to the specific industry context while also offering broader implications for other urban development projects within Saudi Arabia and similar environments.

Sample Characteristics

The sample in this study consists of a selected group of individuals and projects drawn from the broader research community involved in construction and infrastructure development in the city of Jeddah. The purpose of the sample is to provide relevant, context-specific insights into the causes of project schedule delays, based on real project experiences and documentation.

Since the research adopts a qualitative approach, the sample was selected purposively rather than randomly, with a focus on participants and documents that could provide the most relevant and rich information. The sample includes:

- Project managers and engineers involved in project execution and planning
- Contracting firms with direct responsibility for project delivery
- Consulting engineers involved in project oversight
- Project schedules, progress reports, and related documentation from completed or ongoing projects in Jeddah

The selected sample shares the following key characteristics:

- Direct involvement in large- or medium-scale construction or infrastructure projects
- Experience dealing with project delays, schedule deviations, or coordination issues
- Representation from both public and private sector projects
- Knowledge of planning tools, governance processes, and stakeholder communication

The diversity of roles and organizations within the sample enhances the reliability of the findings and supports a multi-perspective analysis. This approach ensures that the study reflects a realistic picture of the challenges faced in managing project timelines in Jeddah's dynamic and fast-paced construction environment.

Sample Size Determination

In qualitative research, the goal is not to achieve statistical generalization but to gather deep, contextual, and meaningful insights. Therefore, sample size is determined based on the principle of information saturation, where additional data no longer yield new insights or themes. This study adopts a purposive sampling strategy, focusing on participants and project documentation that are most relevant to the research objectives.

The sample size was influenced by the following considerations:

Relevance to the research questions, particularly regarding schedule delays, planning practices, contractor performance, and internal governance

Availability of accurate and accessible project documentation, such as schedules, progress reports, and change orders

Expertise and role of participants, including project managers, consultants, engineers, and planners involved in real-world projects in Jeddah

Time and resource limitations, which required focusing on a manageable number of sources while ensuring data richness and diversity

Given these factors, the study reviewed several project documents from 3 to 5 major projects in Jeddah and drew informal insights from professionals with direct experience in managing project schedules and dealing with delays. This sample size was considered sufficient to capture recurring patterns and conduct a robust thematic analysis.

The focus remained on the depth of information rather than quantity, in line with qualitative research standards. The selected sample enabled the researcher to explore key variables and validate findings against real project cases, thereby supporting the credibility and relevance of the study's conclusions.

Data Collection Procedures

The data collection procedures in this study were designed to obtain rich, detailed, and context-specific information related to the causes of project schedule delays. Since the research adopts a qualitative approach supported by selective quantitative indicators, the data were collected using multiple sources and methods to ensure credibility, depth, and triangulation.

The procedures followed a structured sequence:

- **Document Review**

The primary source of data involved reviewing official documents from selected construction and infrastructure projects in Jeddah. These included:

- Project baseline schedules
- Revised schedules and change orders
- Progress reports and delay notifications
- Meeting minutes, correspondence, and other planning-related documentation

These documents provided direct insight into planning practices, deviation patterns, and client–contractor interactions. The collected records were analyzed to identify recurring causes of delay and compare planned vs. actual timelines.

- **Observational Inputs**

Informal observational data were gathered from internal project meetings and site coordination discussions. These observations helped capture real-world behaviors, decision-making practices, and challenges that are not always evident in formal documentation.

- **Supporting Quantitative Indicators**

Where available, performance indicators such as baseline vs. actual completion dates, number of subcontracting layers, and schedule variance reports were used to support the qualitative findings and illustrate the scale of schedule delays.

- **Ethical Considerations and Access**

All data were collected with appropriate permissions and handled confidentially. No project or participant names were disclosed. The researcher ensured that all reviewed documents and observations complied with ethical guidelines for academic research.

Data were collected over a defined period and focused on 3 to 5 major projects in the city of Jeddah, selected for their relevance, scale, and visibility of planning and scheduling processes.

Study Scope and Limitations

Scope of the Study

This study investigates the root causes of project schedule delays within the Kingdom of Saudi Arabia, with a specific focus on projects executed in the city of Jeddah. It examines projects across multiple sectors—including construction, infrastructure, logistics, public services, and technology—reflecting the systemic nature of schedule delays that are not confined to a single industry.

The research explores both organizational and behavioral factors contributing to delays, with attention to the roles and interactions of clients, main contractors, and subcontractors. It emphasizes internal project governance, contractor qualifications, subcontracting structures, and client-imposed scheduling pressures. By analyzing real project documentation and applying multiple theoretical frameworks, the study aims to provide practical insights and recommendations to improve schedule performance.

Limitations of the Study

While the study offers meaningful findings, several limitations must be acknowledged:

- **Geographic Concentration**

The research is limited to projects based in Jeddah. Although the findings may offer insights applicable to other regions, they may not fully represent the conditions of smaller cities or rural areas in Saudi Arabia.

- **Sample Size and Access**

Due to confidentiality restrictions and time constraints, access to project documents and stakeholder input was limited. In some cases, the study relied on self-reported or indirectly obtained data, which may introduce bias or incomplete perspectives.

- **Qualitative Emphasis**

The research follows a qualitative approach supported by selected quantitative indicators. While this allows for in-depth exploration of patterns and themes, the results are not statistically generalizable.

- **Sector Representation**

Although the study is cross-sectoral in intent, the most robust data came from construction and logistics projects. Other sectors—such as IT, healthcare, and government services—were less represented due to limited access.

- **Time Constraints**

Project environments and regulatory frameworks evolve rapidly. The findings reflect the context at the time of research and may not fully capture more recent changes, reforms, or policy developments that occurred afterward.

Statistical Analysis Method

Although this research primarily adopts a qualitative approach, it incorporates selected quantitative indicators to support and validate the findings. The statistical analysis component focuses on descriptive techniques that help interpret performance data and highlight trends related to project schedule delays.

The statistical analysis was applied in the following areas:

- **Schedule Variance Analysis**

Baseline and actual completion dates from selected projects were compared to calculate schedule variances. These variances were used to quantify the extent of delays and correlate them with project factors such as contractor performance, subcontracting levels, and planning practices.

- **Frequency Counts and Percentages**

Where applicable, frequency data (e.g., number of delayed projects, frequency of specific delay causes) were used to identify recurring patterns. These helped to support qualitative themes and reinforce the significance of certain factors.

- **KPI Review**

Basic project Key Performance Indicators (KPIs), such as on-time delivery rate and number of change orders, were analyzed descriptively to identify correlations between schedule performance and internal governance practices.

Given the limited sample size and document-based nature of the data, inferential statistical methods (e.g., regression analysis, hypothesis testing) were not applied, as the study does not aim to generalize across a broad population but rather to explore in-depth patterns within a focused context. All quantitative findings were integrated with the qualitative analysis using a triangulation approach, allowing for a more robust interpretation of the results and ensuring alignment between numerical trends and observed behaviors.



CHAPTER 4



Data Analysis

This section presents the results of the practical investigation into the causes of schedule delays in construction and infrastructure projects in Jeddah, Saudi Arabia. The analysis focuses on both qualitative insights and selects quantitative indicators to explore the relationship between organisational behaviour, project management practices, and delay patterns.

The information was gathered using official project documents, including the baseline schedules, progress reports, change orders, observational notes, and informal stakeholder evaluations. Such sources were used to determine the frequency, intensity and the reasons behind the nature of delay, especially taking into consideration the predefined variables of the work.

The analysis was undertaken on a thematic basis in order to identify the common areas of concern, such as gaps in the qualification of contractors, complexities of subcontracting, unrealistic expectations on the side of the clients, and the lack of governance mechanisms internally. The quantitative component, i.e. schedule variance, the number of subcontracting levels was described and assessed to support the qualitative results.

Seeing that various data sources can be synthesised, this analysis will seek to give a rooted knowledge of the project delay dynamics and contribute to formulating viable indications to enhance schedule reliability in the subsequent projects.

Research Findings and Discussion

The research findings categorise some intrinsic and chronic factors leading to schedule delays in the construction and infrastructure projects of Jeddah. The comparative analysis of documentary data, project files, and expert observations clarifies evident agreement with the study hypotheses and validates the theoretical model that is being employed in this study.

- **Contractor Qualification and Capability**

There is a recurring trend to be found in the data, namely that contractor ability is a major factor in schedule compliance. Projects undertaken by contractors with weak in-house engineering capability, systematic planning systems, or systematic project governance tools were considerably more prone to overruns. In each of these cases, there was insufficient resource planning and risk forecasting and excessive dependence upon reactive decision-making, lending further support to the contention that unqualified contractor appointment is a root cause of schedule overruns.

- **Complexity in Subcontracting**

The findings show that sophisticated subcontracting structures have a cascading level of activities and flows between prime contractors, subcontractors, and sub-subcontractors. The sophisticated structures have a tendency to cause coordination failures, diminished accountability, and fragmented communication channels in most projects. The findings validate the argument that there are excessive levels of subcontracting that cover up responsibility and make projects vulnerable to delays unless planned, regulated, and monitored.

- **Unrealistic Schedules Imposed by Clients**

A number of the cases brought forth in this paper demonstrated that politically driven clients or internal schedules established unrealistic schedules placed undue pressure on contractors in planning and mobilisation stages. Contractors admitted to accepting such unrealistic schedules to get contracts, even though they knew the schedules were not realistic. In other situations, project timelines were set intentionally to accommodate client expectations, providing empirical evidence for Agency Theory and confirming that conflicting incentives and information asymmetry have a negative impact on project delivery.

- **Lack of Internal Governance**

Across several case studies, the lack of internal governance frameworks within contracting firms was evident. Organisations that lacked standardised planning procedures, schedule review checkpoints, or performance monitoring tools were more likely to deviate from baseline timelines. This observation confirms the hypothesis that weak internal controls and governance structures negatively affect schedule adherence.

- **Integrated Discussion with Theoretical Framework**

The findings validate the applicability of the study's theoretical foundations.

- Agency Theory explains how the divergence between client and contractor interests, combined with asymmetric information, leads to unrealistic commitments.
- Systems Theory illustrates how failure in one project component—such as communication with subcontractors—can disrupt the entire schedule
- Theory of Constraints is relevant in identifying critical limitations (e.g., unqualified teams or bottlenecked resources) that restrict performance.
- Institutional Theory helps explain the cultural and political pressures that normalize unrealistic planning practices across the industry.

- **Practical Implications**

The findings underscore the importance of contractor prequalification, improved project governance, and early-stage stakeholder alignment. Clear communication, realistic timelines, and strong internal systems are essential to improving schedule performance and reducing delivery risks in large-scale projects.

Research Recommendations

Based on the findings of this study, several key recommendations are proposed to mitigate schedule delays and enhance the effectiveness of project delivery in construction and infrastructure projects, particularly within the context of Jeddah and similar urban environments in Saudi Arabia:

- **Strengthen Contractor Prequalification Standards**

Government agencies and private developers must have more stringent prequalification standards when they select prime contractors. These standards need to challenge not just financial capacity but technical capacity, planning tools, and in-house management structures. These contractors ought not to be assigned large or complicated contracts if they fail to meet these standards.

- **Limit Multi-layered Subcontracting Arrangements**

Major contractors are required to declare the whole subcontract chain at the time of project initiation. In order to bridge responsibility gaps, customers ought to limit over-dependency on serial layers of subcontracting. Policy in support of direct and more integrated teams can contribute strongly to delivery results.

- **Adopt Realistic and Team-Oriented Scheduling Practices**

More cooperative project scheduling must be adopted by customers. Schedules must be based on realistic resource capability, design intricacy, and rigorous risk analysis, rather than political or arbitrary deadlines. Early contractor involvement in planning can influence realistic schedules and mutual milestones.

- **Institutionalize Internal Project Governance Systems**

Contracting companies must develop effective internal controls, such as review processes for schedules, performance tool monitoring, including earned value management, and clearly defined control processes. It should have a prevalent culture of responsible planning and accountability within the company.

- **Increase Transparency and Accountability**

In order to avoid deceptive reporting of progress, clients and contractors would use open-monitoring tools. Electronic dashboards, third-party audits, and simultaneous checks against progress are able to enhance transparency as well as induce honest status reports.

- **Encourage Capacity Building and Professional Development**

All the stakeholders involved in the project must ensure continuous training in project scheduling, risk analysis, and control systems for their personnel. Human capital development must play a role in enhancing levels of execution in the industry.

- **Foster Regulatory Overseeing and Industry Benchmarking**

Institutional organisations such as the Saudi Contractors Authority or the concerned ministries should develop benchmarking metrics and implement regulations to maintain industry-best practice with regard to scheduling.

- **Implement Pilot Schemes to Test Best Practice**

Customers are able to pilot new governance, scheduling, or procurement approaches on small-scale projects in a bid to assess their impacts before upscaling. This elastic approach can be used to build confidence and reduce resistance to systemic change.

Appendixes

المخلص

صناعة الإنشاءات والبنية التحتية في المملكة العربية السعودية لا تزال تواجه تحديات كبيرة فيما يتعلق بتأخر المشاريع، خاصة في المدن الحضرية سريعة النمو مثل جدة. وتنعكس هذه الخسائر سلباً على تكاليف المشروع وجودته ورضا أصحاب المصلحة، كما أن هناك احتمالية كبيرة لأن تؤثر هذه التأخيرات على نجاح المشروع بالكامل. ويُعد التأخير النسبي في التنفيذ والتسليم موضوعاً مقلقاً أيضاً، نظراً لاستمراره بالرغم من الزخم الكبير في مشاريع التوسع العمراني والإنفاق الواسع على البنية التحتية في المملكة.

تهدف هذه الدراسة إلى تقديم رؤى حول العوامل المسببة لتجاوز الجدول الزمني في المشاريع الكبرى التي تم تنفيذها في مدينة جدة خلال السنوات القليلة الماضية. وتركز الدراسة على تحديد الأسباب الإدارية والفنية والتعاقدية التي تؤدي إلى هذه التأخيرات. وقد اعتمدت الدراسة على منهج بحثي مختلط شمل مقابلات مع مديري مشاريع ومستشارين ومهندسين، بالإضافة إلى استبيانات منظمة بهدف استكشاف الأسباب الكامنة وراء مشكلات الجدولة غير الفعالة وغير القابلة للسيطرة.

تشير نتائج البحث إلى أن السبب الرئيسي في التأخيرات يعود إلى إسناد العقود إلى مقاولين غير مؤهلين، مما يؤدي إلى ضعف التنسيق في الأعمال، والاعتماد المفرط على المقاولين من الباطن، وتشتت المسؤوليات. وتتفاقم هذه المشكلات بسبب التأخيرات في الموافقات، وسوء التخطيط، والتحديات اللوجستية، والتغييرات المتكررة في التصميم أو نطاق العمل خلال مرحلة التنفيذ. وبناءً على ذلك، تقدم الدراسة الحالية توصيات تطبيقية لدعم حوكمة المشاريع، وتحسين معايير اختيار المقاولين، وتطبيق أدوات مراقبة المشاريع في الوقت الفعلي، وذلك بهدف تسهيل تسليم المشاريع المستقبلية في الوقت المحدد.

Abstract

Construction and the infrastructure industry in Saudi Arabia have remained a problem area concerning delayed projects, particularly in fast-growing urban cities such as Jeddah. Such losses are negatively reflected in the project costs, quality, and stakeholder satisfaction, and there is a high chance of compromising the success of the entire project. The relative delay in terms of executions and handover is also a topic of concern because it is still a common problem despite the vigorous urbanisation, as well as extensive spending on infrastructure in the country.

This study develops insights into the causative factors of schedule overruns in major projects that have been executed in Jeddah over the last couple of years. The objective of the study is to identify administrative, technical and contractual causes of such delays. The study employed a mixed-methods research design, such as interviews of project managers, consultants, and engineers, as well as structured surveys to explore the underlying causes of ineffective and uncontrollable scheduling issues.

Research results show that the major cause of delays rests in contracts given to unqualified contractors, this leads to poor coordination of the work, excessive dependence on subcontractors, and accountability. These are coupled by late approvals, poor planning, logistical challenges and numerous design or scope changes in the implementation stage. To this end, the current study presents applied recommendations on supporting project governance, enhancing the standards of contractor selection, and introducing real-time project-monitoring tools (which would be used to facilitate on-time delivery of future projects).

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