

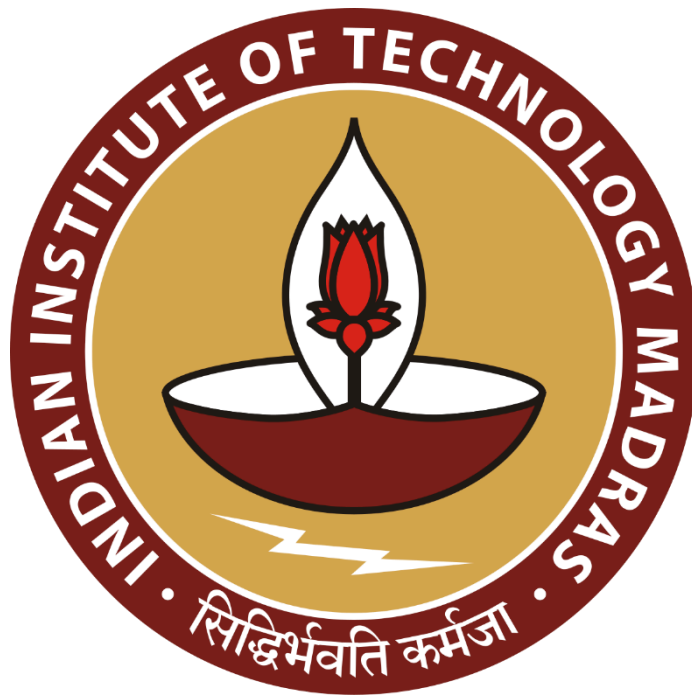
# **Streamlining Project Deadlines and Resource Allocation in a Competitive Construction Market**

**A Proposal report for the BDM capstone Project**

Submitted by

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## **Declaration Statement**

I am working on a Project titled “Streamlining Project Deadlines and Resource Allocation in a Competitive Construction Market”. I extend my appreciation to **Mohra Limited Company**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the principles of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I understand that all recommendations made in this project report are within the context of the academic project taken up towards course fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.



Signature of Candidate.

Name: Eram Nishat

Date: October 5, 2024

# **1. Executive Summary**

This report provides a comprehensive analysis of the key challenges and opportunities facing Mohra Construction Company, offering data-driven recommendations to enhance project management, client relationships, and market competitiveness.

Mohra Construction is a prominent player in the general construction sector, offering services ranging from hotel and restaurant development to villa construction and petrol station projects. Despite a strong portfolio, the company faces two major hurdles: managing project deadlines effectively and staying competitive in a dynamic market. The company's reliance on both internal resources and subcontractors, coupled with fluctuating site conditions, often results in delays that impact project timelines and client satisfaction. Additionally, intense competition and unpredictable market demand make it difficult for Mohra to secure a steady stream of contracts. Despite these challenges, the company maintains solid relationships with clients, which presents a valuable opportunity for growth and expansion into larger projects.

The primary objectives of this analysis are to identify strategies to reduce project delays, enhance market competitiveness, and strengthen client retention. To achieve these goals, the report focuses on optimizing project management processes and leveraging client data to build stronger, more strategic relationships. By addressing inefficiencies in project execution and improving resource allocation, Mohra can reduce delays and enhance its market position.

The approach adopted in this report includes both quantitative and qualitative methods. A thorough analysis of project timelines, client contributions, and resource usage will be conducted using tools such as Power BI for real-time data visualization and Python for predictive modeling. Qualitative insights will be gathered through client feedback and internal team interviews to identify pain points and opportunities for improvement. Data collection will focus on past project performance, client revenue contributions, and employee resource allocation, providing a holistic view of the company's operations. These insights will inform recommendations on how to better market high-value services, streamline project management processes, and develop loyalty programs for repeat clients.

Ultimately, this project aims to deliver actionable insights that will help Mohra Construction improve operational efficiency, secure more large-scale projects, and build stronger client relationships. By focusing on high-value contracts and consistent services, while offering personalized deals to key clients, the company can enhance both its profitability and market share in the competitive construction industry.

# **2. Organization Background**

Mohra Company Limited, founded in 2012 and based in Riyadh, Saudi Arabia, has steadily grown into a trusted name in the construction industry. Specializing in a wide array of

projects, the company handles everything from residential renovations to large-scale commercial endeavors, including hospital fit-outs, ISO panel cutting, and office refurbishments. Over the years, Mohra has built a solid reputation for delivering high-quality work on time, forming lasting relationships with clients across various sectors. Its commitment to excellence is evident in its ability to tackle projects of varying complexity while maintaining a focus on quality and timely delivery.

With a team of 18 employees and an annual budget of SAR 150,000, Mohra operates in the B2B (business-to-business) sector, ensuring that every project, regardless of scale, is handled with the utmost professionalism and attention to detail. The company prioritizes compliance with industry standards, regularly engaging civil quality control inspectors to guarantee that all work meets rigorous specifications. Looking to the future, Mohra aims to expand its reach undertaking larger projects and actively exploring opportunities in the real estate business.

#### Mission Statement

To provide high-quality construction and repair services that meet the unique needs of our clients, ensuring satisfaction and long-term value.

#### Vision

To be a leading construction company known for our commitment to quality, innovation, and customer satisfaction.

#### Core Values

- Quality: Delivering superior craftsmanship in every project.
- Integrity: Maintaining honesty and transparency with clients.
- Customer Satisfaction: Ensuring every client is happy with our work.
- Innovation: Continuously improving our methods and services.

## **3. Problem Statement**

### **3.1 Problem Statement 1**

#### Market Competition:

- Mohra faces increasing competition from larger construction firms with more resources, making it difficult to secure high-value contracts.
- Limited market visibility in high-growth segments like real estate and commercial construction, resulting in fewer opportunities for expansion.

### **3.2 Problem Statement 2**

Project Deadlines:

- Difficulty in meeting tight project deadlines with limited manpower, while maintaining high-quality standards, leading to delays or cost overruns.
- Inefficient project scheduling and resource allocation, causing bottlenecks and slowing down overall project execution.

### **Relevance**

Improving operational efficiency and client retention strategies is crucial for Mohra to remain competitive and expand its project portfolio. Data analysis from financial reports and project records will reveal patterns in client contributions and service profitability. Addressing these challenges will enable Mohra to secure higher-value projects, strengthen client loyalty, and streamline operations for future growth.

### **Objectives**

Objective 1: Identify ways to reduce project delays and improve deadline management.

Objective 2: Enhance market competitiveness by identifying high-value, repeat clients and better resource allocation.

Objective 3: Strengthen client relationships and develop strategies for customer retention.

## **4. Background of the Problem**

The company's focus on delivering quality work and timely completion has built a strong client base, including high-profile clients like New Rabwa Real Estate and United National Electromechanical. However, with increasing competition from larger firms, Mohra Construction Company faces two significant challenges: market competition and project deadlines. The construction industry is highly competitive, with numerous firms bidding for the same projects, driving the need for strategic client relationships and competitive pricing. This intense competition sometimes leads Mohra to lose out on lucrative projects, even though the company maintains a strong portfolio of completed works. Relationships with clients, the availability of financing, and efficient project execution play key roles in determining which projects are secured. Despite these relationships, fluctuating market

demands and the entry of new competitors have further strained the company's ability to consistently win contracts.

In addition to market competition, Mohra faces internal challenges with project deadlines. Managing multiple construction sites concurrently often strains resources, both in terms of labor and materials. While some projects are handled internally, the company frequently hires subcontractors for specialized tasks when the workload exceeds internal capacity. This reliance on external contractors can introduce variability in project timelines. Additionally, the company's existing project management system, which involves daily progress tracking, may not be robust enough to ensure all milestones are met consistently. Delays often arise due to unpredictable site conditions or resource availability, further complicating project schedules. Ensuring the timely completion of projects, while maintaining high quality, has become a recurring issue for Mohra, which directly affects client satisfaction and market position.

## **5. Problem Solving Approach**

### **5.1 Details about the Methods Used with Justification:**

To gain a deeper understanding of the construction business and develop a more effective approach to problem-solving, I spent around 20 days learning key concepts such as quality control, cash flow management, competition, and other core metrics. My learning resources included the Principles of Construction Management course by Prof. Sudhir Misra from IIT Kanpur, and a course on Construction Business Management by Tom Stephenson.

Given the challenges Mohra Construction faces, including project delays and intense market competition, I will adopt a data-driven approach combining both quantitative and qualitative methods.

a) **Descriptive Statistics:** To provide an overview of project performance and client contributions, I will calculate summary statistics (e.g., mean, median, standard deviation) for metrics such as project duration, revenue, and completion rates. This will help to identify baseline performance indicators.

b) **Trend Analysis:** This will allow us to spot patterns in project timelines and market competition across different months, helping to predict future delays or resource bottlenecks. Using time-series data from past projects, we can assess which months face the most delays or competition, allowing Mohra to better prepare for peak periods.

c) **Benchmarking:** Comparing Mohra's performance (in terms of project timelines and client satisfaction) with industry standards will allow us to set realistic benchmarks for improvement. By doing this, we can see how far Mohra lags behind competitors and identify areas where the company can improve to stay competitive.

d) Client Feedback Analysis: Gathering insights from clients through surveys or interviews will help understand their expectations and satisfaction levels. This is crucial because client retention is often a key determinant of success in the competitive construction industry.

e) Team Feedback: Engaging with Mohra's internal team, especially project managers and on-site workers, will provide insights into recurring issues that cause delays, such as resource shortages or miscommunication.

## **5.2 Details about the Intended Data Collection with Justification:**

### **1. Project Data:**

I will request data on all past projects, including start and end dates, project types (e.g., villa renovations, hospital constructions), subcontractor usage, and client details. Collecting this data is crucial for understanding the operational side of Mohra's business and identifying where delays typically occur.

### **2. Client Data:**

Collecting data on clients (e.g., project size, total revenue contribution, repeat business) will help in identifying the most profitable and loyal clients. This will allow Mohra to focus its efforts on maintaining and growing relationships with key clients, thus improving market position.

### **3. Employee Data:**

Data on resource allocation, particularly manpower (internal team vs. subcontractors), will be collected. This is essential for understanding whether delays are caused by insufficient workforce or subcontractor inefficiencies, enabling better planning for future projects.

### **Justification:**

This data collection is necessary for understanding Mohra's operations, identifying bottlenecks, and improving both efficiency and client relationships. Without this data, we cannot pinpoint the sources of delays or the factors contributing to competitive pressures.

## **5.3 Details about the Analysis Tools with Justification:**

### **1. Python (Pandas, Seaborn):**

Python will be used for advanced data manipulation and visualization. With libraries like Pandas and Seaborn, I can handle large datasets, perform deep analysis (e.g., regression modeling), and generate insightful visualizations. Python will also be used to create predictive models that estimate the likelihood of project delays based on historical data.

### **2. Excel:**



For preliminary data processing and analysis, Excel will be used. It's efficient for handling smaller datasets and performing quick calculations, particularly during the data cleaning and initial exploration phases.

### 3. Power BI / Tableau:

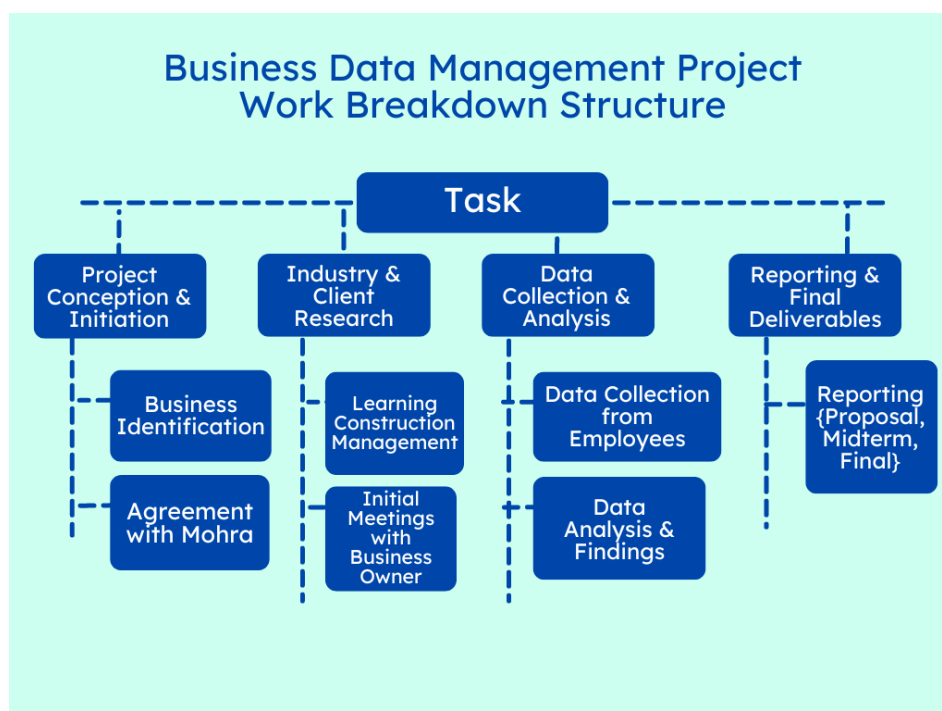
These tools will be used to visualize key metrics such as project completion rates, revenue contribution by client, and project timelines. By using visual dashboards, Mohra's management team will be able to easily track progress and identify problem areas. These tools offer real-time reporting capabilities, making them ideal for dynamic project environments.

Justification:

Power BI and Tableau are ideal for real-time visualization, giving the management team quick insights into ongoing project performance. Python offers the flexibility to handle complex data analysis and predictive modeling, while Excel is sufficient for initial data cleaning and straightforward calculations. Together, these tools will provide a comprehensive and efficient approach to solving Mohra's challenges.

## 6. Expected Timeline

### 6.1 Work Breakdown Structure



## 6.2 Gantt chart

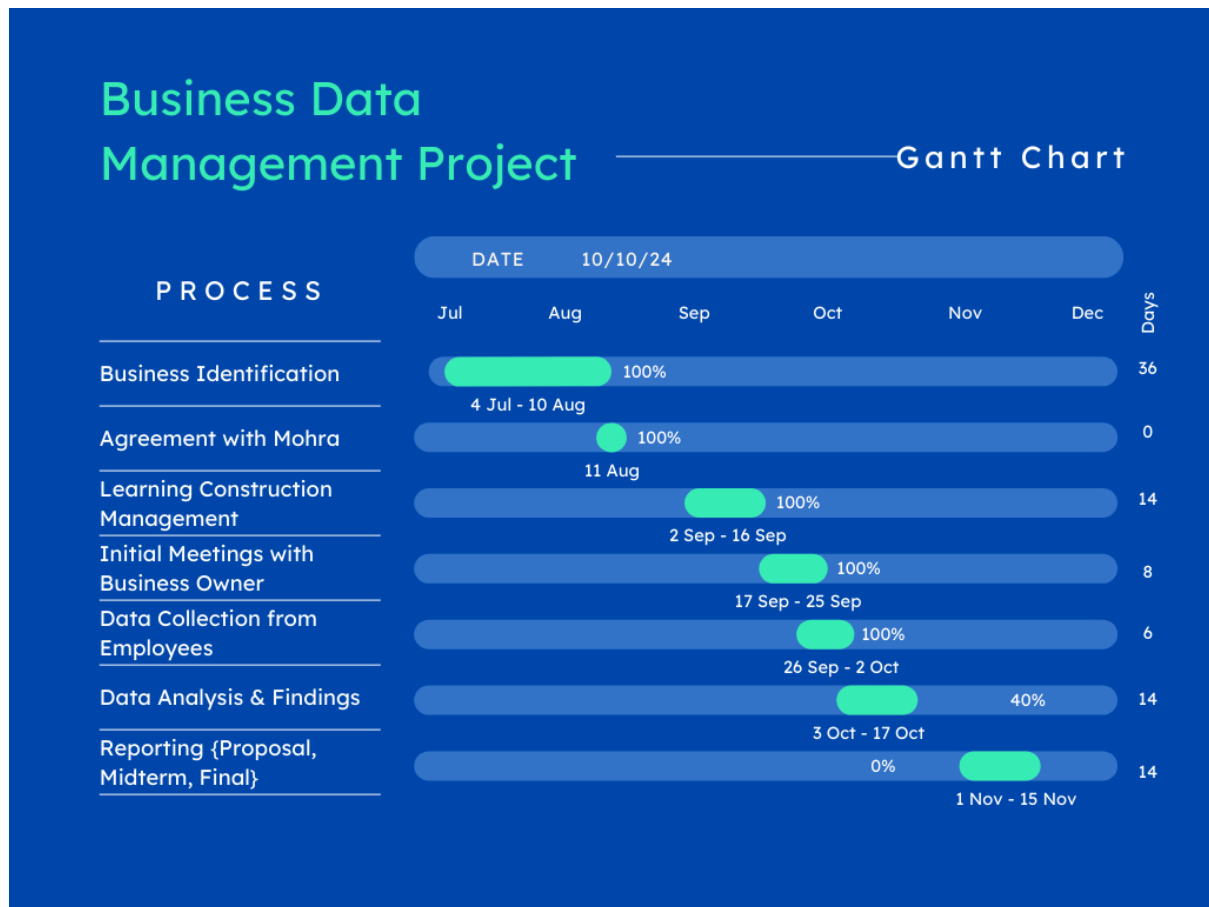


Figure 1: Expected timeline for completion of project

## 7. Expected Outcome

This project is expected to deliver comprehensive insights derived from the company's data, focusing on several key areas.

**7.1** Client analysis will identify the most important clients based on their revenue contribution, enabling the company to prioritize resources and build stronger relationships with high-value clients.

**7.2** Project trends will highlight the most profitable types of services, such as villa renovations or hospital construction work, allowing Mohra Construction to strategically focus on the most lucrative opportunities.

**7.3** Efficiency metrics will provide insights into how project management can be improved to consistently meet deadlines and cost targets.

These insights will offer recommendations that will enhance operational efficiency, strengthen customer relationships, and support more informed decision-making processes for future projects and investments.