

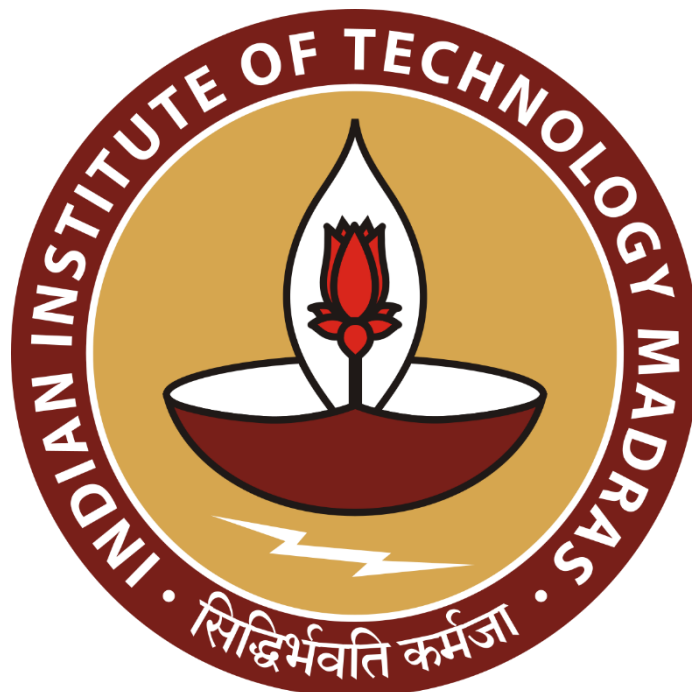
# **Case Study for VP Fire System Private Limited**

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

Submitted by

Name: Pragya Tripathi

Roll number: 23f1001699



IITM Online BS Degree Program,  
Indian Institute of Technology, Madras, Chennai  
Tamil Nadu, India, 600036

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## Declaration Statement

I am working on a Project titled “Case Study for VP Fire System Private Limited”. I extend my appreciation to VP, 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: Pragya Tripathi

Date: 03-03-2025

# **1 Executive Summary and Title**

VP Fire System Private Limited, established in 2018, is a Delhi-based Private Limited Company specializing in advanced fire and security solutions for residential, commercial, and industrial spaces. The company offers customized installation, commissioning, and maintenance services, collaborating with various industry professionals.

The company faces three primary challenges: difficulty in accurately forecasting seasonal demand fluctuations, particularly during festive periods; lack of comprehensive customer base understanding, leading to ineffective targeting and marketing strategies; and limited visibility and recognition in lucrative market segments such as hotels and hospitals as a new market entrant.

To address these issues, a comprehensive approach utilizing sales forecasting and customer segmentation techniques is proposed. This will involve analyzing historical sales data, implementing time series forecasting methods, and employing clustering algorithms for customer segmentation. The analysis will be conducted using Excel and Python, leveraging tools such as pivot tables, statistical libraries, and machine learning algorithms.

The expected outcome is to improve demand prediction accuracy, enhance targeted marketing efforts, and ultimately increase the company's market presence and profitability.

## **2 Organization Background**

Name: VP Fire System Private Limited

Owner: Kapil Kumar

Address: 328-329, 3rd Floor, Vardhman Star Citi Mall, Sector-7, Dwarka, New Delhi, 110075

VP Fire System Private Limited, established on November 22, 2018, is a leading B2B provider of fire and security solutions. Headquartered in Delhi, the company specializes in designing, installing, and commissioning advanced safety systems that meet stringent industry standards. It works closely with PMCs, architects, consultants, and OEMs to deliver customized security solutions for commercial and industrial spaces. While primarily B2B, the company also serves select individual clients. In addition to installation, VP Fire System Private Limited provides maintenance services and regular training sessions to ensure system efficiency and compliance. Focused on innovation and reliability, the company continues to expand its reach across various sectors with cost-effective, high-quality security solutions.

### 3 Problem Statement

Based on the discussion and analysis of VP Fire System Private Limited's situation, the following problem statements can be identified:

**3.1 Forecasting Seasonal Demand:** The company struggles to accurately forecast seasonal demand fluctuations, especially during festive periods like November, when manpower and inventory shortages lead to potential lost sales opportunities.

**3.2 Customer Base Understanding:** Lacking comprehensive customer base understanding, the company's ineffective targeting and marketing strategies hinder tailored offerings and communications to specific customer groups, potentially missing sales and loyalty opportunities across market segments.

**3.3 Market Visibility:** As a new market entrant, VP Fire and Security System lacks visibility and recognition, particularly in lucrative segments such as hotels and hospitals.

### 4 Background of the Problem

VP Fire System Private Limited, established in 2018, faces significant challenges in a highly competitive market dominated by industry giants like Siemens and Honeywell, as well as numerous smaller competitors. The company's primary goal is to increase profitability, but it struggles with several internal and external factors.

Internally, the company faces a critical manpower shortage, particularly during holiday seasons like November, leading to reduced sales and operational capacity. Issues of less inventory are also there leading to inability to meet customer demands.

Externally, the company contends with market downturns, especially towards year-end, and intense competition. These issues collectively impact VP's ability to accurately forecast sales, effectively segment customers, optimize inventory, and implement targeted marketing strategies. The lack of a strong market profile further compounds these challenges, making it difficult for VP to differentiate itself and capture market share.

## 5 Problem Solving Approach

To address the challenges of market volatility and fierce competition faced by VP Fire System Private Limited, a comprehensive approach focusing on improving sales forecasting and enhancing customer segmentation is proposed. This approach aims to develop targeted marketing strategies to establish a stronger market position and drive sustainable growth. The following detailed plan outlines the methods, data collection, and analysis tools justified for each aspect:

### **Detail about method used with justification**

- Sales Forecasting:

Historical sales data will be utilized, employing time series analysis techniques to forecast future sales accurately. This approach will help VP predict demand patterns, identify seasonal trends, and make informed decisions about inventory and resource allocation

- Customer Segmentation:

Customer data will be analyzed to identify distinct groups based on purchasing behavior, preferences, and value to the company. This segmentation will enable VP to tailor marketing efforts, improve customer retention strategies, and optimize product offerings for specific customer groups.

### **Detail about intended data collection with justification**

Effective data collection is vital for sales forecasting and customer segmentation. Key factors from purchase and sales data include Date, Product/Service details, Buyer/Supplier info, Quantity, Rate, Value, and Gross Total.

From these, essential insights will be derived, such as time-based sales trends, product-specific performance, and customer purchase patterns. Additionally, RFM (Recency, Frequency, Monetary) analysis will be implemented by calculating:

- **Recency:** Time since the last purchase
- **Frequency:** Purchase frequency
- **Monetary Value:** Total purchase value

These metrics enable data-driven decision-making and strategic customer segmentation.

### **Detail about Data analysis with justification**

For sales forecasting and customer segmentation, Excel and Python will be primarily used for data processing and analysis. The tools being used for the entire analysis are:

#### **Sales Forecasting:**

##### 1. Excel:

- PivotTables for summarizing and analyzing time series data
- Time series decomposition using moving averages
- Built-in functions for trend analysis (e.g., TREND)
- Data visualization tools like line charts and scatter plots

Justification: Excel provides a user-friendly interface for basic time series analysis and visualization, making it accessible for initial data exploration and simple forecasting tasks.

##### 2. Python libraries:

- Statsmodels for time series decomposition and ARIMA/SARIMA/Prophet models
- Scikit-learn for implementing machine learning models like Random Forest
- Matplotlib and Seaborn for advanced data visualization

Justification: Python libraries offer more advanced capabilities for time series analysis, allowing for complex modeling and forecasting techniques that can capture intricate patterns in sales data.

#### **Customer Segmentation:**

##### 1. Excel:

- PivotTables for data aggregation and initial segmentation
- Basic clustering using Excel formulas and conditional formatting
- Data visualization tools like scatter plots and bar charts

Justification: Excel is useful for initial data exploration and simple segmentation tasks, providing a quick overview of customer groups.

## 2. Python libraries:

- Scikit-learn for implementing K-means clustering
- Pandas for data manipulation and RFM analysis
- Matplotlib and Seaborn for creating advanced visualizations like dendrograms and heatmaps

Justification: Python libraries offer more sophisticated clustering algorithms and visualization techniques, allowing for more nuanced and data-driven customer segmentation.

## 6 Expected Timeline

### 6.1 Work Breakdown Structure:

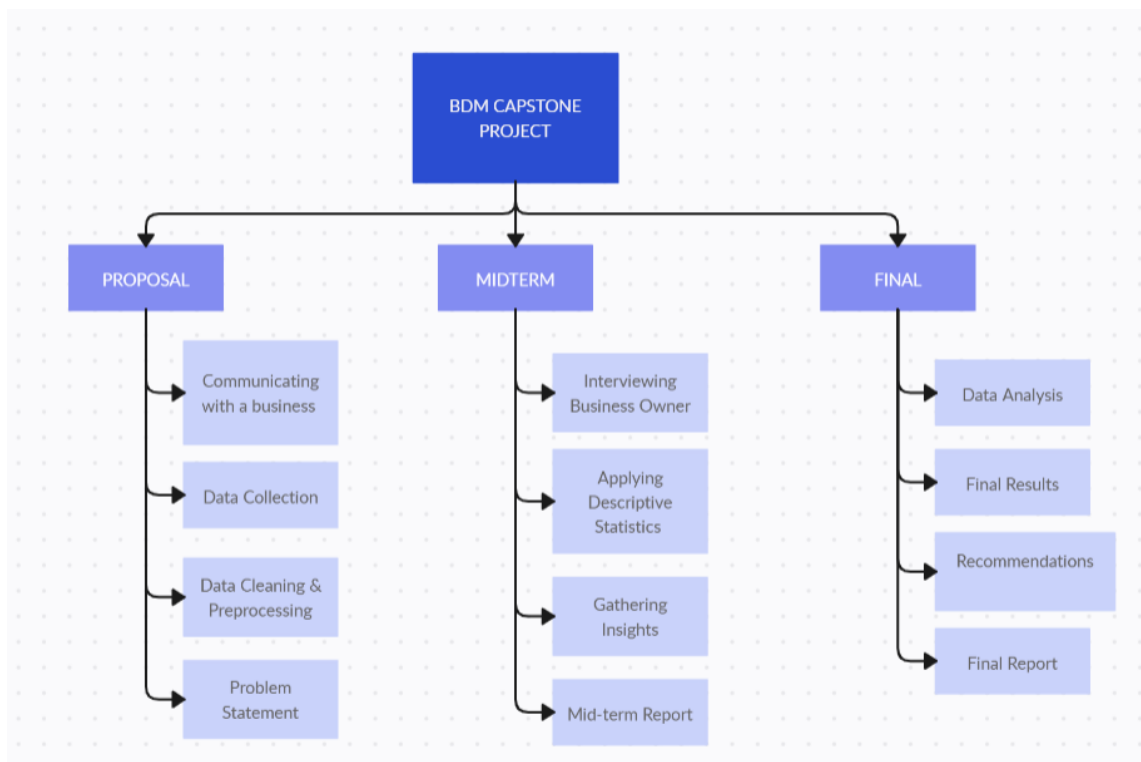


Figure 1: Work Breakdown Structure



## 6.2 Gantt chart

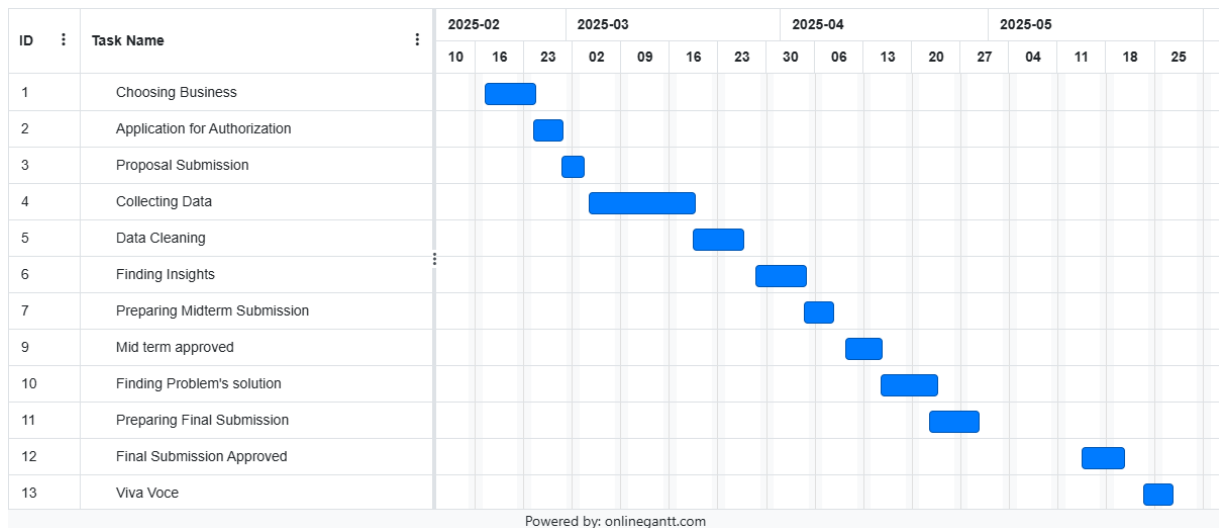


Figure 2: Gantt Chart

## 7 Expected Outcome

### 7.1 Accurate Sales Forecasting:

- Improved revenue prediction accuracy, enabling better financial planning
- Enhanced ability to identify and respond to sales trends and fluctuations
- More effective resource allocation and budgeting across business areas

### 7.2 Enhanced Customer Segmentation:

- Deeper understanding of customer preferences and behaviors in the fire and security system market
- Ability to tailor marketing efforts and product offerings to specific customer segments
- More efficient allocation of marketing resources to high-potential segments

### 7.3 Targeted Marketing Strategy:

- Increased market share in high-potential segments like hotels and hospitals
- More effective communication of the company's value proposition
- Enhanced market presence and increased foothold in the local business landscape