Sales Pattern Analysis and Operational Bottlenecks in a Dine-In Restaurant Using POS Data

A Proposal report for the BDM capstone Project

Submitted by:

Name:Vaibhav Soni

Student Email: 23f2004675@ds.study.iitm.ac.in

Roll number: 23f2004675

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 "**Sales Pattern Analysis and Operational Bottlenecks in a Dine-In Restaurant Using POS Data**". I extend my appreciation to **The Royale Place**, for providing the necessary resources that enabled me to conduct my project.

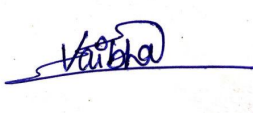
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

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 information 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 agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.



Signature of Candidate
Name: Vaibhav Soni
Date: 12th July, 2025

1. Executive Summary and Title

The project focuses on a medium-sized restaurant, **The Royale Place**, located at Kolkata, West Bengal. Offering a broad range of vegetarian multicuisine dishes with a focus on Jain dietary needs and fresh daily catering, the business is B2C and operates in the food and beverage sector.

The main problems the restaurant is facing are that it doesn't get many online orders and it doesn't really have a clear picture of how its sales change week to week, what times of day are the busiest, or which types of food are doing well or not. Because of that, it's hard for them to plan things like staffing, manage their menu, or respond to what customers actually want.

To tackle these issues, the project will look at three months of POS and master data using simple analytical tools. We'll examine how each menu item is performing, identify the busiest times of the day, and see which dishes are popular and which ones aren't doing so well.

2. Organization Background

The Royale Place is a 100% pure vegetarian, multicuisine restaurant located in Bhawanipur, Kolkata. Known for its authentic food offerings and adherence to Jain dietary preferences.

The restaurant places a strong emphasis on fresh daily catering and customer satisfaction. It caters to a wide variety of customers in a family-friendly setting, offering a diverse menu that blends tradition with modern tastes. The establishment is fully air-conditioned, well-maintained for hygiene, and consistently upholds high standards of cleanliness to ensure a comfortable dining experience.

Picture 1-Front side of The Royale Place

3. Problem Statement

The business problems that could be identified from the discussion are as follows:

3.1. Low Online Sales Volume:

Despite strong dine-in performance, the restaurant receives very few online orders. This gap in digital customer reach affects total revenue and market expansion.

3.2. Lack of Sales Pattern Visibility and Inadequate Staffing

The restaurant doesn't have a clear view of weekly sales trends, peak hours, or how different categories are performing. Because of this, it becomes difficult to plan ahead or forecast demand accurately. As a result, they often end up short-staffed during busy hours, which affects the quality of service and leads to lower customer satisfaction.

4. Background of the Problem

During discussions with the owner of The Royale Place, two critical issues were identified: low online order volume and lack of weekly sales trend visibility. Though these issues may seem separate, they're actually connected and are leading to inefficiencies in daily operations as well as missed opportunities for growth.

The restaurant consistently attracts dine-in customers, but the online ordering channel hasn't been fully explored. This is mainly because of a limited presence on food delivery platforms and the lack of a targeted digital marketing strategy. In today's competitive marke, where convenience and online visibility play a major role in customer decision, this significantly limits the restaurant's ability to reach new customers and grow.

On the internal side, the restaurant lacks visibility into weekly sales patterns, peak hours, and category-wise performance, resulting in ineffective staff scheduling. During peak times, the restaurant often experiences staff shortages, leading to delayed service and reduced customer satisfaction. Additionally, category-level sales insights are not leveraged, which restricts the ability to improve menu offerings and pricing decisions.

Addressing these internal and external challenges—especially through improved digital outreach and staff management based on data insights—is essential for improving customer experience, boosting profitability, and building long-term sustainability in an increasingly data-driven restaurant industry.

5. Problem Solving Approach

5.1. Data Collection

The data used for this project comes from the restaurant's POS system, consisting of:

- **Master Data**: Includes invoice number, date/time, payment mode, order type, status, amount, discounts, tax components, etc.
- **Item-Wise Data**: Includes invoice ID, item name, quantity, category, price, table number, server name, etc.

5.2. Methods

To address the challenges of low online orders, inadequate weekly sales visibility, and poor category-level profitability, a data-driven analytical approach will be used. The project will rely on descriptive analytics to understand existing trends and behaviors, followed by visual analysis to detect operational inefficiencies. Key methods include:

- Time Series Analysis will be used to examine weekly sales trends and identify peak and lean hours. This will help the restaurant plan staffing and kitchen operations more efficiently.
- Insights from the analysis will be used to design targeted digital marketing strategies. Dishes identified as most frequently ordered will be promoted on online platforms using flyers and visual campaigns to boost online order engagement.
- Through item-wise data analysis, patterns in customer ordering behavior will be identified—such as frequently paired items or repeat combinations. These will be used to create attractive combo offers, which will be promoted on Swiggy, Zomato, and other digital platforms during specific time slots to increase average order value and visibility.

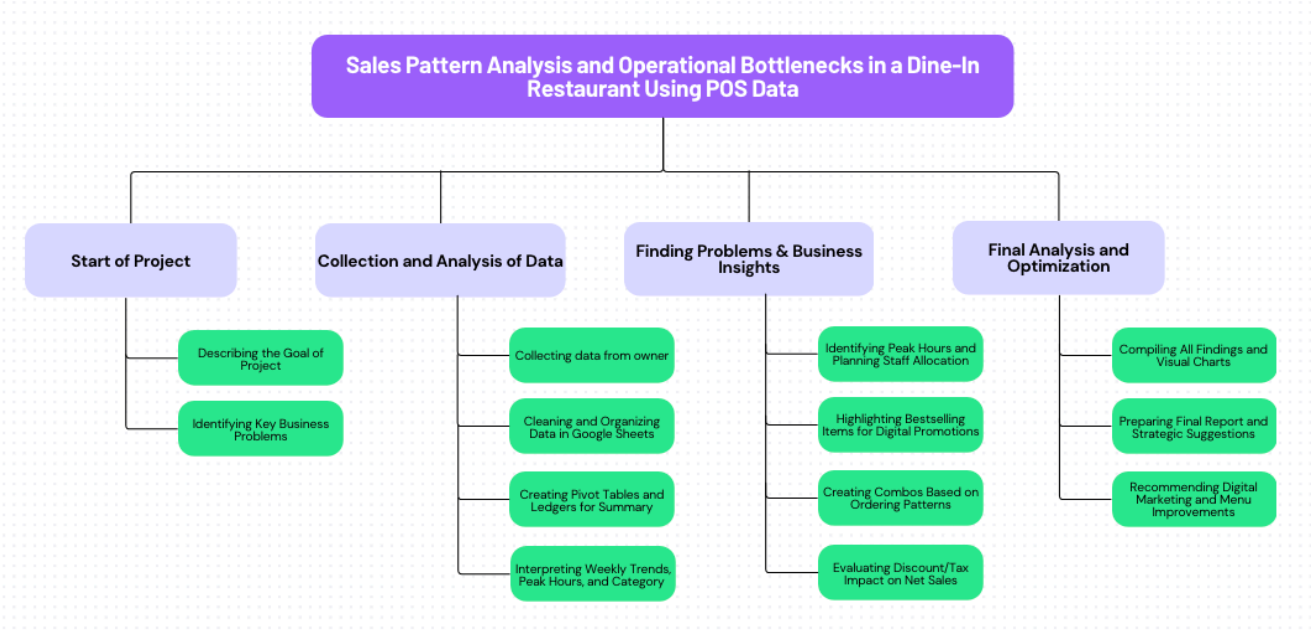
5.3. Analysis Tools

The primary tool for data analysis in this project will be **Google Sheets**, which offers a user-friendly and cloud-based platform for data organization, exploration, and visualization.
Google Sheets will be used for the following purposes:

- **Making Pivot Tables** – To efficiently arrange and examine item-by-item data. This will assist in compiling sales patterns, contributions by category, and order types throughout various time periods..
- **Generating Bar Charts and Pie Charts** – To visualize key metrics such as top-selling food items, peak sales hours, and category performance. These visualizations will support easier interpretation of data-driven insights and help in making strategic decisions.

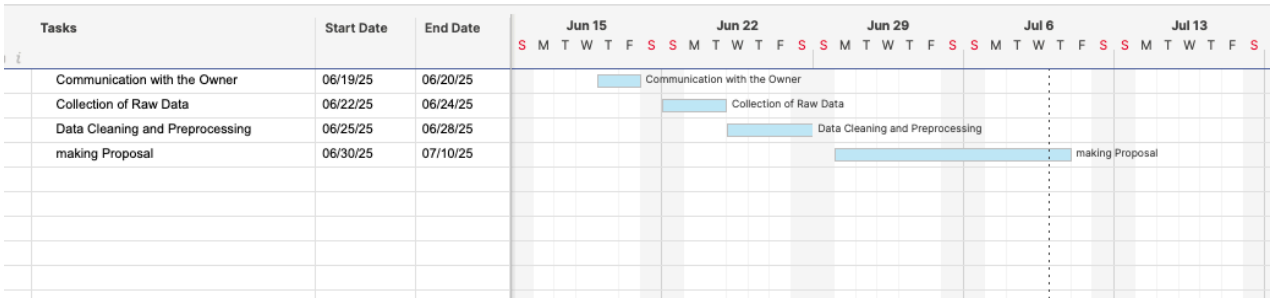
6. Expected Timeline

6.1. Work Breakdown Structure



Picture 2-Work Breakdown Structure

6.2. Gantt chart



Picture 3-Gantt chart

7. Expected Outcome

The following are the expected outcomes of this project:

- **Increase in Online Orders Through Targeted Digital Marketing:** By analyzing item-wise sales data, the restaurant will be able to identify its most popular dishes and highest-earning categories. These insights will help shape a focused digital marketing strategy that highlights bestsellers, creates combo meals based on common order patterns, and introduces limited-time offers during slower hours (like mid-afternoon).

- **Better Staff Scheduling at Peak Hours:** The restaurant will be able to clearly identify its busiest periods by using hourly and weekly sales trend data. Better staff scheduling will be possible as a result, preventing shortages at busy times. The staff can guarantee speedier service, faster table turnover, and an improved client experience overall with improved planning.
- **Overall Sales Optimization:** By effectively balancing offline and online orders, the restaurant will be able to expand its reach and strengthen its revenue streams. At the same time, improved staff management will aid in improving service speed and lowering operational problems, based on actual sales trends and peak-hour data. All things considered, these data-driven choices will improve daily operations, result in more efficient use of resources, raise profitability, and boost overall sales performance.