ENHANCING OPERATIONAL EFFICIENCY, SPACE AND INVENTORY MANAGEMENT AT 'JJ BEAUTY SALON'

A Proposal Report for the BDM Capstone Project

KALAVAGUNTA SAI SRI LEKHA
23f2003461
Jan 2025 TERM

INDIAN INSTITUTE OF TECHNOLOGY, MADRAS, CHENNAI
TAMIL NADU, INDIA, 600036

(BS) DEGREE IN DATA SCIENCE AND APPLICATIONS

Declaration Statement

I am working on a Project Title “Enhancing Operational Efficiency, Space and Inventory Management in a Beauty parlour ”. I extend my appreciation to **JJ Beauty Salon** 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: (Digital Signature)

Name: K Sai Sri Lekha

Date: 03-02-2025

Executive Summary

JJ Beauty Salon, located on Road No.8, S.V. Nagar, Nagaram, Hyderabad, was established on August 1, 2024, by **Mrs. Janet Elisha**. Operating under a **B2C (Business-to-Consumer)** model, the salon offers eyebrow threading, facials, de-tan treatments, nail care, skin and hair care, makeup, and saree draping, including home services for convenience. Despite its growing clientele, the salon faces operational inefficiencies affecting productivity and customer experience.

Key challenges include space constraints, as the single-room setup limits the number of customers served, causing congestion and long wait times. Manual inventory tracking leads to stockouts and wastage, while paper-based appointment scheduling causes errors and inefficiencies. Customers book through walk-ins and phone calls, making scheduling unstructured.

This project aims to improve space usage, inventory management, and record-keeping using data-driven solutions. Customer flow analysis will optimize the layout, ABC analysis will enhance stock control, and an appointment system will minimize waiting times. Transitioning to digital records using Google Sheets or Excel will streamline operations. These solutions will boost efficiency, reduce waste, and enhance customer satisfaction, ensuring sustainable business growth.

The expected outcome includes increased operational efficiency, enhanced customer satisfaction.

Organisation Background

JJ Beauty Salon, located at Road No.8, S.V. Nagar, Nagaram, Hyderabad, Telangana (Pin Code: 500062), was established on **August 1, 2024,** by **Mrs. Janet Elisha.** As the first entrepreneur in her family, she turned her passion for beauty and personal care into a business that offers skin care, hair

care, makeup, nail art, and saree draping services. The salon also provides home services for clients who prefer doorstep beauty care, such as brides and busy mothers**.**

The salon operates from 4:00 PM to 8:00 PM daily, with Janet Elisha and one additional staff member handling both in-salon and home service appointments. On average, the salon serves 5 clients per day, with a mix of walk-ins and phone call bookings**.** The most in-demand services include eyebrow threading, facials, and de-tan treatments**.**

JJ Beauty Salon follows a B2C (Business-to-Consumer) model and has seen steady growth in its clientele within a short period. While exact revenue figures are not disclosed, the salon earns 80% from services and 20% from product sales**.**

Google Maps link

Instagram Handle

Problem Statement

Despite its growing customer base, JJ Beauty Salon faces operational inefficiencies that hinder productivity, customer experience, and decision-making. The absence of a data-driven approach to managing critical business areas results in suboptimal resource allocation, revenue loss, and diminished customer satisfaction.

1. **Customer Wait Times & Appointment Bottlenecks** – The salon lacks an efficient appointment scheduling system, resulting in unstructured walk-ins, overlapping bookings, and longer wait times. This leads to reduced customer retention and negatively impacts service quality.
2. **Inventory Mismanagement** – Inventory levels are tracked manually, causing overstocking, stockouts, and unpredictable reorder patterns. Without proper demand forecasting, the salon faces waste and missed sales opportunities.

3. **Revenue Tracking & Business Insights** – Manual financial record-keeping makes it challenging to analyze sales trends, identify high-revenue services, and determine peak business hours. This limits the ability to extract meaningful insights for decision-making.

Background of the Problems

Expanding the problems

1. **Customer Wait Times & Appointment Bottlenecks**
   As the salon's clientele grows, so does the complexity of managing appointments. The absence of a structured, data-driven appointment system leads to walk-ins being treated without any predefined scheduling process. This results in overlapping bookings and unanticipated rush hours, causing long wait times for customers. As customers are left waiting, their experience suffers, leading to potential dissatisfaction and a loss of repeat business. Additionally, employees struggle to manage peak hours effectively, impacting overall service quality and the ability to take on more clients.
2. **Inventory Mismanagement**
   The salon relies on manual methods for tracking inventory, including products for beauty treatments, salon tools, and other supplies. This lack of automation leads to inefficiencies in managing stock levels. Overstocking creates storage issues, tying up capital in unsold goods, while stockouts lead to disruptions in service when essential products are unavailable. Furthermore, without access to demand data or predictive analytics, the salon is unable to forecast inventory needs accurately, contributing to waste and missed sales opportunities. The absence of a system to analyze consumption trends prevents the business from making informed decisions about procurement and stock rotation.
3. **Revenue Tracking & Business Insights**
   The salon maintains financial records manually, making it difficult to derive insights from sales data. This method of record-keeping limits the ability to identify trends such as the most profitable services, peak sales periods, or the effectiveness of promotional campaigns. Without a comprehensive view of revenue performance, pricing strategies and resource allocation are often based on assumptions rather than data. This leaves the salon vulnerable to

missed opportunities for optimization, including adjusting service prices or offering targeted promotions that could increase profitability.

As the salon seeks to grow and compete in a fast-paced industry, these operational inefficiencies must be addressed in order to improve service delivery, resource management, and strategic decision-making.

Problem-Solving Approach

To address the operational challenges faced by JJ Beauty Salon, a data-driven approach will be implemented. This strategy focuses on utilizing data analytics to optimize space, improve inventory management, enhance scheduling efficiency, and transition to digital record-keeping.

a. Methods Used

1. **Space Optimization:** Space management will be enhanced by analyzing usage patterns. Data on foot traffic, service duration, and customer wait times is collected. This data will inform decisions on where to place furniture or adjust equipment to improve the flow of customers and reduce congestion. Space utilization will be assessed using heatmaps or customer traffic data collected during peak hours.
2. **Inventory Management:** To prevent understocking and overstocking, inventory data is tracked using ABC analysis and demand forecasting. Data on product usage is collected over a specified period (e.g., monthly), and historical usage patterns are analyzed to predict future demand. Predictive analytics will be used to optimize stock levels and reorder patterns, reducing waste and ensuring availability of essential products.
3. **Appointment Scheduling:** An advanced, data-driven appointment scheduling system will be implemented to reduce bottlenecks and optimize time slots. Data on customer booking behavior, peak times, and service durations is collected to develop a predictive scheduling model. This model will allow for smarter allocation of appointment slots, preventing overlaps and reducing wait times.

4. **Digital Record-Keeping:** The transition to digital record-keeping will streamline appointment management, inventory tracking, and financial records. Google Sheets or Excel will be used for collecting and organizing data, with automated tracking of appointments, inventory levels, and sales. This will minimize errors, improve accuracy, and save time. Additionally, Python (using libraries such as Pandas and Matplotlib) will be employed for advanced data analysis and reporting, helping identify patterns and forecast future trends.

b. Intended Data Collection

The following data is collected to drive decision-making and improve salon operations:

- **Services Data:** Types of services provided (e.g., haircuts, makeup), service durations, and customer preferences.
- **Inventory Data:** Quantity of products used (e.g., skin care, hair care), current stock levels, reorder points, and restock needs.
- **Appointment Data:** Customer bookings, service times, and appointment lead times.
- **Sales Data:** Daily earnings from services and products, including trends in peak hours and seasonal demand.

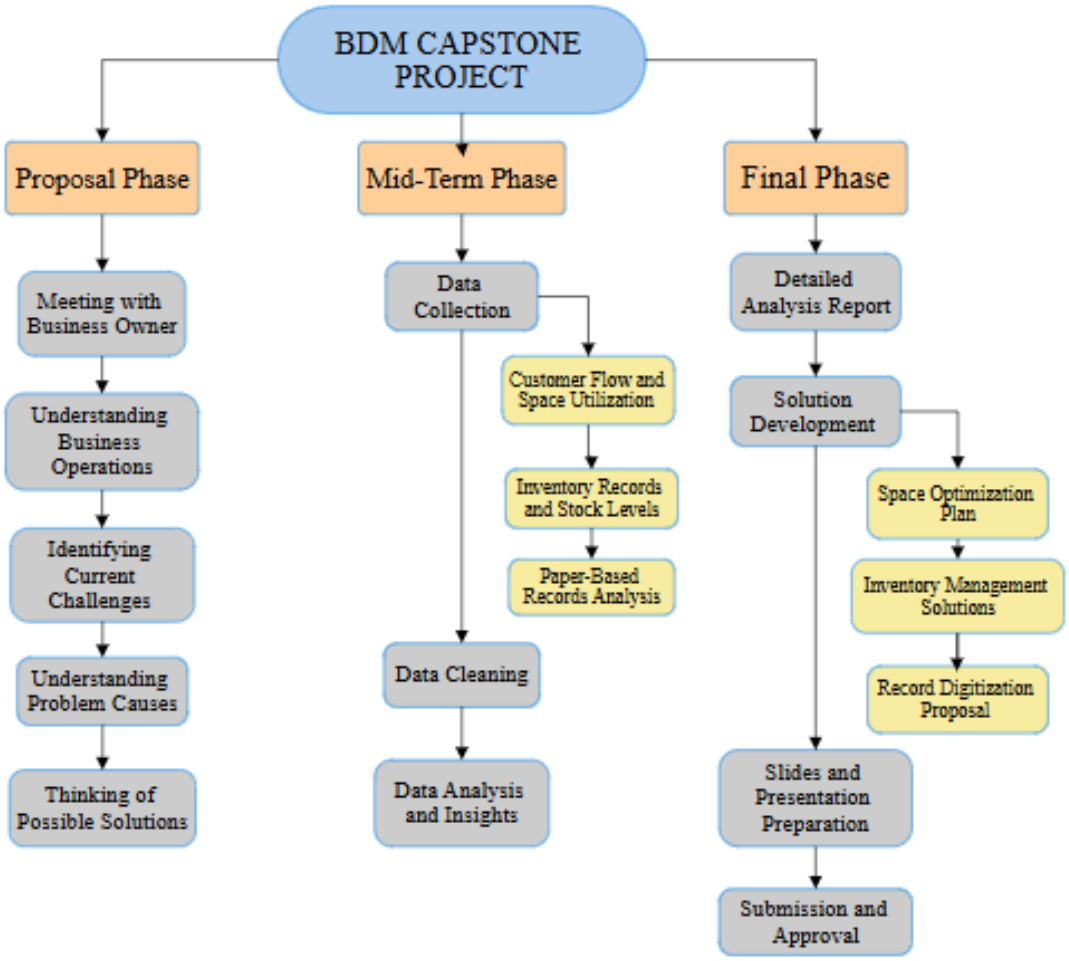
c. Tools and Techniques

1. **Microsoft Excel or Google Sheets:** These tools will be used to track inventory, appointments, and finances. Pivot tables, charts, and conditional formatting will be employed to identify trends and patterns in the data.
2. **Python (for Advanced Analysis):** Python will be used for data manipulation, trend analysis, and forecasting. Libraries like Pandas and Matplotlib will analyze inventory patterns, customer booking behavior, and sales data, enabling more accurate demand predictions and improved resource allocation.

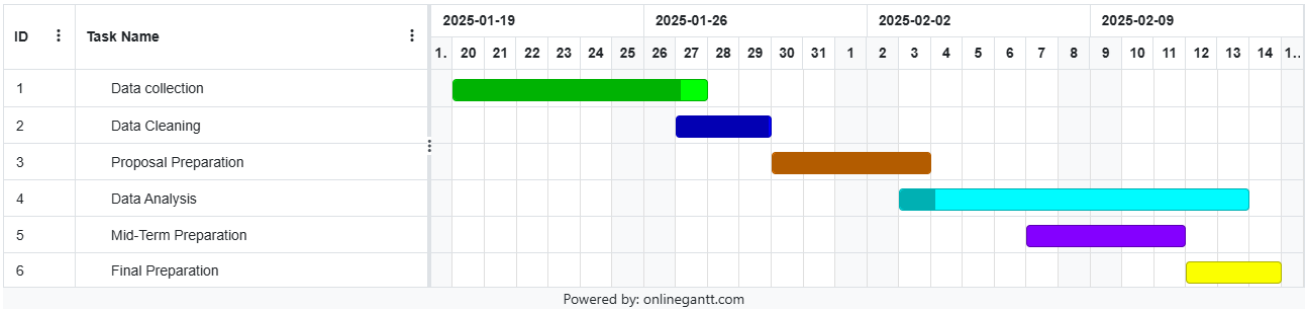
d. Data Collection Period

Data is being collected over a period of 4 months to ensure accurate trend analysis and forecasting. This will allow sufficient time for meaningful patterns to emerge and provide the salon with insights into long-term trends, helping improve decision-making and operational efficiency.

Work Breakdown Structure



Expected Timeline



The project is anticipated to be completed within the projected timeframe reflecting a structured and phased approach, ensuring smooth progression till final preparation.

Expected Outcomes

By implementing this data-driven approach, JJ Beauty Salon will:

- **Optimize space usage** by improving staff and customer flow, leading to better space utilization.
- **Enhance inventory management** by reducing waste and preventing stockouts through predictive analytics.
- **Automate appointment scheduling**, reducing wait times and improving customer satisfaction.
- **Transition to digital record-keeping**, improving accuracy, efficiency, and decision-making.

These improvements will boost operational efficiency and customer experience, supporting the salon's long-term growth and success.