

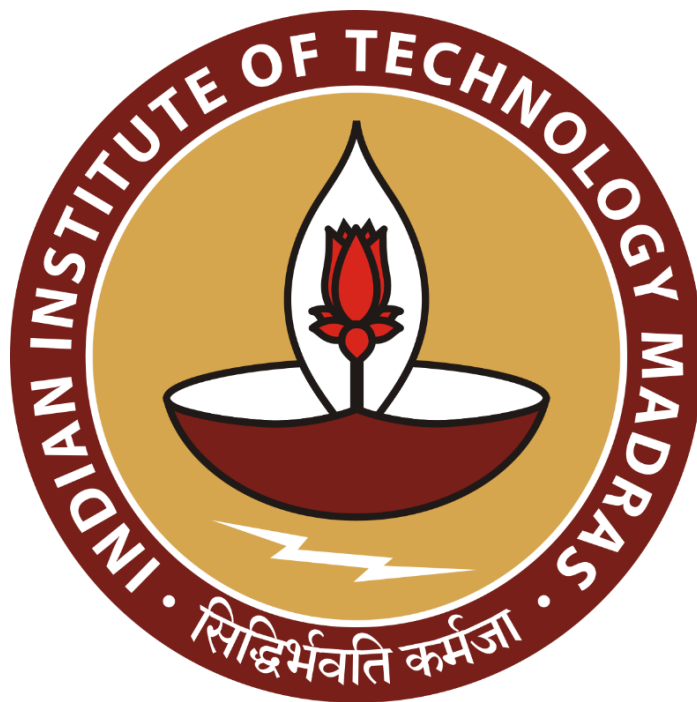
Analytical Study of Operational Efficiency and Financial Optimization in a Dental Clinic

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled “Analytical Study of Operational Efficiency and Financial Optimization in a Dental Clinic”. I extend my appreciation to Aadya Family Dental Center, 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.

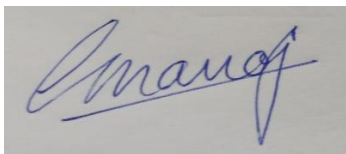
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

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: Manoj Prathapa

Date: 02-02-2025

1 Executive Summary

The project aims to get a good grasp and provide suitable solutions for many problems at Aadya Family Dental Center-a dental clinic located at Aecce Layout, Bangalore, Karnataka. This dental clinic has been functioning for the last eleven years and provides consultations, restorative treatments, and preventive care based on ethical dentistry and an affordable price line.

There are three major hurdles: an ineffective appointment scheduling system, revenue loss as a result of outstanding payments, and lack of data-driven pricing strategies. The time taken in waiting during the course of consulting the patient creates long waiting queues, contributing to increased idle hours, unsteady revenues, and inefficient utilization of services-this translates to low patient satisfaction and poor patient retention.

The project will use two kinds of data for analysis-the inflow of patients, scheduling inefficiencies, and consultation time duration to provide better time slots for appointments and workflow management-and the financial records, including revenue streams, outstanding payments, and discounts, to enable organized payment plans and pricing strategies.

An analysis of these sets of information should elucidate paths to better operational efficiency, financial management, and sustainability. The main aim is to establish a data-driven solution with the goal of optimizing operations to minimize financial risk, manage administrative workload on staff, and enhance the patient experience in Aadya Family Dental Center.

2 Organization Background

Business Name: Aadya Family Dental Center

Address:3rd Main Rd, AECS Layout, Marathahalli, Bengaluru, Karnataka

Owner's Name: Dr. Ragini Kiran Meka

The business i am working with is Aadya Family Dental Center, owned and run by Dr Ragini Kiran Meka it has provided ethical quality and affordability in dental care over eleven years. Founded with the goal of making professional dental services available to everyone, it soon became a household name. With a B2C business model, this center has services ranging from preventive check-ups to painstaking advanced restorations. Very much its fame of having a lasting commendation of translucent dealings, hygienic sanitation, and patient-first approach aimed to achieve long-term oral health.

Trust and high-quality service are prime at Aadya Family Dental Center that constantly advances with the help of trained staff and techniques for confronting varied hurdles. It is

nurtured with utmost care and precision. With the recognition for morality and a long-range solution for oral health, the clinic wishes to provide the best and most reliable dental care.

3 Problem Statement (Listed as objectives)

3.1 Problem Statement 1:

Appointment and consultation management are ineffective due to unpredictable consultation times which lead to inefficiency in scheduling, with long patient waits and limited service capacity.

3.2 Problem Statement 2:

Payment and revenue management depend too much on uncollected payments and discounting practices which threaten financial stability, making revenue forecasting and cash management very complicated

3.3 Problem Statement 3:

Working out high-revenue procedures and effective marketing and pricing strategies of the owner will bring a new degree of freedom and creativity from the owner to maximize both revenues and profits.

4 Background of the Problem

While Aadya Family Dental Center offers patients the most essential dental care, like many other clinics, it faces hurdles on the operational front. One of those challenges is the waiting time for consultations, which is unpredictable. Such unpredictability causes forced waiting, which further complicates the procedure of appointment setting. Ultimately it affects the number of patients that the clinic can see each day.

Another issue is a working capital problem. Uncollected revenue due to too many discounts and the ineffectiveness of the follow-up system causes uncertainty in cash flow. A lack of an effective plan for collection makes it hard to maintain profiting income.

The clinic does not have a well-organized method for value-based operational procedures. While some treatments are extremely profitable, others fail to take sufficient advantage of profitability simply because it is not a very common treatment. Such confusion makes pricing strategies hazy, which can affect their margins profoundly.

Overall, inefficiencies in scheduling processes, revenue collections, and pricing strategies substantially diminish the realization of potential for the clinic. The structured processes and data-driven practices will thus improve the profitability and robust operational performance and a significant resource to provide even better care to its patients.

5 Problem Solving Approach

5a. Detailed Overview of Methods Used and Their Justification

In order to determine and suggest solutions to 'Aadya Family Dental Center' issues, both quantitative and qualitative data collection techniques will be adopted.

Quantitative Methods:

Time-Series Analysis: The clinic will analyse historical data in order to spot trends in appointment scheduling, patient inflow, and financial performance. Data on the factors that govern scheduling and patient inflow will guide the clinic in the optimization of their service to pinpoint how they should manage their finances.

Statistical Computation: The basic statistical techniques that will be applied to elicit purposeful insights from financial data are many. These techniques will assess payments and discounts and services. Discount policies and outstanding accounts will inform our financial policy revisions. Service trends will inform pricing and resource allocation.

Qualitative Methods:

Conversations and Observation: An in-depth conversation with the owner and the staff and observation of daily operations plan to be taking place to gain qualitative insights into facing and inefficiencies so that improvements can be implemented.

5b. Overview of Intended Data Collection and Its Justification:

Appointment Data: Analysis of consultation durations plus appointment patterns would allow for better scheduling, which will reduce patient waiting time.

Financial Records: Payment trends concerning debts and incongruities analyze strategies for more effective revenue collection.

Data on Service Utilization: Repetitive and high-margin procedures will provide parameters by which to set charges and market the respective procedures and treatments.

Explanation:

Understanding how the "patient flow," consultation length, and patient processing duration would assist in optimizing scheduling and service delivery. The trendline for payment and dues is of utmost importance in planning finances and completing payment cycles. Service utilization data will help set pricing, ensuring that the clinic extracts maximum revenue from the most profitable services.

5c. Analysis Tools and Their Justification:

Analysis Tools:

Google Sheets and Excel: These two programs are mainly meant for processing, cleaning, log data, and simple identification of trends. Diagrams and other computations with their relative merits and deep insights will be discovered.

Python (A powerful programming language with Pandas, Matplotlib, Seaborn Libraries): Interpreting the data is a bit advanced and this can hereby enable Excel as well as a tool that performs complex and advanced computations on the data.

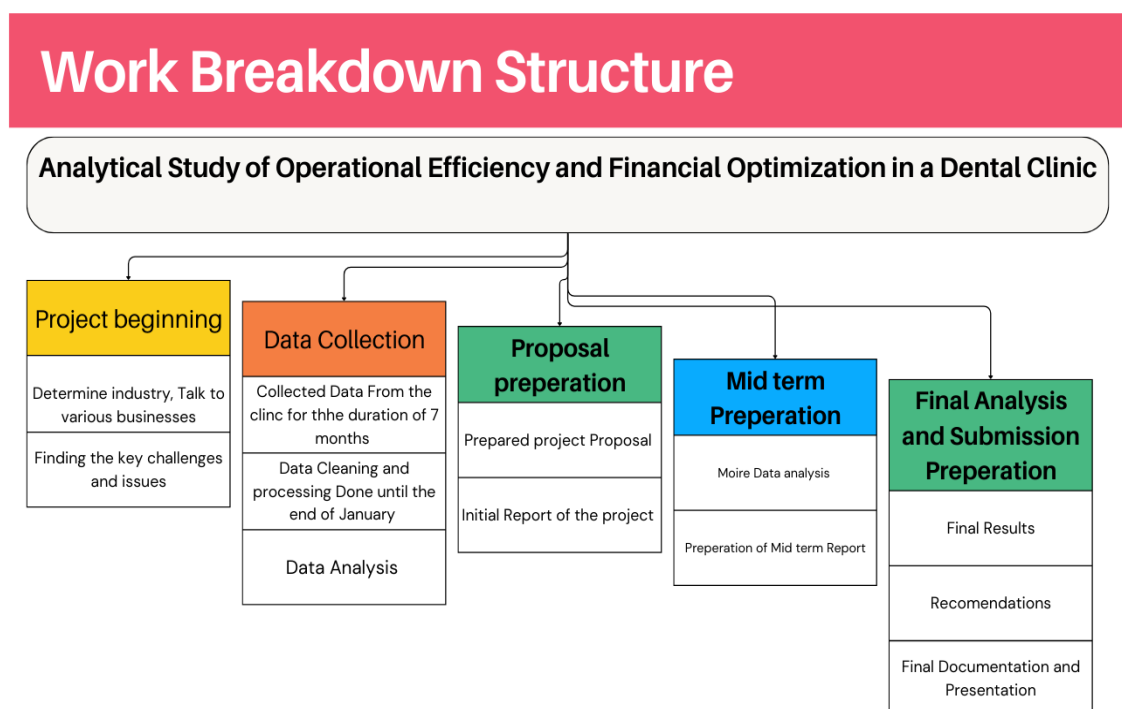
Justification:

Google Sheets and Excel: These applications are supposed to aid the user in basic data manipulation and analysis and are good for computation, charts, and some interactive visualizations.

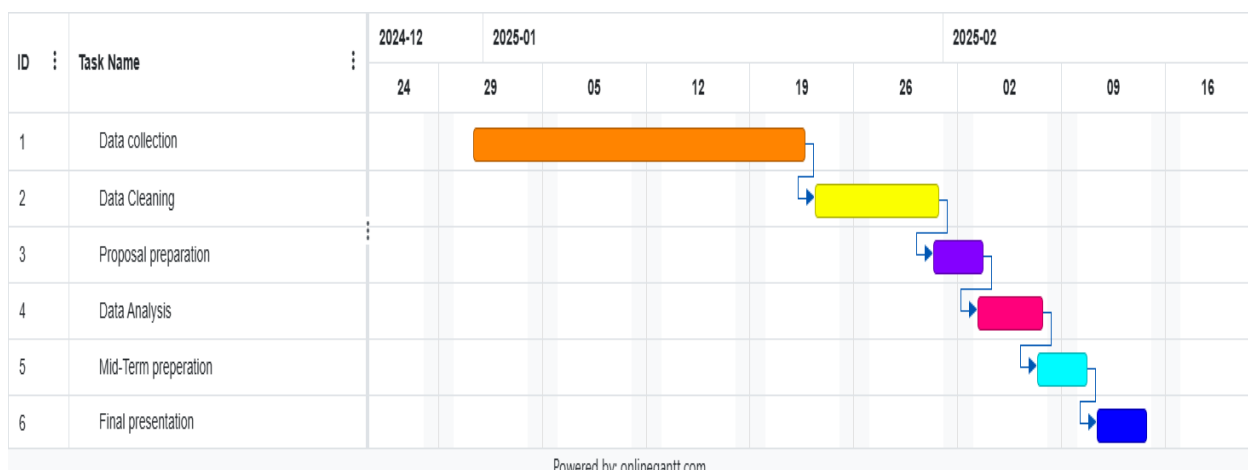
Python (with Matplotlib and Seaborn): Python offers complex data manipulation and visualization due to many libraries, such as Matplotlib and Seaborn, combining enhanced computational prowess. It complements the Excel techniques to access a more profound and informative analysis of the dataset, dynamic plots, and detailed statistical analysis.

6 Expected Timeline

6.1 Work Breakdown Structure:



6.2 Gantt chart



7 Expected Outcome

- **Optimized Appointment Scheduling:** To have a data driven approach by analyzing the past records and data and have a clear and efficient patient flow management thereby increasing the customer satisfaction by reducing wait times and reducing the workload on doctors and management of schedules for consulting the maximum number of patients in a day and therefore increasing the revenue and profits of the clinic.
- **Develop strategies to ensure desirable and sustainable margins,**ultimately contributing to the profitability and financial stability of the business. Also these data-driven analyses would provide a comprehensive financial survey of the business.
Improved revenue will be collected by structured follow-ups for tracking of dues-offering timely reminders to customers for obtaining payment. This helps in preventing revenue leakages and implementation of automated invoice or billing systems would ensure standard discounting and accurate billing.
- **Refined Pricing Strategy:** through the analysis of data we can find the clinics most profitable procedures and price them according to demand and patient demographics we can also effectively market these procedures and operations to increase the revenue and profits from these procedures.