

DATA DRIVEN ANALYSIS FOR OPERATIONAL IMPROVEMENT: TELANGANA BELLAM CHAI

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled “**DATA DRIVEN ANALYSIS FOR OPERATIONAL IMPROVEMENT: TELANGANA BELLAM CHAI**”. I extend my appreciation to **Telangana Bellam Chai**, 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.

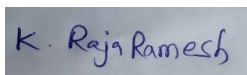
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

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:

A rectangular box containing a handwritten signature in blue ink that reads "K. Raja Ramesh".

Name: Kamera Rajaramesh

Date: 13-10-2025

1 Executive Summary

The project is focuses on a Tea shop named Telangana Bellam Chai, located in Kadem, Nirmal, Telangana. The business established and operated by the by Mr. Godari Swamy, it is established in 2024, This is a B2C (Business to Customer) and primarily deals in Telangana traditional jaggery tea (bellam chai) along with regular tea, coffees, some type of milk shakes and light snacks to local customers in a casual, roadside setup.

The key challenges at 'Telangana Bellam Chai' includes poor inventory management, increased customer credit leading to cash-flow problems, the absence of additional workers causes delays and revenue loss during peak hours, resulting in low profits and unsustainable business operations.

This project focuses on studying the shop's daily sales and operations to find where things can be improved by analyzing data on inventory and sales, the aim is to understand what's affecting profits and cash flow. Using simple analytical and visualization tools, the project will forecast demand, manage stock more effectively, and suggest practical steps to reduce losses. Secondly, I will gather data concerning selected major creditors of the business. Through a thorough analysis, my goal is to develop a method for setting credit criteria. This approach seeks to maximize gains and minimize losses, providing the owner with a more structured way to decide who gets credit. The expected outcome is smoother operations, better inventory control and improved earnings for Telangana Bellam Chai.

2 Organisation Background

Business Name: Telangana Bellam Chai

Address: Kadem, Nirmal, Telangana 504202

Owner's Name: Mr. Godari Swamy

Telangana Bellam Chai is a small scale Food and Beverage business, it is owned and operated by Mr. Swamy, established in 2024, it sells traditional Jaggery Tea (Bellam Chai) along with Regular Tea (dhum chai), Milk shakes, different types of Coffees and Snacks like Osmania Biscuit, Good Day Biscuits, 20-20 Biscuits etc. The shop focuses on providing freshly brewed tea made with natural jaggery powder, offering a healthier and more authentic alternative to regular tea. The main customers are Local commuters, students, and workers in the around Kadem. The mission of the business is to promote the taste and health benefits of Jaggery Tea, compared to other tea shops this shop gives good quality tea for affordable prices. Location: <https://maps.app.goo.gl/E6KHEJVhMCCdP9hR7>

3 Problem Statement

- 3.1 **Inefficient Inventory Management:** The shop facing lack of proper inventory management, where some items like Milk, Jiggery powder run short but other products are overstocked. This leads to the stockouts and overstock of the different type of ingredients.
- 3.2 **High Customer Credit and Poor Cash Flow:** Large portion of daily sales remains unpaid due to excessive customer credit, resulting poor cash circulation. The project focuses on managing and limiting customer credit.
- 3.3 **Lack of Workforce and Revenue leakage:** Since the owner only manages all operations alone, payments are often missing during peak hours, this is causing revenue loss. The project intends to identify time-based sales trends to suggest operational improvements or low-cost staffing solutions.

4 Background of the Problem

The issues faced by Telangana Bellam Chai is a small-scale tea selling shop. It is operated by only one single owner, who manages all activities including preparing tea to all management issues. One of the major issues of the shop is poor inventory management, the main items for preparing tea like milk, jiggery powder run out very fast, while others are overstocked. This happens because there is no proper record keeping of the items or forecast demand, this leads to forcing the owner to leave the shop during the business hours to restock, this leads to the lost sales.

Secondly the increasing of customer credit, this is affecting the daily cash flow and making difficult to manage expenses further. Without a structured system for maintaining and monitoring credit transactions, the owner struggles to recover dues on time. And another issue, since there are no additional workers, the owner needs to handle everything in the shop, this resulting in missed payments and slower service during peak hours.

In summary, the main issues come from poor stock control, too much credit given to customers, and lack of manpower. Using the basic analysis and simple management practices can make daily operations smoother and help increase profits for Telangana Bellam Chai.

5 Problem Solving Approach

5a. Details about the methods used with Justification:

Given the nature of problems faced by the Telangana Bellam Chai is a combination of Quantitative and Qualitative analytical methods will be used to identify, understand and

address the key operational challenges.

Qualitative Methods:

Descriptive Analysis: This method is used for the summarize the daily sales, inventory and customer credit records. It will help to identify the type of items which are run out frequently and how credit transactions affect overall cash flow.

Diagnostic Analysis: This method will focus on finding root causes of inefficiency in the inventory flow or why certain time slots show missed payments.

Predictive Analysis: Based on the previous data, forecasting models will be developed to estimate demand for key ingredients, enabling the owner to plan purchases efficiency and prevent stockouts.

Qualitative Methods:

Owner Interaction: Regular discussion with the shop owner, Mr. Godari Swamy provided deeper and clear of his daily operations and difficulties in managing credit customers.

Observation: On observing the shop for 2 weeks during busy hours is helped me to understand the service flow, the transaction gaps, and customer behavior during rush hours.

5b. Details about the intended data collection with Justification:

Sales and Inventory Data: The data is collected on the daily tea sales, quantity of milk, jiggery powder and other items purchased and used, and other supply details. This information will support trend analysis and help determine the ideal restock levels for raw materials.

Customer Credit Data: Details like customer name, amount owed and repayment timelines will be collected to study repayment and credit impact on cash flow.

Justification:

Collecting sales and inventory data gives a clear understanding of product and demand consumption, ensuring data accuracy for forecasting. Credit data helps in develop structured repayments this reduces financial strain caused by unpaid dues.

5c. Analysis Tools and Justification:

Analysis Tools:

Google Sheets and Excel: For preliminary data processing, cleaning, and analysis. Drawing charts and conducting various computations to uncover meaningful insights.

Python with Pandas and Matplotlib/Seaborn library: Will be used alongside Excel to explore the data more comprehensively, create visual representations, and extract additional insights.

Justification:

Google Sheets and Excel: Efficient for data processing and analysis, providing a user-friendly interface for fundamental computations and chart creation.

Python: Enables advanced data manipulation and sophisticated visualizations, complementing Excel's capabilities for a more comprehensive understanding of the dataset.

6 Expected Timeline

6.1 Gantt Chart:

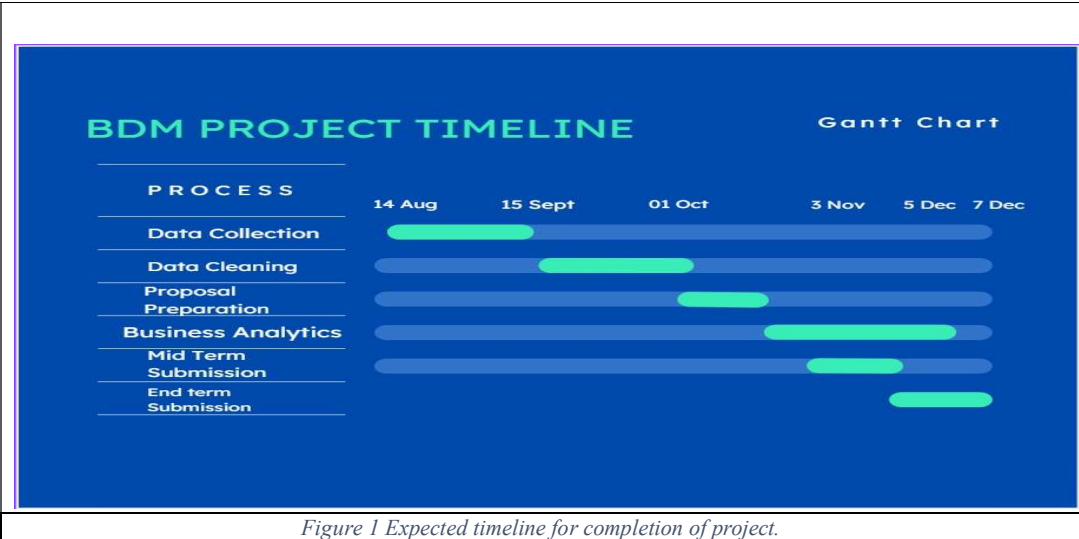


Figure 1 Expected timeline for completion of project.

6.2 Work Breakdown Structure

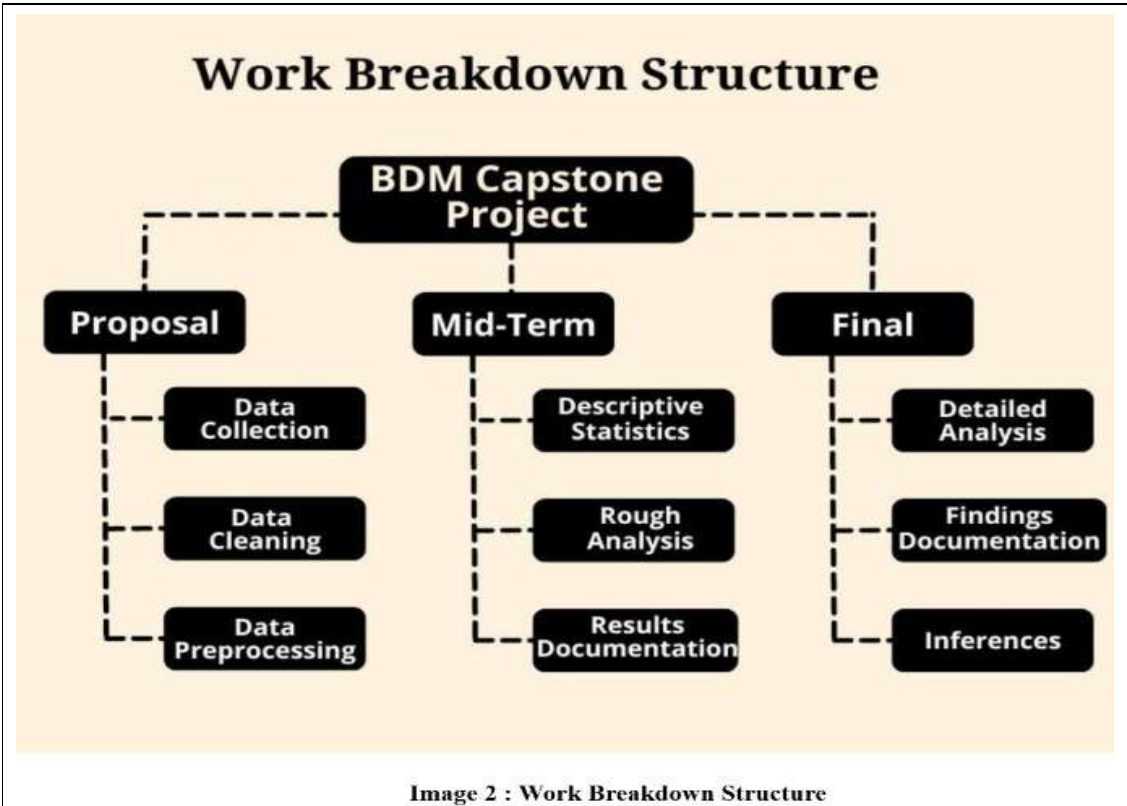


Image 2 : Work Breakdown Structure

7 Expected Outcome

Improved Inventory Management:

By studying daily sales and usage data, the project aims to help maintain the right quantity of raw materials like milk and jaggery powder, preventing both shortages and excess stock.

Accurate demand Prediction:

The project will identify the busy hours and high demand days by using time-based data analysis, allowing to better resource planning and purchase scheduling.

Structured and credit Management:

A clear and reliable credit policy can be developed to track dues, identify consistent payers, and reduce financial pressure from delayed payments through the data insights.

Better Operational Monitoring:

To track day by day performance and making faster business decisions will be supported by the simple dashboards and analytical tools.

Increased Profit Margins:

Improved inventory control, good credit handling and organized planning will give higher profitability and smoother financial operations.