DATA ANALYSIS

AND

OPTIMIZATION OF THE SUPPLY CHAIN OF

BAKERY BUSINESS

Submitted by

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Declaration Statement

 I extend my appreciation to <u>ROCHER'S THE BAKE SHOP</u>, 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:

Supravat Barc

Date: 27 January 2024

EXECUTIVE SUMMARY

The bakery business in Lucknow began after the lockdown period with cart vehicles for mobile sales across different locations. A significant investment of 6-7 lakh rupees from three friends kickstarted the venture. As demand grew, they established a cloud kitchen for centralized production from raw materials, ensuring quality and consistency.

The operational setup includes 5 hawkers managing sales and 3 staff members in the cloud kitchen handling production. This integrated approach combines traditional selling methods with modern production techniques, optimizing resources and enhancing customer satisfaction. The products they are selling are

- Fudgy Brownies,
- Chocolate Filling Doughnut,
- Choco Chunk,
- Double Chocolate,
- Fudgy Brownies,
- Triple Chocolate Brownie,
- Blueberry Cake,
- Butterscotch Cake etc.

I have chosen this because the business is own by my friend so that I can manage to get the data and through discussion I came to know some serious problems they are facing while running their business.

Data collection:

I know the founders personally because he is a very good friend of mine and I have done some freelancing project for them in their initial days of starting. So I have asked him about how is the business going on and what are the problems he is facing to run the business. Then I asked him if I could help him as I am doing my BDM project. Then he agreed and give me the data of two months of selling. But the data was raw excel format and I had to clean it to perform analysis.

Organization Background:

Rocher's The Bakeshop is a dessert shop in Lucknow, Uttar Pradesh, India. They offer a variety of desserts, including: Cookies, Brownies, Donuts, Jar cakes, Cheesecake.Their unique approach involves mobile carts and dedicated hawkers, ensuring that the mouthwatering, freshly baked desserts reach people in diverse locations.With a commitment to quality and convenience, aim to cherish the lives of countless individuals with their scrumptious treats.

Details of the organization:

Founders: Rohit Maurya, Swastik Saxena,

Number of employees: 8 (5 hawkers and 3 people in their cloud kitchen)

Address: Rocher's The Bakeshop Cloud Kitchen is located at 2/21, Kursi Road, Sector C, Jankipuram, pin-226021, Lucknow, phone number is 9340709803.

Vision of the Enterprise:

In June 2022 they started with their first cart placing near school. In April 2023, 5 new carts were added to different schools and street food market. Lucknow itself has potential of 15 more carts other than that they can go for all metro cities in India.

Shop picture

Problem Statement (Listed as objectives):

- In metro cities there are so many bakery business have been developed over the years so the competition is very high for them. To make a brand identity they have to come up with some creative business model.
- While the bakery has a strong customer base among school and college students, expanding to a wider demographic requires targeted marketing strategies and a diverse range of product offerings to appeal to different age groups and preferences.
- Ensuring product freshness for 4-5 days is a critical operational challenge for the bakery. It requires implementing efficient refrigeration systems and adopting meticulous inventory management practices to maintain consistent quality standards.

Hence problem statement can be comprised of the following:

- The store's net profit is below expectations due to challenges in customer retention and acquisition.
- Excessive inventory levels are leading to issues such as food wastage and product damage, posing financial risks to the business.
- Inadequate customer engagement strategies are hindering the store's ability to maintain loyalty and attract new patrons, impacting overall profitability.

Background of the problem:

The bakery business in Lucknow was established in the last quarter of the financial year 2021 with an initial investment of 6-7 lakh rupees. Operating 5 carts across diverse locations, they have achieved a steady monthly sales figure of around 8 lakh rupees. However, challenges persist in terms of market competitiveness and food preservation strategies.

The introduction of a proprietary cloud kitchen service has notably increased profit margins per product, showcasing a strategic shift towards efficient production and cost management. Despite this, the business faces stiff competition from numerous other bakery shops in the area, necessitating targeted marketing and differentiation strategies to expand their customer base beyond their current demographic of school and college students.

One key operational challenge revolves around food preservation. Given the inherent short shelf life of bakery products, the business relies on refrigeration to maintain product freshness for 4-5 days. This requires meticulous inventory

management and storage practices to ensure quality standards are met consistently.

Problem Solving Approach:

The sales data I have collected provides a comprehensive overview of the business's sales model. Thus, I will have enough of room to analyze my data so that I can able to see the data insights. I can also create pie charts and stacked histograms using pivot tables in Excell.

Despite the seller offering a diverse array of products, I have opted to focus on ten specific items to ensure a definitive and streamlined data collection and analysis process. For these selected products, I have meticulously compiled the following variables:

- making cost
- sale price
- quantity sold

Problem solving technique I have used:

Employing a range of problem-solving techniques, I am poised to calculate pivotal figures such as revenue, expenses, gross profit, net profit, and profit margin. Additionally, I aim to derive insights into average inventory levels, damage-related waste, and a plethora of critical financial ratios, including ROCE (return on capital employed), gross profit ratio, and net profit ratio.

To facilitate the computation of these essential metrics, I am not only considering the direct costs associated with production but also endeavoring to gather data on capital investments, liabilities, assets, and maintenance expenses. This comprehensive approach ensures a thorough analysis, providing a holistic perspective on the financial health of our business.

The following tools are employed throughout the analysis:

- ❖ Utilize Pivot Tables in Excel for efficient computation and analysis of data along rows and columns, facilitating effective filtering and aggregation of time series data.

- ❖ Employ a range of Excel functions, VLOOKUP, and COUNTIF, to manipulate and extract insights from the time series data, enhancing the depth and accuracy of analysis.
- ❖ Leverage various data visualization tools such as pie charts, heat maps, stacked histograms, and histograms to present trends, patterns, and relationships within the time series data, enabling clear communication of findings and facilitating informed decision-making processes.

Expected Timeline:

I have collected 2 months (November 2023 and December 2023) worth of data, which was first cleaned, and then I have perform required excel function and procedures to make charts and graphs so that I can make some business decision out of it.
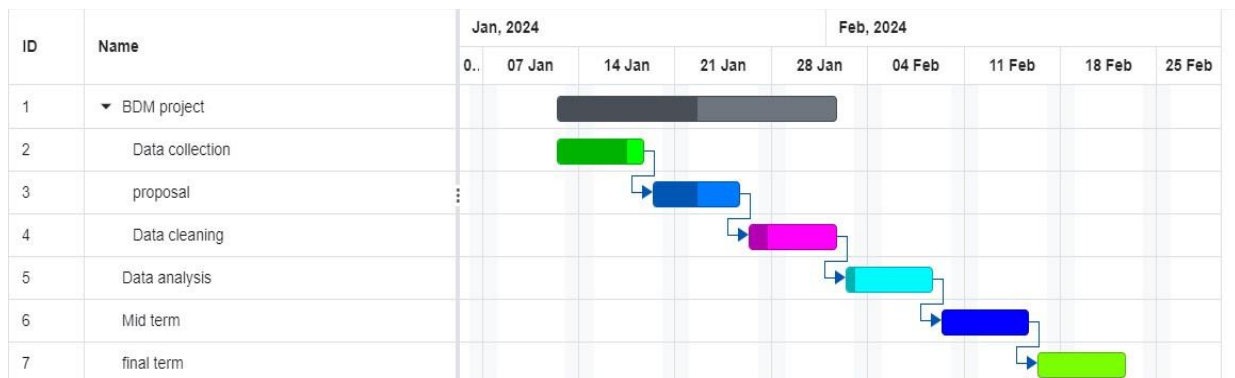
Gantt chart

Expected Outcome:

- ❖ Developing a comprehensive business plan to manage dynamic pricing models, and targeted marketing initiatives to enhance profitability and sustain long-term growth.

- ❖ Adopting an integrated Inventory Management System to minimize stockouts, reduce holding costs, and streamline procurement processes.

- ❖ Analyze the expenses, and inventory data, providing actionable insights for informed decision-making and resource optimization.