OPTIMIZING INVENTORY MANAGEMENT FOR BOOSTING BUSINESS EFFICIENCY AND CUTTING OPERATIONAL COSTS

A PROPOSAL REPORT FOR THE BDM CAPSTONE PROJECT

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Executive Summary

"Brew N Bistro" is a small Cafe located Ground Madhu Dwarapu, Garden Building, 102, Dr NTR Beach Rd, near KKR Goutham School, Lawsons Bay Colony, Pedda Waltair, Visakhapatnam, Andhra Pradesh 530017.It is a B2C that deals directly with customers in the segment of 'Food Service'.

The major issue that the Brew N Bistro is facing in tracking inventory and keeping stocks of the amount of product inflow and outflow. The fast-paced nature of the restaurant and the wide variety of materials utilized make inventory management a complex task. This problem has led to potential wastage, stock discrepancies, and operational inefficiencies.

The main objectives include implementing a data-driven approach to inventory management, accurately tracking and quantifying inventory, and identifying cost-saving opportunities. By utilizing tools such as Excel, Python, and Machine Learning, the Brew N Bistro seeks to streamline data processing and decision-making, optimizing stock levels, and minimizing wastage and stockouts.

The expected outcome includes enhanced operational efficiency, reduced food wastage, and improved customer satisfaction.

Organization Background

Established in 2017, under the sole proprietorship by Mr. N Prasanth Kumar, 'Brew N Bistro' is a renowned local restaurant located in Beach Road, surrounded by the posh localities of MVP Major Place in Visakhapatnam. The images of the Brew N Bistro along with its location as mentioned in Appendix A.

The Brew N Bistro employs a total of 8 staff members which includes 3 chefs, 1 waiter, 1 cashier, and 3 helper/delivery.

They provide service through the methods below:

- **Dine-In and Takeout Services:** They cater to both sit-in customers and those who prefer to carry out their orders.

- **Collaboration with Leading Food Delivery Platforms:** They are collaborating with the popular food delivery platforms like Swiggy, Zomato, and Self-Delivery to expand the reach and offer delivery services to a wider customer base.

- **Home Delivery Service:** They offer free home delivery orders within the first 7 KM. The Brew N Bistro manages its online presence through an interactive website (www.bnbvizag.com/), enabling customers to view the menu, place orders, and access relevant information easily. The customers can also follow the 'Brew N Bistro' Instagram handle(Link).

Problem Statement

The business owner due to the high profits and satisfactory customer retention. On the other hand, inventory management is a pain in the neck because of the diverse nature of materials hence hard to keep track of. He may want to look into advanced inventory management software that allows for real-time location and generates automatic alerts when the inventory levels are running low. He may also want to perform regular audits on inventory control processes such as FIFO. It can also aid in detecting the usage patterns to increase the accuracy and reduce excess stock. Improved inventory management can bring efficiency and cost saving, which again helps in continuous growth and customer satisfaction.

Below is the list of problems in inventory management:

- **Inventory Tracking:** The fast-paced nature of a restaurant, combined with varying consumer consumption patterns, makes inventory management challenging. Tracking numerous materials with specific shelf lives can lead to wastage and stock discrepancies.

- **Classify Inventory Materials and Quantify Usage:** While the owner has rough estimates of stock levels, the lack of detailed classification for inventory materials can result in overstocking or understocking. By understanding the demand for different ingredients, the Brew N Bistro can make informed decisions to reduce food waste and optimize purchasing.

- **Minimize Operational Costs:** Due to the absence of an effective inventory management system, resources are underutilized, leading to financial waste. Identifying cost-saving opportunities and minimizing operational issues require addressing the inventory tracking and classification challenges.

Background of the Problem

Expanding the problem:

- **Classify Inventory Materials and Quantify Usage:** The owner relies heavily on rough estimates for most items, leaving unclassified items vulnerable to overstocking or

- understocking, which can lead to wastage. Perishable items, such as milk and bread, with short shelf lives, are at risk of going to waste due to inaccurate tracking. Relying on rough approximations can result in either excess inventory or shortages, causing food wastage or lost revenue from product unavailability.

- **Inventory Tracking:** Tracking inventory proves challenging due to the wide variety of items, including dairy, cheese, condiments, sauces, bakery items, and vegetables. Items like condiments come with bills, while those purchased from local wholesale markets, such as vegetables, often lack proper documentation, complicating tracking efforts. Additionally, the fluctuating costs of vegetables, influenced by weather conditions and rainfall, can lead to sudden price increases overnight.

- **Minimize Operational Costs:** Creating an effective, user-friendly inventory management system can streamline inventory processes, helping the Brew N Bistro optimize resource allocation, reduce wastage, and avoid unnecessary expenses.

The Brew N Bistro faces challenges in inventory tracking due to the diverse range of items and lack of proper documentation for some purchases. Implementing an easy-to-use inventory management system can address these issues, minimize operational costs, and improve resource allocation.

Problem-Solving Approach

To address the inventory management challenges faced by the Brew N Bistro, a comprehensive problem-solving data-driven and systematic approach is required. This approach encompasses a mix of methods, data collection strategies, and analysis tools, each justified for their role in optimizing inventory control and minimizing operational costs.

a. Methods Used

- The Brew N Bistro will adopt a data-driven approach, utilizing historical sales data and customer consumption patterns to forecast demand accurately. This will help in identifying which items are frequently ordered, enabling better inventory planning, and reducing wastage. Additionally, employing the ABC analysis method, categorizing inventory based on value and consumption, will prioritize critical items, ensuring optimal stock levels and avoiding stockouts for high-demand ingredients.

b. Intended Data Collection

- The intended data collection for inventory management includes:
    i. **Sales data:** The total number of items sold for each menu item.

ii. **Stock and inventory data:** Approximations and values for all purchased items.

iii. **Quantity data:** The owner is willing provide rough approximations of the quantities of ingredients used in preparing each menu item.

iv. **Historical Sales Data:** If the owner agrees to provide it then we will be able to identify demand patterns, seasonal variations, and predict future demands.

- This comprehensive data collection approach will be instrumental in quantifying consumption patterns, identifying popular items, and optimizing stock levels to minimize wastage and avoid stockouts.

c. Analysis Tools

- **Microsoft Excel:** Excel will be used as the central tool for the Brew N Bistro to manage its inventory data effectively. It allows to input, organize, and store inventory information, facilitating data manipulation, calculations, and generating tables for tracking stock levels and sales. The graphing and pivot table features help visualize trends and consumption patterns, enabling data summarization and analysis. Pareto charts aid in identifying significant inventory items contributing to sales or wastage, assisting in prioritizing efforts for inventory management.

- **Python and Machine Learning (ML) tools:** Python, as a versatile programming language, offers numerous libraries and frameworks, such as Pandas and NumPy, which provide robust data manipulation, processing, and statistical analysis capabilities. With Python, the Brew N Bistro can handle large datasets, perform complex calculations, and extract valuable insights from inventory data.

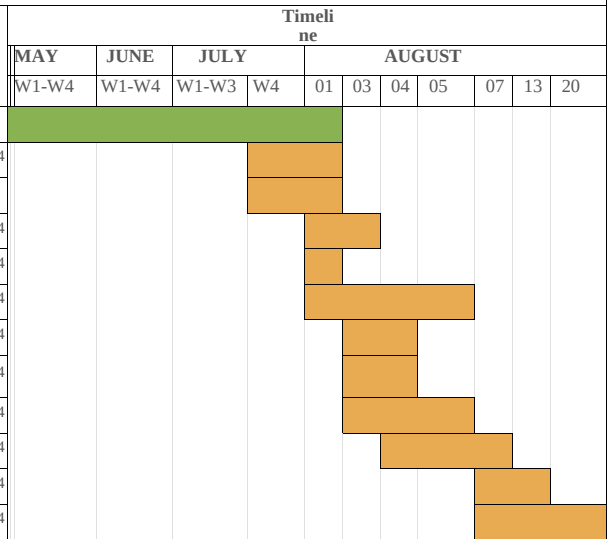
The combination of these methods, data collection, and analysis tools will create a robust inventory management system. It will empower the Brew N Bistro to make data-driven decisions, reduce wastage, optimize stock levels, and minimize operational costs effectively. The focus on accuracy and efficiency in inventory management will not only enhance customer satisfaction by ensuring product availability but also contribute to the Brew N Bistro long-term success and profitability in a competitive market.

Expected Timeline

The project is anticipated to be completed within the projected timeframe, aligning with the project cycle of August 2023. The workflow follows the structure outlined in the Gantt chart.

BDM Capstone Project

ACTIVITY	Start Date	End Date
Data Acquisition	01 May 2024	25 July 2024
Project Proposal and Scope Definition	01 August 2024	05 August 2024
Data Collection for Inventory Analysis	01 July 2024	29 J 2024
Data Preprocessing	02 August 2024	04 August 2024
Research on Inventory Management	01 August 2024	02 August 2024
Data Analysis and Identifying Inventory Problems	02 August 2024	05 August 2024
Collecting Additional Data	03 August 2024	04 August 2024
Analyzing and Evaluating Inventory Optimization Results	03 August 2024	04 August 2024
Preparing Mid-term Submission	05 August 2024	10 August 2024
Finalizing Analysis Process and Methodology	11 August 2024	13 August 2024
Preparing Final Submission	10 August 2024	15 August 2024
Creating Presentation	25 August 2024	30 August 2024



Expected Outcomes

The expected outcome of this inventory optimization project is to enhance Brew N Bistro financial performance and operational efficiency by effectively tracking and quantifying inventory, thereby reducing wastage and stockouts. This will result in minimized operational costs and improved customer satisfaction due to consistent product availability and quality. The project's success will also align with Brew N Bistro’s commitment to sustainability and responsible business practices by reducing food wastage. Ultimately, the implementation of this project will strengthen the Brew N Bistro competitive position and contribute to its long-term success in the food industry.

Appendix A

Images:



Location: https://maps.app.goo.gl/5mjkGD5VHzgvPUtQ8