INDIAN INSTITUTE OF TECHNOLOGY MADRAS

CHENNAI – 600 036

Data Insight: Analyzing Grocery Store Data for Enhanced Retail Strategies

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A Proposal report for the Business Data Management Capstone Project

Contents

Declaration Statement

I am working on a Project Title **"Data Insight: Analyzing Grocery Store Data for Enhanced Retail Strategies"**. I extend my appreciation to Mamta Kirana & General Stores, 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:

Name: Rounak Gupta

Date: 05/03/2024

Data Insight: Analyzing Grocery Store Data for Enhanced Retail Strategies

1. Executive Summary:

The project focuses on a retail grocery store named Mamta Kirana & General Stores, situated in Katni, Madhya Pradesh. The business, owned and operated by Mr. Kamla Prasad Gupta and Mr. Anand Kumar Gupta, is B2C (business to consumer) and primarily deals in retail consumer goods, focusing on food and other daily household items.

The major business issues that this business is facing are improper inventory management, price fluctuations, and margins. Stores also encounter customers who borrow products, leading to a loss of revenue and disruption of the store's operations.

These major challenges are addressed by analyzing sales and inventory data to minimize product wastage, while also prioritizing products with high profit margins and strong sales performance. As mentioned above, the store receives customers who borrow products with low assurance of returning them on time. This can be monitored by creating a list of trustworthy customers based on analysis from the past recorded data.

The expected outcome of this case study will assist the organization in reducing blocked funds, minimizing product wastage, managing inventory effectively, and prioritizing dealings with customers who have a high level of trust. These retail strategies will contribute to increasing the profitability of the shop.

2. Organization Background:

Mamta Kirana & General Stores, located in Katni, Madhya Pradesh, has been a cornerstone of the local community since its establishment in 1983 completing 41 years now. Owned and operated by Mr. Kamla Prasad Gupta and Mr. Anand Kumar Gupta. The shop owners are very kind and humble to

deal with their customers. They sale about all types of food items including packed food packets, snakes, drinks and beverages, and mainly milk products, rice, wheat flour, pulses, oil etc. The store not only caters to the everyday needs of its devoted customers but also warmly welcomes occasional visitors seeking quality products and personalized service. Compared to other nearby shops, this store offers high-quality products at affordable. Over the years, the store has built trust within the community for its fine quality products and services.

Store Location: https://maps.app.goo.gl/tJhFnNaRrN5HtzTT8

3. Problem Statements:

Following are the challenges faced by the shop:

3.1 Inventory Management: To reduce food wastage and maintain accurate inventory records, proper inventory management is crucial. This can be achieved by analyzing the store's inventory data, including sales and intake.

3.2 Net Profit Margins: Analyzing products with high profit margins to identify patterns and trends can lead to increased profits.

3.3 Prolonged Borrowing of products: Leading to inventory mismanagement and revenue loss. The store struggles to track borrowed items, resulting in uncertainty regarding stock availability and hindering the ability to meet customer demands effectively. This prolonged borrowing not only disrupts inventory management processes but also affects the store's revenue streams.

4. Background of the Problem:

Mamta Kirana & General Stores, located in Katni, Madhya Pradesh, has been a vital part of the community since 1983. Over the years, the business has established a reputation for providing high-quality products and customized attention to its loyal customers. Despite its lengthy history and devotion to customer happiness, the store has several obstacles that hamper operations,profitability.

One big problem is inventory management. With a diverse product offering, including perishable things such as fresh produce and packaged goods, the store struggles to keep correct inventory records. This creates a dual dilemma of food waste and stockouts, which affects both profitability and customer pleasure.

Furthermore, maintaining and expanding the business depend heavily on the analysis of net profit margins. The store may maximise its product offers and profit from opportunities by identifying products with high profit margins.

Customers' extended product borrowing is another urgent concern. This causes operational inefficiencies and revenue loss in addition to upsetting inventory management procedures. Despite the store's best efforts, monitoring borrowed items is still difficult, which makes it difficult to accurately meet client demands and creates uncertainty regarding stock availability.

5. Problem Solving Approach:

❖ **Details About the Methods Used with Justification:**

This will be the problem solving approach to overcome problems faced by the store. To reduce food waste and guarantee accurate inventory records, data analysis methods including trend analysis and inventory optimisation models will be applied to inventory management. In order to pinpoint high-profit products and enhance pricing tactics, profit margin research also makes use of financial measures and trend analysis. To address extended borrowing problems, list of customers is to created based on the trust level of that specific individual to reduce inventory mishandling and lost revenue. This strategy guarantees a planned and data-driven reaction to the difficulties that have been recognised, resulting in effective operations and long-term profitability.

❖ **Details About the Intended Data Collection with Justification:**

To effectively address the challenges faced by the shop, a detailed approach to data collection is essential:

1. Inventory Management: Gathering data on product sales, intake, and wastage from sales records, purchase invoices, and inventory logs. Parameters to investigate are product details, quantities sold, purchase dates, and reasons for wastage. After this analyzing data to identify sales trends and minimize food wastage.

2. Net Profit Margins: Collecting data on product sales and costs from sales data, from transactions and cost data, from invoices. Parameters to record product prices, costs, and calculate profit margins. Analysis of identifying profitable products and optimize pricing strategies.

3. Prolonged Borrowing: Tracking borrowing activities through a borrowing log. Record borrower information and borrowing details. Collecting data on borrowed items, borrower names, and return dates. Identifying patterns of prolonged borrowing and develop strategies to mitigate it.

By systematically collecting and analyzing data on inventory management, profit margins, and borrowing activities, the shop can make informed decisions to improve operations and address the identified challenges effectively.

❖ **Details About Analysis Tools with Justification:**

Ms Excel spreadsheets is one of the analysis tools used in this project for preliminary data arrangement and investigation. Python will be used for the following tasks, along with libraries like Matplotlib for data visualization, NumPy for numerical calculations. Spreadsheets provide an intuitive interface for preliminary data evaluation, but Python's vast libraries and adaptability make it perfect for thorough data analysis.
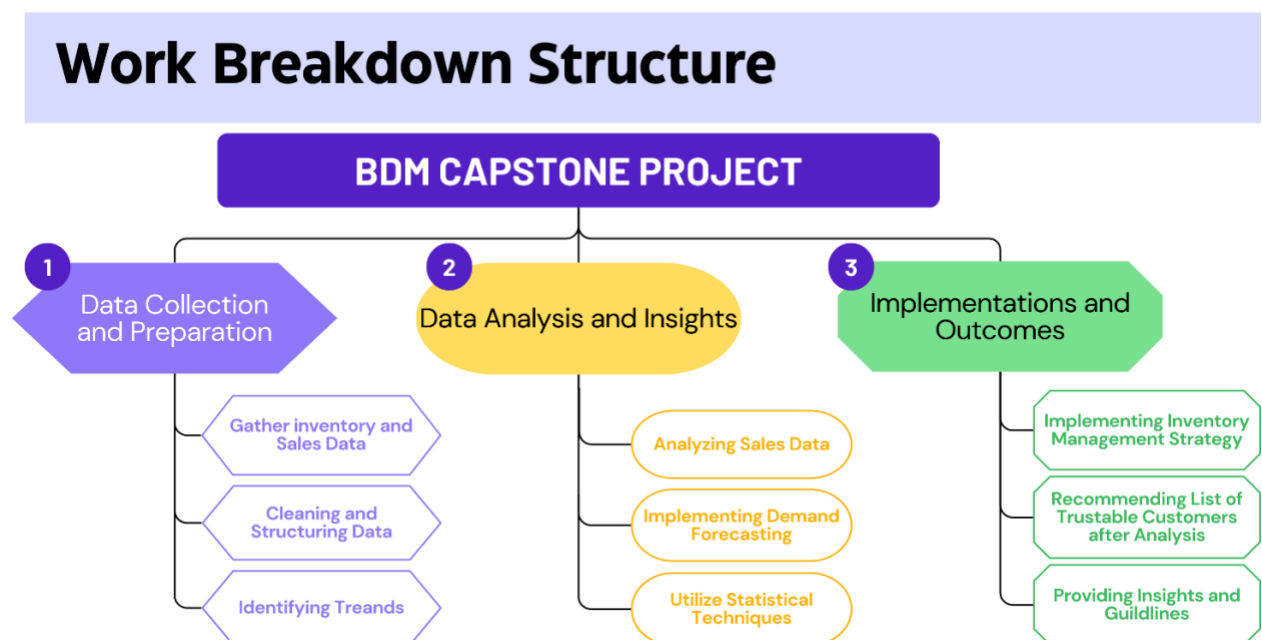
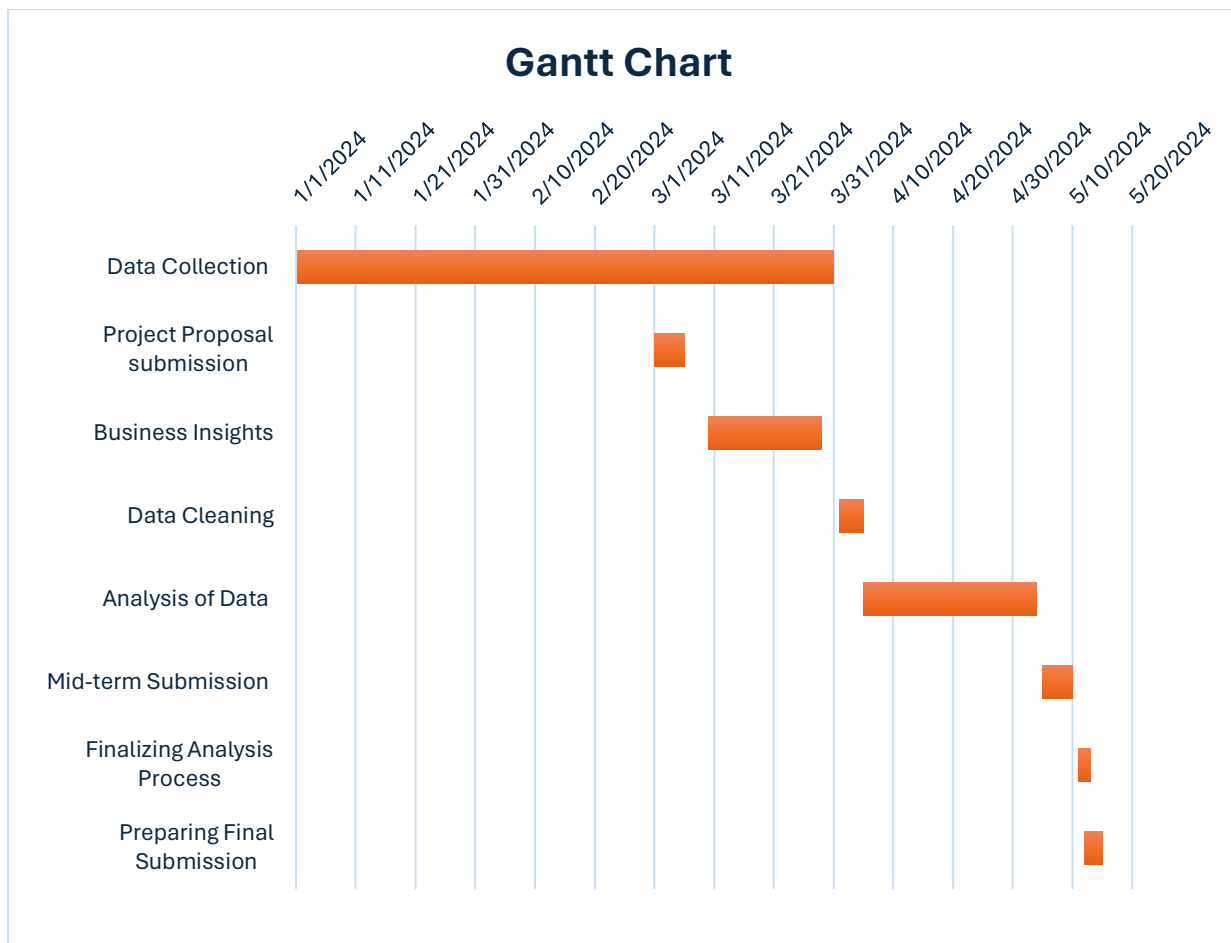**6. Expected Timelines:**

Figure 1. Work Breakdown Structure

Figure 2. Gantt Chart

7. Expected Outcomes:

The project's goal is to dramatically increase the store's operational effectiveness and profitability. This entails creating precise demand forecasting models, cutting down on inventory losses, and figuring out repayment patterns from customers. Finding trends and season analysis for sales. The ultimate objective is to boost profitability by building a solid, data-driven basis for the store's ongoing growth.