Optimizing Inventory Management and Supply Chain Efficiency to Minimize Dead Stock and Reduce Breakage

A Proposal Report for the BDM Capstone Project

Submitted by:

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Contents

Declaration Statement

I am working on a Project titled “Optimizing Inventory Management and Supply Chain Efficiency to Minimize Dead Stock and Reduce Breakage”. I extend my appreciation to **Spllatter,** 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 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: Aditya Nupani

Date: December 24, 2024

1 Executive Summary

Spllatter is a trading firm based in Kolkata, West Bengal which specializes in high-quality restaurant crockery, including durable porcelain and stoneware serve ware, dinnerware, cutlery and barware. Their products are designed to enhance dining experiences with elegant and functional designs, trusted by top chefs for their reliability and timeless elegance.

One of the major problems the firm is facing is large quantities of dead stock which is due to fluctuating demand for the designs imported by the firm. While some designs see high demand, others have little to no demand which leads to dead stock accumulation. The second problem faced by the business is breakage of goods both while importing as well sending the ordered products to the clients. This is mainly due to improper packaging of the products and manhandling the goods while transporting.

To address these issues, I plan to collect data on inventory levels, sales trends and design preferences to understand the demand patterns. Additionally, I also plan to collect purchase invoices and order shipping invoices along with the breakage data to understand how the problem is affecting the firm. I will use techniques like ABC analysis for inventory optimization and demand forecasting to predict the demand patterns throughout the year. Additionally, I will use root cause analysis to identify the key factors leading to breakage while transportation.

I will be using Microsoft Excel 2021 and Python as tools to perform a comprehensive analysis on the collected data. The insights obtained from this analysis will help the firm to optimize their inventory levels and reduce breakage while transportation.

2 Organization Background

Name: Spllatter

Key Person: Mrs. Kanupriyya Agarwal

Address: AA-87, Sector 1, Bidhannagar, Kolkata, West Bengal

Spllatter was started in 2022 as a supplier to retailers and eventually started supplying its products to restaurants, hotels and resorts across India. It is a B2B firm which imports its products like crockery, serve ware, woodenware, ceramic products and barware from China and supplies them to its clients. The clients of the firm are consultants who facilitate deals between hotels and sellers of such products and chefs. Some of its popular clients include Rambagh Palace, Fairfield by Marriott and Pebble Street Hospitality. This firm is popular among its clients for its durability and sophisticated designs. The firm consists of 6 employees and its operating hours are 10:00A.M – 6:00P.M.

3 Problem Statements

On visiting the firm's office and observing their operations, I have identified the following problems:

1. Minimizing inventory dead stock through demand-driven inventory management
   Minimizing the dead stock by implementing a demand-driven inventory management strategy involving analysis of the inventory levels in conjunction with the demand trends for design patterns throughout the year.
2. Reducing product breakage during transportation by enhancing packaging and logistics practices
   Reducing the product breakage during transportation by improving packaging and logistics practices supported by analysis of the transportation invoices and the packaging processes prior to shipment.

4 Background of the Problems

I have found that the main reason for dead stock is fluctuating demand for different designs in the products. Based on its research work, the firm acquires products of trending designs and sells them to its clients. Some designs are very popular for the first time but when they are sold out and ordered again, their demand decreases drastically. Another reason contributing to dead stock is that the goods can be imported in large quantities only so if a particular design does not sell, then that contributes significantly to dead stock in inventory. Fluctuating demand for different designs leads to accumulation of dead stock, which impacts the firm's profitability. Unsold inventory increases holding costs and ties up capital, which can be used for other profitable ventures. The firm also incurs losses due to breakage in the products both while importing and transporting to the clients. This is mainly due to improper packaging which is very crucial in transportation of sensitive goods made of porcelain and glass and manhandling by the transporters. Product breakage during transportation leads to direct losses for the firm due to the need for replacement, along with customer dissatisfaction which may harm the firm's reputation and result in decreased future sales.

Based on the identified problems, I have concluded that the best way to help the firm solve these problems is to analyze their inventory data, sales data and transportation invoices along with breakage reports to provide them with effective solutions to overcome the aforementioned problems.

5 Problem Solving Approach

5.1: Details about Intended Data Collection with Justification:

I intend to collect data on inventory levels, sales trends and design patterns for the analysis. The inventory levels and sales trends data will enable me to understand which designs and products contribute the most

to dead stock. In addition to this, analyzing sales trends will help to identify how product popularity changes over time, thus providing insights into shifting customer preferences.

I also intend to collect import invoices, order shipping invoices and breakage data to understand how it affects the firm financially. It will also enable me to understand if there are some recurring patterns contributing to product breakage such as specific routes, handling practices and packaging materials.

5.2: Details about the Analysis Tools with Justification:

I will primarily use Microsoft Excel 2021 for data cleaning and analysis. The invoices and inventory data are stored by the firm in Tally so the data will have to be extracted and transferred into Excel spreadsheets. Once the collected data is transferred to Excel, it will be cleaned where proper formatting will be done alongside removal of duplicate values. Excel's pivot tables will be used to group and filter the data effectively, and various charts (like pie, bar and line graphs) will be used for visualizing key insights. Additionally, the add-ins available in Microsoft Excel 2021 will aid me in the analysis.

For more complex tasks, I will be using Python libraries like pandas for quick data manipulation and matplotlib for better data visualization, if necessary. By utilizing Python and Excel, I will be able to thoroughly analyze the data and derive valuable insights, helping the firm address its problems effectively.

5.3 Details about the Methods used with Justification:

To address the identified issues, I will be using a combination of data-driven analysis methods. **ABC analysis** will categorize products based on their contribution to overall stock value, ensuring efficient inventory management and focusing on high priority items. **Demand forecasting** will help to predict sales trends for different product and design preferences throughout the year enabling better alignment of inventory with the market demand. This analysis will forecast the sales of various products and designs which will be helpful in identifying which designs and products to import which can help to reduce accumulation of dead stock. **Root cause analysis** will be used to identify specific reasons for breakage during transportation such as improper packaging and careless handling of goods thus helping to implement safer and effective transportations methods.

By analysis of shipping invoices, purchase invoices and breakage data, I aim to uncover the financial impacts on the firm and recurring patterns which exacerbate these issues. This comprehensive approach will allow me to provide insights on how to minimize dead stock and reducing the breakage during transportation, helping the firm to deal with these problems.

6 Expected Timeline

6.1 Work Breakdown Structure

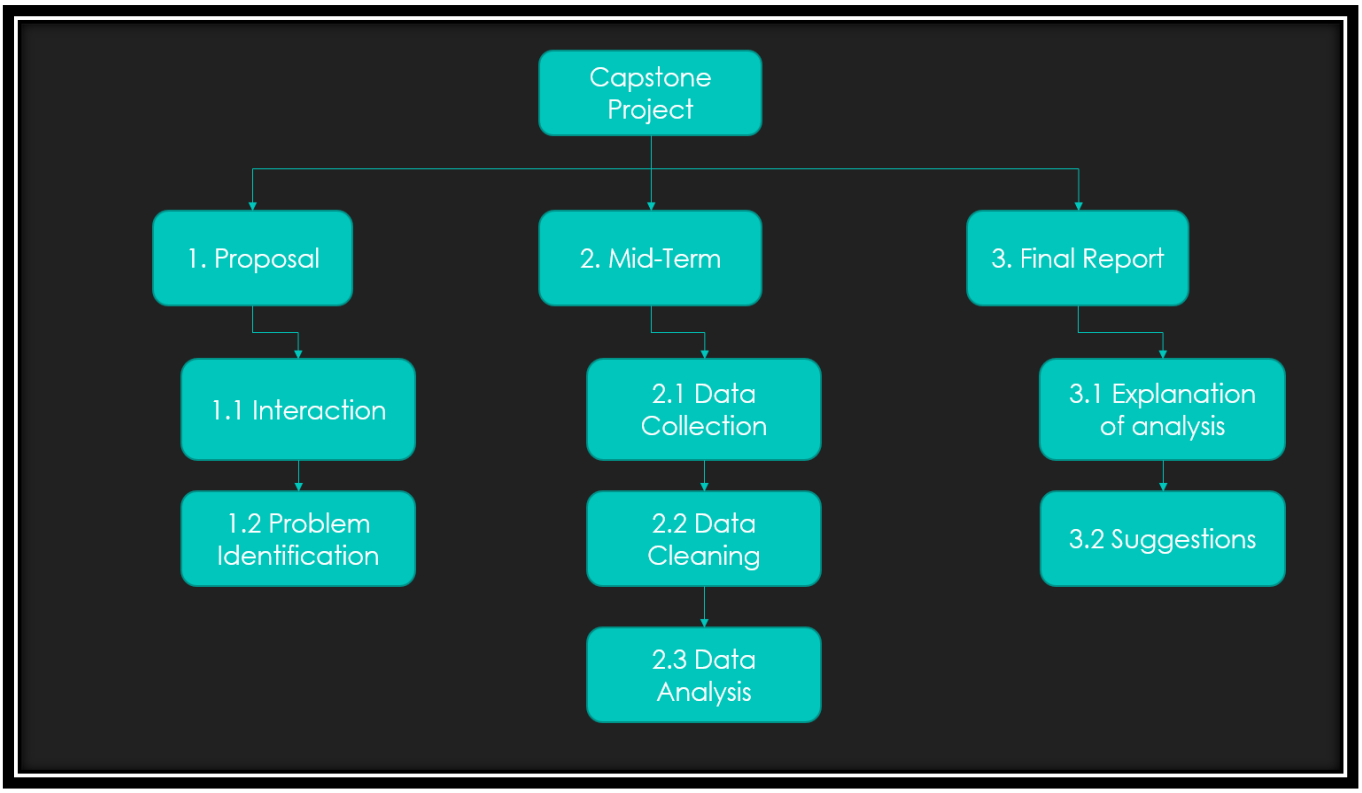

FIG 1A: Work Breakdown Structure (WBS) of Capstone Project

6.2 Gantt Chart

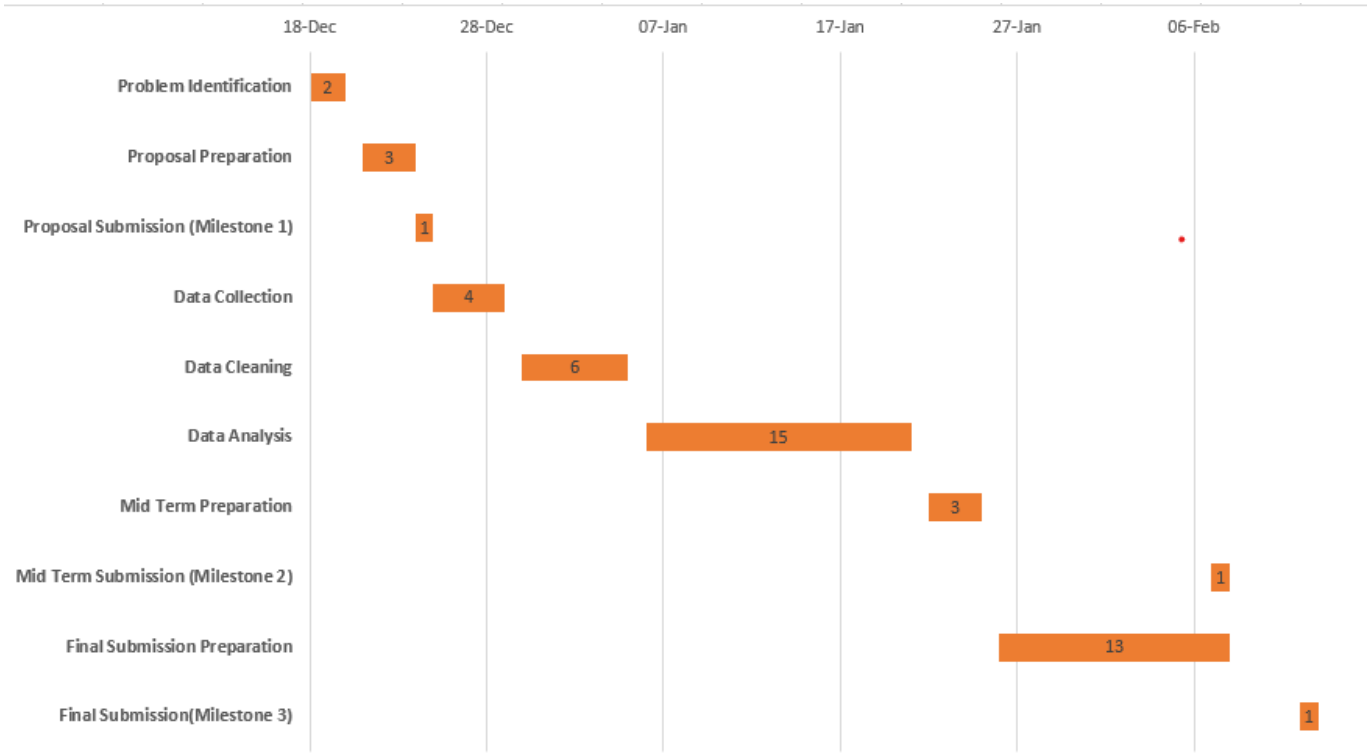

FIG 1B: Gantt Chart for the Project

7 Expected Outcome

- Analyzing inventory and sales trends data to identify what patterns and products are in demand at a particular time of the year.
- Reducing breakage of goods during transportation by identifying the key factors contributing to breakage.

On the basis of my project, I will be able to help the firm in the following ways: -

1. Minimizing the dead stock by identifying demand patterns across the year and suggesting better ways to research about demand trends before importing goods.
2. Reducing losses faced due to breakage of goods during transportation by suggesting improvised packaging techniques and safer transportation options.