Sales Pattern Analysis and Profit Maximation at Wind Spares Retail Shop

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled "**Sales Pattern Analysis and Profit Maximation at Wind Spares Retail Shop**". I extend my appreciation to Mr. Prakash for providing the necessary resources that enabled me to conduct my project.

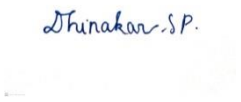
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

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: (**Digital Signature**)

Name: Dhinakar.S.P

Date:

1 Executive Summary

Gust Wind Spares and Services is a privately owned shop located in Gudimangalam. It operates as a B2B sector.

The shop faces challenges because of low profit margins due to the stock management issues caused by seasonal fluctuations. The Monsoon season awaits more potential customer due to High wind and change in spares. Also, the Stock management crashes during the period.

This project aims to address these challenges through a clear analysis of sales patterns and purchase requirements which progressively increases the profit. Data analysis and visualization of the trends could help in optimizing stock availability and analyze seasonal trends. The expected outcome will result in high return rates, satisfy stock demands and experience profit maximation for the business.

2 Organization Background

Business Name: Gust wind Spares and Services
Address: 6/18, Gudimangalam (Po) Udumalpet (Tk)-642201.
Owner's Name: Mr. Prakash

This private retail shop was established in 2011 which helps the local customers and companies by providing spares for the Windmills. This shop also provides service for its customers by fixing the spares at low cost unlike other nearby competitors. There are 3 employees in service end and the sales are taken care of by the owner itself.

Started the investment in 20-30 lakhs now had recognized itself into a successful merchant in the town of Gudimangalam. This shop was awarded as "**Best Supplier Award**" of 2019 by the i-Fox Windtechnik. Well-known for their supply of motors, screws and other mechanical tools related to the Gearbox. The stocks are purchased from the wholesale dealers of Coimbatore and are piled up for sales. The companies like RS Wind tech, Rajalakshmi Energy pvt ltd. are some of the regular customers.

3 Problem Statement

3.1 **Overstocking Low-Demand products -** The shop struggles to analyze sales patterns, leading to overstocking low-demand items and reduced profitability.

3.2 **Seasonal Demand Fluctuations** - Seasonal demand changes make it hard for the shop to manage inventory. During busy times, there aren't enough products, while in slow periods, too much stock sits unused, affecting the profits.

4 Background of the Problem

The shop faces challenges in effective use of inventory particularly of low demand products.

- One such example is screws which is a necessary item but is not significantly used at every time and is considered as a low demand product in annual basis. Also has very little profit margin.

Fig.4.1 Unused tools

Addressing this problem is mandatory to enhance profit margin by efficient stock purchases.

The windy season is from March to August and again at the end of the year is critical for shop as damage of parts become common. The sales reach peak at the time and necessary to replace which would also require proper service. It is important to accurately predict the stock and compensate with proper pricing strategies to attract a good range of customers. Necessary to reduce the risk of stock shortages.

5 Problem Solving Approach

Data Collection and Preparation:

- Relevant data including the Sales and Purchase data is to be collected which holds the data of the party name, date of purchase/sales, Item-name, Rate etc.
- Data cleaning is proceeded with handling missing values, correct any error data.

Exploratory Data Analysis (EDA):

- Use statistics to summarize metrics such as total sales, average item price, and quantity sold. Visualize data trends using charts like Pie chart, bar chart.

Sales Pattern Analysis:

- Analyze sales data by customer types and purchasing frequency. Find trends that determine peak sales periods and identify items with regular demands in respective to the seasonal fluctuations.

Inventory Management Analysis:

- Assess inventory turnover rates for each product to identify slow-moving items. Analyze stock levels against forecasted demand to highlight the overstock situations.

Demand Forecasting:

- Use regression models to forecast demand based on sales data. Usage of ML algorithms to identify period of high demand. Helps to know the availability of specific stocks at windy season

Analysis Tools:

- Analytical tools in Python (**libraries such as Pandas, NumPy, Seaborn and Matplotlib)** will be employed for data manipulation and visualization.
- **Power BI** will be used for presentation of insights.
- **Scikit-learn** will be used for implementing ML algorithms in dataset.

6 Expected Timeline

6.1 Work Breakdown:

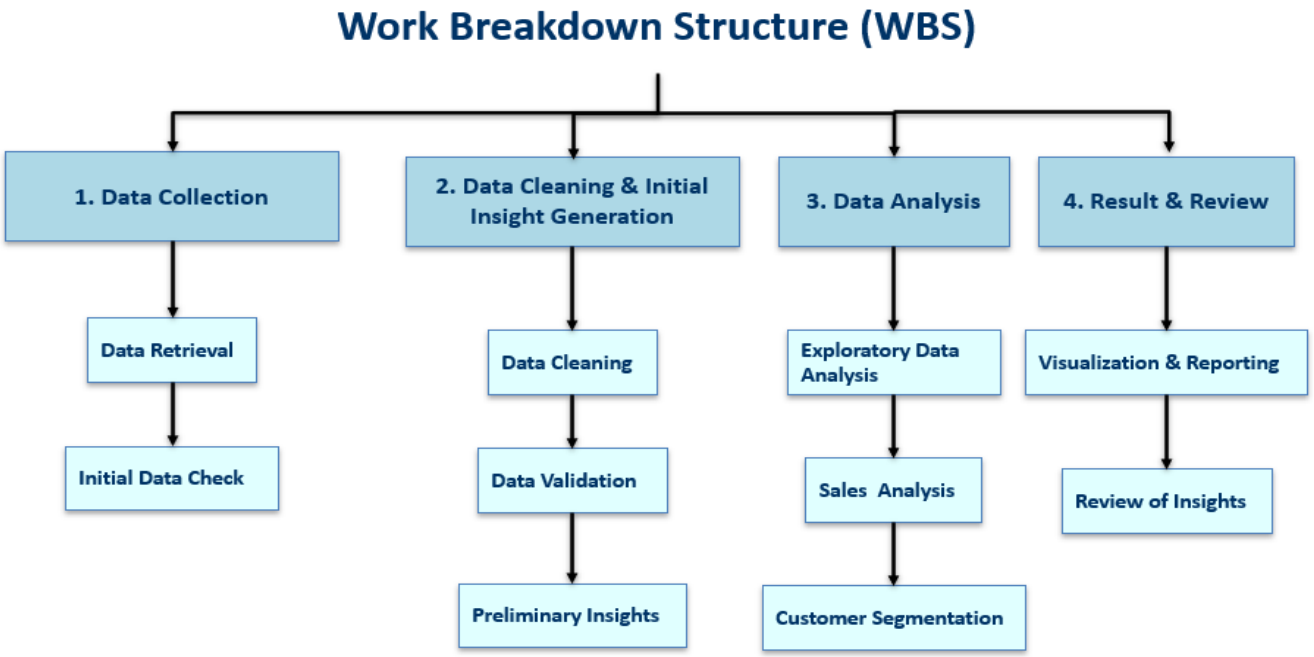


Fig.6.1. Work Breakdown Structure

6.2 Grantt Chart

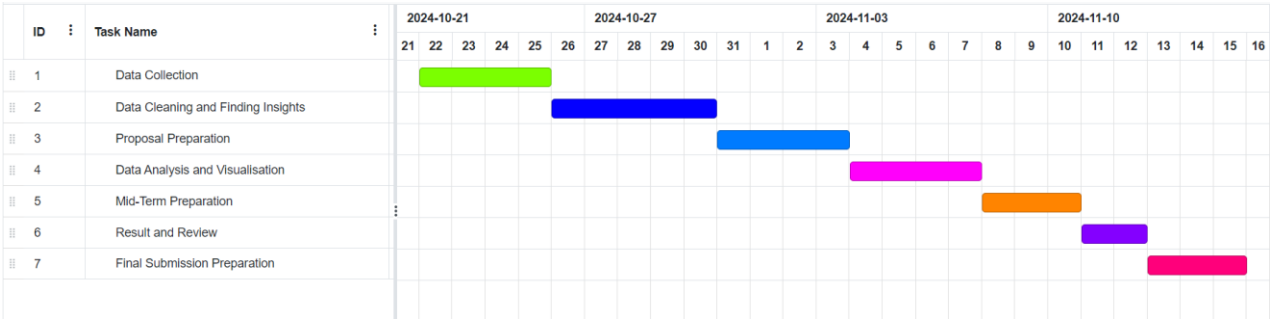


Fig.6.2. Grantt Chart

7. Expected Outcome

7.1 **Improved Inventory Planning:** By analysing sales and purchase data, the project will enable better inventory planning. This includes understanding which products sell the most, allowing the shop to maintain optimal stock levels and reduce excess inventory.

7.2 **High Profit Returns:** The analysis will identify the main reasons behind product sales and highlight which items have a high return percentage. This information can help the shop in bringing high profits despite the seasonal fluctuations

7.3 **Customer Distribution:** The project will provide a clearer view of the customer base like purchasing behaviours. Helps in evaluating marketing strategies to target potential customers.