Optimizing Inventory Management and Service Efficiency for an Automobile Parts Trading and Service Company

A Proposal report for the BDM capstone Project

Submitted by

Name: Hardik Jain

IITM Online BS Degree Program,

Indian Institute of Technology, Madras, Chennai

Tamil Nadu, India, 600036

Contents

1 Executive Summary and Title

The project focuses on a trading and service company, named “New Supreme Auto Engineering Works”, in the automobile parts industry. The business is B2C and deals in the segment of automobile parts, catering to both individual and commercial customers.

The company faces challenges in inventory management and service efficiency, resulting in frequent stockouts and service delays, which impact customer satisfaction and revenue.

This project aims to address these issues by collecting, and analyzing data to identify inefficiencies and propose solutions. Using descriptive, diagnostic, predictive, and prescriptive analysis, the project will provide actionable insights to optimize inventory levels, improve service delivery, and integrate operations between sales and service departments. These improvements are expected to enhance customer satisfaction, and reduce the operational costs.

2 Organization Background

New Supreme Auto Engineering Works was founded in 2010 aiming to provide high-quality automobile parts and Engine Re-Conditioning services to customers. The company operates in Udaipur and it provide genuine automobiles engine parts for reconditioning of automobiles engine and also provide Engine Servicing Services to customers. The company’s offerings include a wide range of automobile parts as Pistons, Bearings, Rings, Cylinder Liners and gasket etc and comprehensive repair services, catering to both individual and commercial customers. Its mission is to deliver reliable and efficient automobile solutions, ensuring customer satisfaction through quality products and exceptional service. The vision of New Supreme Auto Engineering Works is to become the leading provider of automobile parts and services in the region, known for its innovation, reliability, and customer-centric approach.

3 Problem Statement

3.1 Frequent Inventory Stockouts:

Frequent stockouts result in customer dissatisfaction and lost sales opportunities, negatively impacting revenue.

3.2 Delays in Service Delivery:

Service delays reduce customer satisfaction and retention, as customers face longer waiting times for repairs and services.

3.3 Outdated Inventory Management System:

The current inventory management system is outdated and fails to provide real-time data, leading to inefficient inventory handling.

3.4 Lack of Integration Between Sales and Service Departments:

Poor coordination between sales and service departments leads to miscommunication and operational inefficiencies, affecting overall performance.

Objectives:

1. To improve the efficiency of the inventory management system.
2. To enhance service delivery times.
3. To integrate sales and service operations to ensure better coordination and communication between departments.

4 Background of the Problem

The automobile parts and repair industry is highly competitive, requiring companies to maintain optimal inventory levels and efficient service processes to meet customer expectations. New Supreme Auto Engineering Works has experienced significant challenges that directly impact its ability to compete effectively in the market.

Major Causes of Problems

1. Frequent Inventory Stockouts:
   Frequent stockouts disrupt the supply chain, leading to lost sales and dissatisfied customers. These stockouts are primarily caused by inefficient inventory management practices and a lack of real-time data.

2. Delays in Service Delivery:
   The service department struggles with uncoordinated workflows and inadequate resource allocation, causing delays in service delivery. These delays reduce customer satisfaction and retention, as customers face longer waiting times for repairs and services.

3. Outdated Inventory Management System:

The current system lacks modern features like real-time tracking, automated reorder alerts, and data analytics. This leads to poor decision-making and inefficiencies in inventory handling due to the lack of accurate and timely information.

4. Lack of Integration Between Sales and Service Departments:
   There is a disconnect between sales and service departments, causing miscommunication and inefficiencies. Without a unified system, teams work with outdated information, leading to scheduling conflicts and delays in service delivery. Improved integration is needed to ensure seamless information sharing and enhanced performance.

Addressing these issues requires a comprehensive approach to data management and process optimization, ensuring that company can meet customer demands efficiently and maintain a competitive edge in the market.

5 Problem Solving Approach

To address the company's challenges, we will use a systematic approach that includes root cause analysis, data cleaning and processing, and various analytical methods. **Here are the steps and methodologies**:

1. **Root Cause Analysis**: Identify underlying factors causing stockouts, service delays, and inefficiencies using tools like Fishbone Diagram and 5 Whys to explore potential causes.
2. **Data Cleaning and Processing:** Ensures data quality and accuracy, removing inconsistencies and errors.
3. **Descriptive Analysis:** Provides a summary of the data, identifying key patterns and trends. It helps in understanding the current state of inventory and service operations.
4. **Diagnostic Analysis:** Identifies root causes of stockouts and delays, essential for targeted interventions. This step helps pinpoint specific issues that need to be addressed.
5. **Predictive Analysis:** Forecasts future demand and inventory needs, allowing proactive management. This helps in planning inventory levels to avoid stockouts.
6. **Prescriptive Analysis:** Offers actionable recommendations based on the analysis, ensuring practical solutions. This step provides strategies to optimize inventory and service processes.

Details about Intended Data Collection:

- **Inventory Data:** Opening stock, closing stock, purchase orders, lead times, and stockout incidents.
- **Sales Data:** Sales transactions, customer orders, demand forecasts, and buying patterns.

- **Service Data:** Service requests, repair times, customer feedback, and service outcomes.

Analysis Tools:

- **Python:** For data cleaning, processing, and advanced analytics.
- **Microsoft Excel:** For basic data analysis and visualization.
- **Tableau:** For interactive and comprehensive data visualization.
- **Power BI:** For creating dashboards and reports.

6 Expected Timeline

6.1 Work Breakdown Structure:

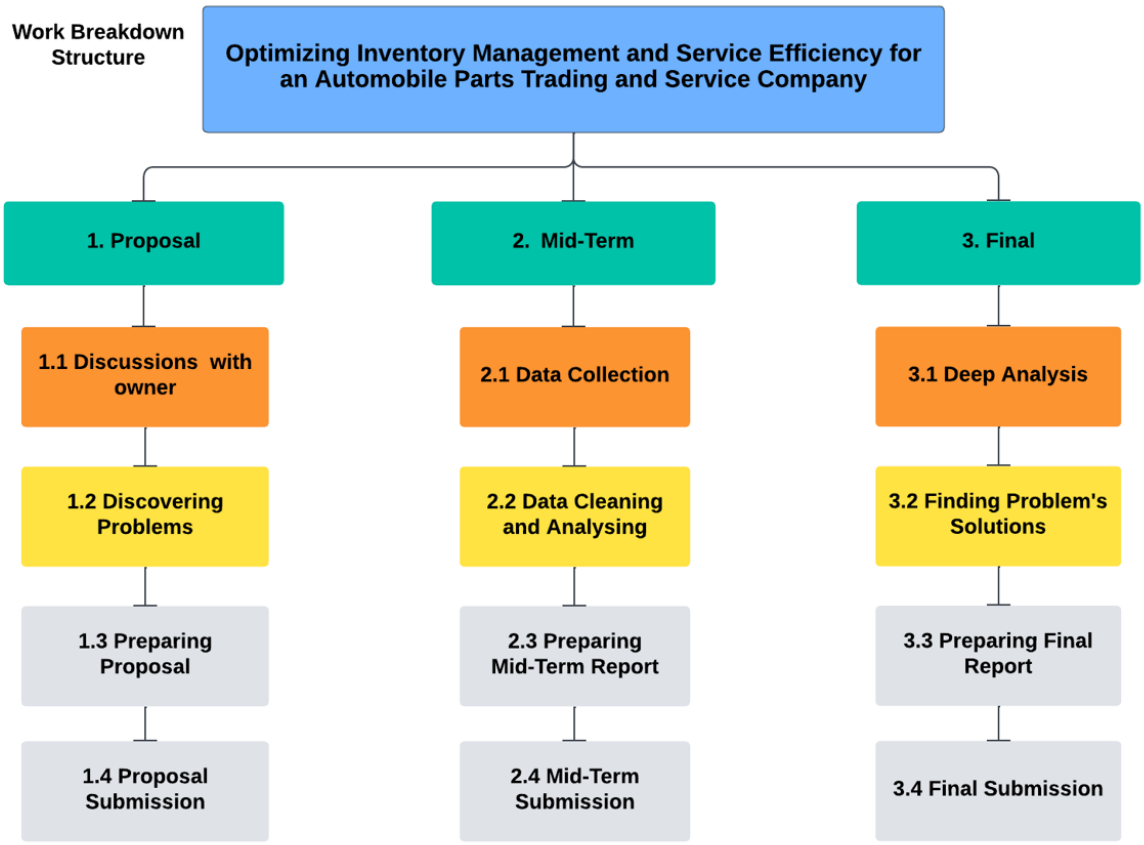

Figure 1 Work Breakdown Structure of project.

6.2 Gantt chart

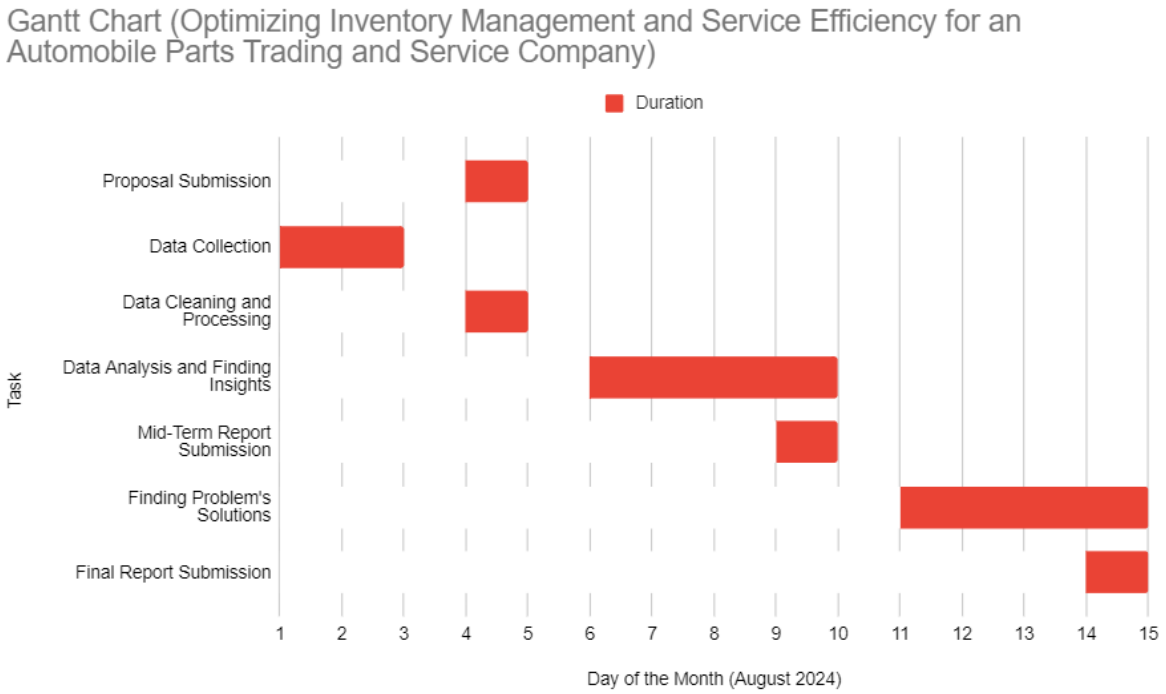

Figure 2 Gantt Chart of project.

7 Expected Outcome

The expected outcomes of this project include:

1. **Optimized Inventory Levels:** Recommendations for maintaining optimal stock levels to prevent stockouts and reduce holding costs.
2. **Improved Service Efficiency:** Process improvements to reduce repair times and enhance customer satisfaction.
3. **Integrated Operations:** A framework for better coordination between sales and service departments to streamline operations.

These insights will be derived from data analysis and are expected to provide actionable solutions to the identified issues, ultimately helping New Supreme Auto Engineering Works improve its inventory management and service efficiency.