

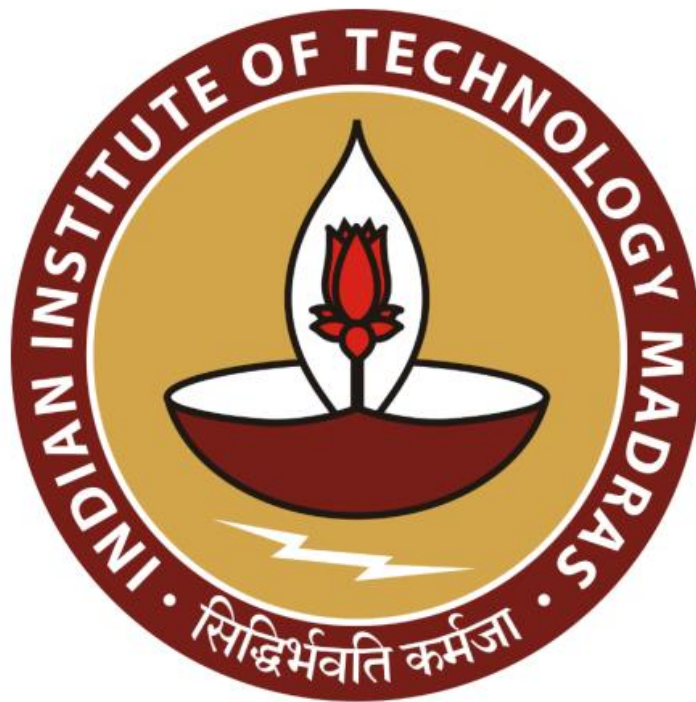
**Title: Enhancing Profitability for a Local Automotive Spare Parts
Vendor and Garage Service**

A Proposal report for the BDM capstone Project

Submitted by

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Contents

1.Executive Summary:	3
2. Organization Background	3
3. Problem Statement	3
4. Background of the Problem	4
5 Problem Solving Approach	5
6. Expected Timeline	6
6.1 Work Breakdown Structure:	6
6.2 Gantt chart	7
7. Expected Outcome:	7

Declaration Statement

I am working on a Project titled **Enhancing Profitability for a Local Automotive Spare Parts Vendor and Garage Service**. I extend my appreciation to **Pawansut Automobiles** 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 from 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 principles 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 understand that all recommendations made in this project report are within the context of the academic project taken up towards course fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.



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Date: 05-08-2024

1.Executive Summary:

This capstone project is focused on increasing business growth and enhancing operational efficiency of the Pawansut Automobiles shop. It focuses on a local vehicle parts vendor and garage service. Both of these are major participants in the vehicle repair industry.

Right present, the provider is dealing with some significant issues. Profit margins are poor mostly due to surplus inventories. Inefficient sales tracking and bad customer retention techniques exacerbate the problem. All of these issues have contributed to financial instability, which is impeding corporate growth.

To address these issues, a comprehensive strategy to data management and analysis has been proposed. This will include collecting and evaluating sales and inventory data to identify inefficiencies and gaps. This analysis will make use of advanced methodologies such as inventory optimization models, sales forecasting, and customer behavior research.

The goal is to improve the vendor's operations by implementing these tactics. One of the primary goals is to reduce inventory expenses. Ultimately, we expect to increase profitability. The expected result is a streamlined, profitable business model ready for enduring success in the competitive automotive market.

2. Organization Background

The organization in concern is a local two-wheeler garage and spare parts vendor in Chandrapur, Maharashtra. The Balki family started the business in 2017 as a small cycle repair shop in their own garage. The family's small-scale operation, having a passion for motorcycles and a strong dedication to their area of work, grew into a well-known local business. Over time, the garage has expanded to provide a full range of two-wheeler maintenance services and automotive replacement parts. Despite its development and established reputation, the company confronts problems in terms of profitability and operational efficiency. The Balki family, known for their passion and hands-on approach, is now using data-driven tactics to revitalize their operations. Their goal is to streamline procedures, improve financial performance, and assure the long-term viability of their company in a competitive automotive market.

3. Problem Statement

1 Inventory Inefficiency:

The garage faces critical inventory management inefficiencies, characterized by excess stock of some parts and frequent stockouts of others. This issue is due to inadequate utilization of data-driven inventory optimization techniques. By deploying advanced analytics and predictive modeling, we will analyze inventory turnover, demand forecasts, and real-time stock data to enhance inventory alignment with actual demand, reduce holding costs, and minimize stockouts.

2 Sales Data Analysis:

The garage struggles with suboptimal sales due to insufficient insights into trends and customer behavior. Applying data mining and predictive analytics will uncover actionable insights, enabling optimized sales strategies and improved revenue.

3 Customer Retention Challenges:

The garage struggles with customer retention due to limited insights into engagement and loyalty parameters. By using advanced customer segmentation and behavioral analytics, interaction data and feedback will be analyzed to create targeted retention strategies and personalized marketing campaigns, henceforth improving customer loyalty and reducing churn.

4. Background of the Problem

1. Inventory Inefficiency

The garage has some big issues with its inventory. For one, there's often too much of certain spare parts. At the same time, they frequently run out of others. This problem comes from not using data properly to optimize inventory. Plus, there's no real-time tracking or predictive analytics in place. This makes it tough to forecast demand accurately & manage inventory well.

The problem arises from lack of integration, inadequate forecasting tools, and reactive inventory practices.

Key Factors Affecting the Problem:

- Internal Problems: The current inventory systems are outdated. There's also a lack of data integration & practices that aren't proactive enough.
- External Problems: Market demand fluctuations, supplier reliability issues, and consumers' preferences can shift unexpectedly

2. Sales Data Analysis

Sales performance isn't where it should be. This issue comes from not having enough insights into trends & customer behaviour. There are not enough advanced data analytics tools. Fragmented sales data makes sales strategies less effective.

The root of the problem lies in the lack of strong business intelligence tools, poor methods for collecting data, & insufficient strategic use of that data. A centralized system is really needed. Without it, the garage finds it hard to spot patterns or accurately predict demand. This also means marketing efforts aren't as effective as they could be. As a result, they miss opportunities for promotions that could be targeted more carefully and cannot optimize their product offerings well.

Key Factors Impacting This Problem:

- Internal Issues: Lack of investment in advanced analytics tools, problems with data integration, and underutilized CRM systems.
- External Issues: High market competition, changing consumer preferences, & nd economic conditions affecting purchasing behaviour.

3. Customer Retention Challenges

Customer retention faces challenges due to weak insights into engagement & loyalty metrics. There's a real lack of detailed customer data. Additionally, limited CRM capabilities plus ineffective retention strategies make this issue even worse. Without advanced customer analytics and steady engagement practices, the garage has a hard time grasping what customers want and how they behave. This leads marketing efforts that just don't hit the mark.

This problem mainly arises from inadequate customer analytics, inconsistent engagement with customers, & very less integration of CRM.

Key Factors Behind the Problem:

- Internal Issues: Poor CRM systems, poor customer data management, & no targeted retention strategies.
- External Challenges: More competition out there, changing expectations from customers, and economic factors impacting customer loyalty.

5 Problem Solving Approach

1. Inventory Inefficiency:

- **Advanced Demand Forecasting:** Employ industry-standard data analysis tools. For forecasting future inventory needs, you can use time analysis & moving averages. Look at previous sales, seasonal changes, and market trends. Trend analysis helps ensure proper stock levels. It can help avoid both stocking and stockouts while enhancing inventory management.
- **Adopt Just-In-Time (JIT) Inventory Practices:** With JIT, you can align inventory better with actual demand. Use demand forecasting and usage pattern analysis to make sure that parts with low sales volume—like high-value precision-engineered components are supplied only when necessary for specific maintenance tasks. This method minimizes excess inventory, cuts down on holding costs, and guarantees that essential components are available when needed. Overall, it boosts operational efficiency while reducing waste.
- **Regular Inventory Audits:** Implement a centralized digital platform for real-time inventory data capture & updates. This ensures accurate tracking along with early detection

of inconsistencies. In turn, it leads to ongoing improvements in your inventory management methods.

2. Sales Data Analysis:

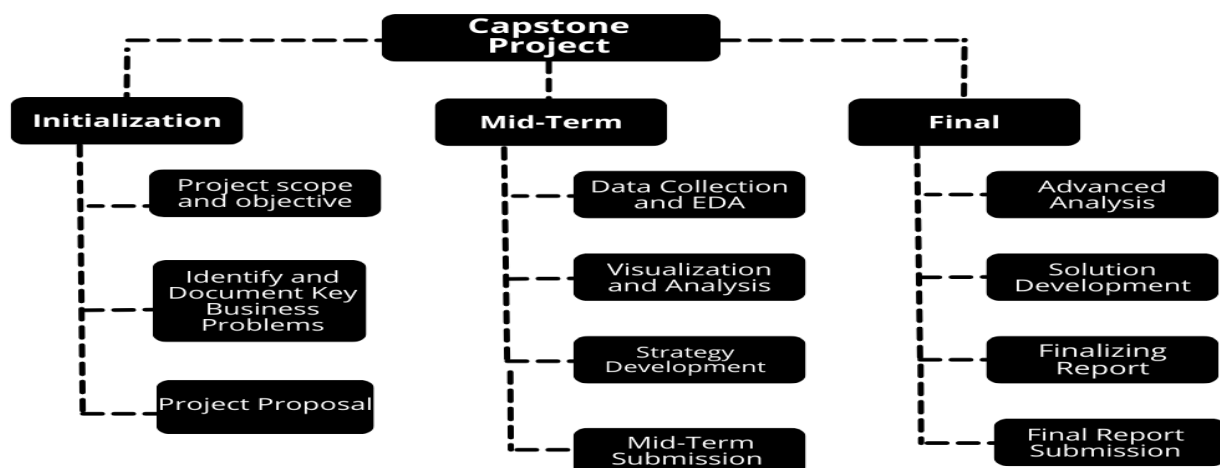
- **Data Mining and Pattern Recognition:** Combine modern data mining techniques with pattern recognition approaches. This requires pivot tables and other filtering in data analysis tools. Trend analysis is also vital! Using moving averages and seasonal decomposition, we can extract meaningful lessons from previous sales data. These strategies aid in the discovery of major trends and the comprehension of consumer behavior. This understanding makes it easier to identify sales possibilities and refine plans based on reliable data insights.
- **Predictive Sales Analytics:** Make use of predictive analytics techniques like logistic regression (mathematical models). This improves pricing tactics and helps find very high-margin products efficiently. With logistic regression models, we can better predict client preferences. Product recommendations of these items improve sales profit, which in-terms leads to increased income. Data-driven decisions can increase profitability as a result.

3. Customer Retention Challenges:

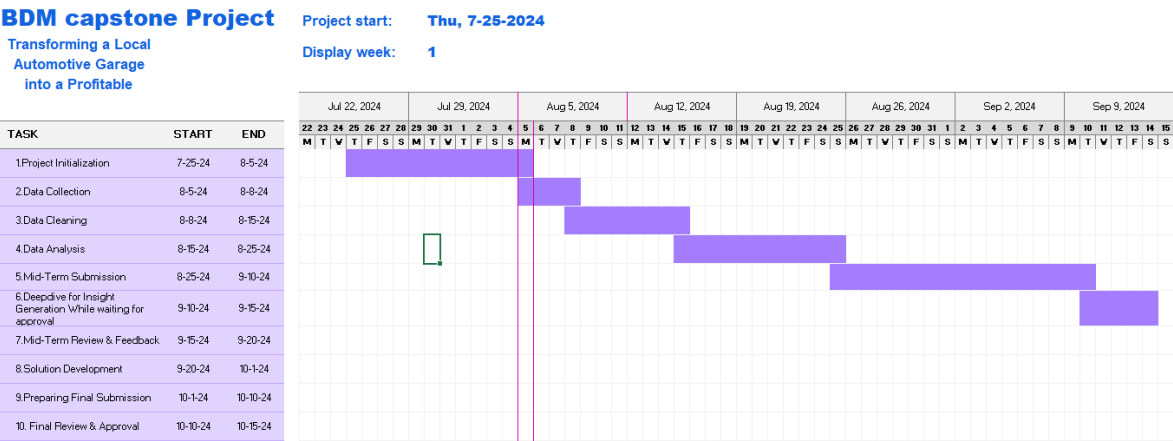
- **Product Recommendation Analysis:** Utilize market basket analysis techniques to recommend other products based on previous purchase patterns. By applying association rule mining (e.g., Apriori algorithm), identify frequently together purchased items and suggest relevant products to customers. This approach enhances cross-selling opportunities, increases average order value, and improves customer satisfaction through personalized recommendations.

6. Expected Timeline

6.1 Work Breakdown Structure:



6.2 Gantt chart



7. Expected Outcome:

- ☐ Optimized Inventory Management
 - Precision Inventory Alignment: Using advanced analytics, stock levels will be aligned with demand estimates. This reduces overstocking and stockouts while also lowering storage costs.
- ☐ Enhanced Sales Performance
 - Data-Driven Sales Strategies: Insights gained from sales trend research can aid in targeted marketing initiatives. This will improve product offerings, boost revenue, and refine promotional strategies.
- ☐ Improved Customer Retention
 - Targeted Engagement Programs: Advanced consumer segmentation and behavioral analytics lead to personalized retention strategies. This improves client loyalty and lowers churn.
- ☐ Insights into Return Patterns
 - Return Rate Analysis: Identification of high-return products and underlying causes will lead to improved quality control and product adjustments.
- ☐ Informed Decision Making
 - Strategic Data Utilization: Comprehensive data insights allow for more informed strategic decisions. This not only increases profitability, but also improves operational efficiency.