

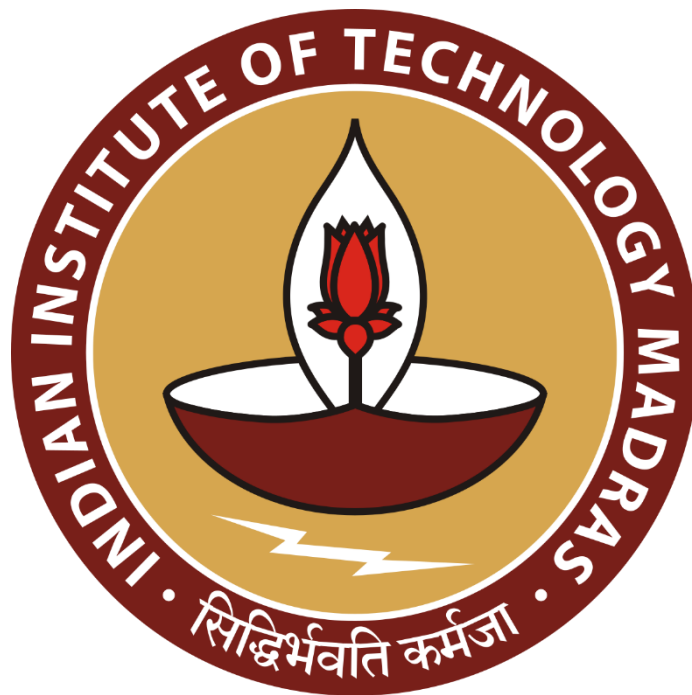
Optimizing Plywood Business Operations Using Data Analytics

A Proposal report for the BDM capstone Project

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Declaration Statement

I am working on a Project titled “**Optimizing Plywood Business Operations Using Data Analytics**”. I extend my appreciation to **AARAMBH TRADERS**, 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 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.

Signature of Candidate:



Name: Punit Kumar

Date: 03/02/2025

1 Executive Summary and Title

The project focuses on **Aarambh Traders**, a plywood distributor located in Nuaon, Kaimur, Bihar. This is an B2B business that sells plywood to distributors across Kaimur and some parts of Bihar and Uttar Pradesh.

The plywood distribution business struggles with inventory management, price fluctuations, and delayed customer payments. Poor demand forecasting leads to stock shortages or excess inventory, affecting profitability. Unstable raw material prices create pricing uncertainties, while late payments disrupt cash flow.

This project, "**Optimizing Plywood Business Operations Using Data Analytics**," addresses these challenges using data-driven insights. Sales trend analysis helps predict demand, ensuring balanced stock levels. Price tracking enables better pricing strategies, while credit risk analysis minimizes payment delays.

By leveraging business intelligence and predictive analytics, this project aims to streamline operations, improve financial stability, and enhance decision-making. The outcome will be optimized inventory, competitive pricing, and improved cash flow, ultimately leading to business growth.

2 Organization Background

Company Name : **AARAMBH TRADERS**

GST No. : 10AKQPK0590B1ZM

Owner Name : Manish Kumar

Location : Nuaon, Kaimur, Bihar

Industry : Plywood Distribution and Trading

Aarambh Traders is a plywood distribution business located in Nuaon, Kaimur, Bihar. The company supplies plywood, laminates, and related wood products to retailers, furniture makers, construction businesses, and interior designers. It focuses on wholesale trading, ensuring a steady supply of quality materials at fair prices.

The company works closely with manufacturers and suppliers to source plywood in bulk and deliver it to clients efficiently. Aarambh Traders also provides customized orders and flexible payment options to support businesses. By maintaining a reliable stock and ensuring timely deliveries, it helps customers meet their project needs without delays.

Aarambh Traders aims to expand its reach and improve operations using smart inventory management, pricing strategies, and better credit control. The company's goal is to offer consistent service, strong business relationships, and financial stability, making it a trusted name in the plywood distribution market.

3 Problem Statement (Listed as objectives)

- 3.1 **Demand Forecasting and Inventory Management** : The business struggles with accurately predicting future product demand, leading to issues like stock shortages or excess inventory, which affects its ability to meet customer needs and manage resources efficiently.
- 3.2 **Price Fluctuations & Profitability Management** : The business faces difficulty in tracking and responding to fluctuations in product prices, which impacts its ability to maintain consistent profit margins and navigate market volatility effectively.
- 3.3 **Customer Credit and Payment Delays** : The business faces difficulties in managing customer credit and tracking overdue payments, leading to delayed collections and poor cash flow management, which negatively impacts the business's financial stability and healthy cash flow.

4 Background of the Problem

After speaking with Mr. Manish Kumar, the owner of Aarambh Traders, it became apparent that several key challenges are affecting the smooth functioning of the business. The first major issue is demand forecasting and inventory management, where the company struggles to accurately predict customer demand. As a result, they either face stockouts or excess inventory, both of which lead to inefficiencies and lost sales. Proper management of inventory is crucial, and this misalignment impacts the business's ability to meet customer needs in a timely manner.

Another problem is the price fluctuations and profitability management. The prices of raw materials keep changing, which makes it difficult for Aarambh Traders to set consistent pricing for their products. This volatility affects their ability to manage profit margins effectively. Without stable pricing, the business finds it hard to maintain profitability while staying competitive in the market.

Lastly, customer credit and payment delays have also been causing financial strain. Some customers take credit and fail to make timely payments, which disrupts cash flow and prevents the business from maintaining a steady working capital. To manage this, it is essential for Aarambh Traders to assess customer creditworthiness and establish appropriate credit limits for each customer. This way, the business can minimize payment delays and ensure a healthier cash flow for smoother operations.

5 Problem Solving Approach

1. **Data Cleaning** : The first step in data analysis is cleaning the data to ensure accuracy and completeness. This involves identifying and correcting any errors or inconsistencies in the dataset. Outlier detection helps spot unusual data points that could distort the analysis, allowing the proper adjustments. Additionally, if any data is missing, imputation techniques are used to fill in the gaps, ensuring that the dataset remains reliable. A well-structured and clean dataset is essential for making informed and accurate business decisions.
2. **Time-Series Analysis** : Time-series analysis is all about looking at data over time to see trends or patterns. For a plywood business, this means studying past sales and price data, whether weekly, monthly, or yearly, to understand when demand is typically high or low. For example, if sales tend to increase during construction seasons or in certain months, the business can plan ahead by adjusting its inventory and pricing strategies accordingly. By understanding these patterns, the business can ensure it has enough stock during busy times and avoid shortages.
3. **Market Analysis** : Market analysis involves understanding external factors that affect the plywood business, like changes in raw material prices, customer demand in related industries (such as construction or furniture manufacturing), and any economic or environmental factors that could impact supply. For instance, if there is a shortage of raw materials or if a new construction boom is expected, this could drive up plywood prices or demand. By analyzing these factors, the plywood business can adapt its strategy, such as locking in prices with suppliers or adjusting its pricing to maintain profitability.
4. **Historical Sales Data Analysis** : Looking at past sales data helps the business understand when demand is typically higher or lower. For example, sales might increase during certain months or in response to market trends. By identifying these seasonal trends, the business can plan better by increasing stock during busy times and reducing it during slow periods. This helps avoid situations where there's not enough stock to meet demand or too much unsold inventory that ties up cash flow.
5. **Statistical Modeling** : Statistical modeling uses mathematical models to predict future outcomes based on historical data. For the plywood business, this could involve using past sales data, market conditions, and other factors to forecast future demand and price trends. By using models like time-series forecasting or regression analysis, the business can predict when demand will increase or decrease, helping to plan inventory and pricing strategies. This ensures the business can make data-driven decisions to manage risks, optimize profit, and meet customer needs efficiently.

6 Expected Timeline

6.1 Work Breakdown Structure:

Task	Start Date	End Date
Collecting Data	03-02-2025	10-02-2025
Data Cleaning	11-02-2025	15-02-2025
Finding Insights	16-02-2025	28-02-2025
Preparing Midterm Submission	01-03-2025	07-03-2025
Finding more Insights while waiting approval	08-03-2025	16-03-2025
Midterm Approved	13-03-2025	14-03-2025
Finding Problem's Solutions	17-03-2025	31-03-2025
Preparing Final Submission	01-04-2025	10-04-2025
Preparing Slide while waiting for Final Approval	11-04-2025	20-04-2025
Final Approved	17-04-2025	18-04-2025

6.2 Gantt chart

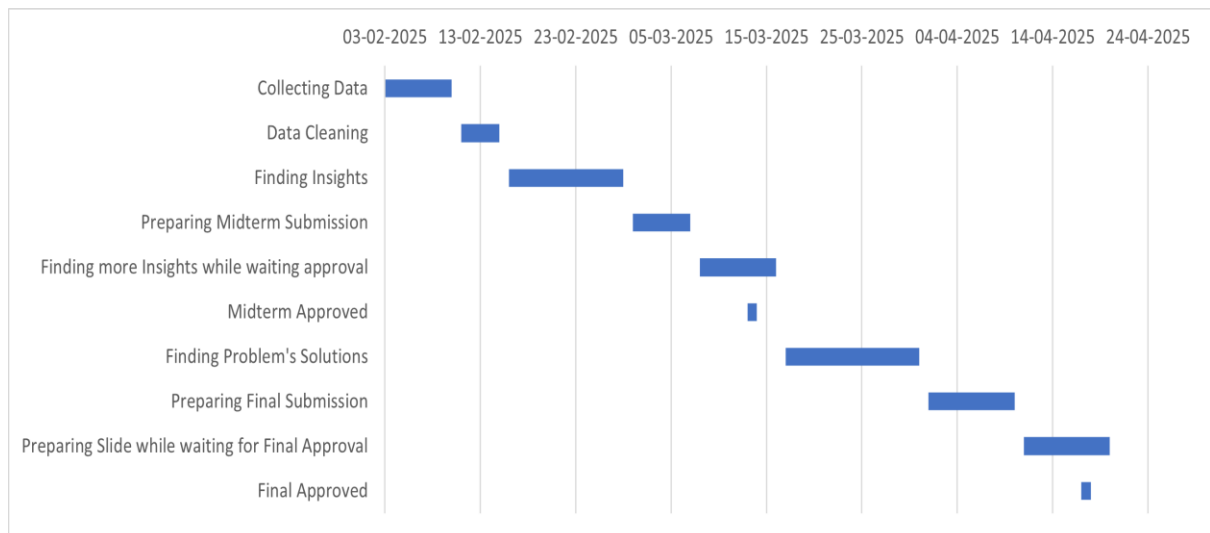


Figure - Expected timeline for completion of project.

7 Expected Outcome

- 7.1 **Improved Inventory Management** : Accurate demand forecasting ensures optimal stock levels, preventing both stockouts and overstocking, which helps in meeting customer demand effectively.
- 7.2 **Optimized Profitability**: By managing price fluctuations and setting competitive prices, the business can maintain healthy profit margins and stay financially stable, even in fluctuating market conditions.
- 7.3 **Better Cash Flow Management**: Analyzing customer credit and payment delays helps in setting appropriate credit limits and reducing overdue payments, ensuring smooth cash flow for the business.