Data-Driven Problem Solving for a Growing Trading and Distribution Business

A Proposal report for the BDM capstone Project

Submitted by

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Contents

Declaration Statement

I am working on a Project titled “Data-Driven Problem Solving for a Growing Trading and Distribution Business”. I extend my appreciation to Greenaway Enterprises LLP, 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: Abhinav Saxena

Date: 12/05/2025

1 Executive Summary

Greenaway Enterprises LLP, located in Kanpur – Uttar Pradesh is a B2B trading and distribution firm that supplies plastic, chemicals and rubber-based materials like Low-density polymer, calcium carbonate, toluene and Methyl ethyl ketone. It supplies these materials to small manufacturers, through a just-in-time delivery model.

The business owner faces three key challenges: high dependency on a few clients, rising inventory carrying costs, and frequent changes in raw material prices that impact profit margins. Due to this, business is slowly experiencing difficulties in managing its working capital. These problems are impacting business daily operations, limiting growth and threatening long term stability.

To help the business to grow and maintain long-term sustainability, a structured approach will be adopted. Key sales and purchase data will be collected and analyzed with the use of tools like Excel, Python, and Power BI. By analyzing client wise sales data, reviewing inventory movement and studying trends in raw material prices over time will support in smarter decision making. The expected outcome is a set of practical recommendations that will help to improve financial stability, reduce risks, and improve overall business performance through informed decision-making.

2 Organization Background

This study follows Greenaway Enterprises LLP, Kanpur, Uttar Pradesh - based Micro Enterprise that was established on 7th August 2019 as a Limited Liability Partnership (LLP). The operate in the trading and distribution sector on a B2B (Business-to-Business) model, supplying raw materials based on plastic, chemicals and rubber.
It sources materials from both domestic suppliers - such as GAIL, SVN Bharat Minchem (Rajasthan), Kumar Minerals (Rajasthan), AG Chemicals (Kanpur) - and international suppliers, including imports from Vietnam. They supply materials like coated and uncoated calcium carbonate, toluene, methyl ethyl ketone, low-density polymers, china clay, polypropylene granules to small-scale manufacturers.

Greenaway uses Just-In-Time (JIT) delivery system. This approach means clients receive materials exactly when they need them, which helps small manufacturers who have limited storage capacity and tight budgets. By focusing on fast and flexible deliveries, the business helps its clients avoid high inventory costs while keeping their production processes running smoothly.

3 Problem Statement

These specific challenges form the main objectives for this proposal and will be researched further to find practical and data-driven solutions.

3.1 **High Dependency on a Few Clients:** The business currently relies heavily on a small number of clients for majority of its sales. This poses a risk - if even one major client reduces orders or stops buying, it could significantly impact their revenue.

3.2 **Rising Inventory Carrying Costs:** The firm holds more stock of chemicals and powders than needed some times. These materials cannot be stored for long period due to safety concerns. As a result, this leads to high storage and maintenance costs.

3.3 **Changing Raw Material Prices Affects Profit:** Frequent changes in raw material prices makes it difficult for the company to maintain stable profit margins. In a case where raw material prices increase, if the company cannot increase selling prices, then the result is a direct shrinkage of profit margin.

4 Background of the Problem

Greenaway Enterprise currently relies heavily on a small number of clients for most of its sales.

Because of this, a larger part of their income depends on just a few buyers. The company believes these clients will continue to place orders regularly, so they don't invest much in marketing or expanding their customer base. This over-reliance on a few clients will create a problem for them because if few clients decides to reduce their purchases or switch to another supplier, it can lead to a sudden drop in income.

To meet customer demand, the business often purchases raw materials in large quantities and keeps extra stock in the warehouse. While this method prevent delivery delays, it also

results in high storage and maintenance costs. Suppliers are located all over India and even abroad, with some deliveries taking up to 10 days to arrive. Over time, holding too much inventory costs money and reduces overall profits. This problem can become worse by inaccurate demand forecasting or bulk buying just to get discounts.

Another difficult experience the business faces is the frequent change in raw material prices. These prices are affected by market trends and global demand. The business often ends up purchasing materials at a higher rate and then selling materials at a lower rate due to price drops in the market. Due to this their profit margins shrink. The key factor identified contributing to this problem was lack of long-term pricing contracts.

5 Problem Solving Approach

1. Data Collection Process: After having a clear understanding of the problems the next step is to collect relevant data from the business, including sales and purchasing records. This data will help identify key issues such as client dependency, inventory costs, and price fluctuations impact on profit. The data will be collected over at least 6 months for performing in-depth analysis and finding patterns to detect trends.

2. Data Analysis Methods: Once the data has been collected, it will be analyzed to understand the primary problems in the business. Firstly, descriptive statistics will be used to understand the distribution of material rates, quantities, and sale values over time. To explore trends and fluctuations in raw material prices, time series analysis will be helpful. For identifying top clients contributing to revenue, Pareto analysis or the 80/20 rule can be applied. Correlation analysis will help to evaluate how raw material rates affect profit margins. If possible, regression analysis or forecasting models can be used to predict material costs and demand trends.

3. Problem-Specific Analysis: In the third step, each core problem identified will be analyzed separately to find any patterns. This will help to provide actionable and feasible solutions to the firm.

- By preparing Pareto analysis, we can identify the top 20% of clients contributing to 80% of the revenue. This will show over-dependence on a limited number of clients and help

the business develop strategies to increase their customer if they sell in different regions.

- Through time series and correlation analysis, we can track price trends and understand how change in raw material rates affect sales and profit margins. This information can help better purchase timing and inventory management, ultimately reducing carrying costs and improving profitability.

Tools Utilized and Final Recommendations: The appropriate tools will be utilized to enhance decision-making and recommendations. Excel or Python (Pandas, Matplotlib, Seaborn) will be used for data preprocessing, data analysis, visualization, and identifying trends. If needed, Business Intelligence (BI) tools such as Power BI will also be utilized to produce reports and visualizations, which can provide a better understanding of sales trends, client dependency, inventory status and the impacts of changes in raw material prices. Based on the results, final recommendations and actionable steps will be provided to the business like - such as diversifying the client base, predicting demand and steps to adjust inventory for each material sold and suggesting to create a pricing contract with a particular customer based on analysis.

6 Expected Timeline

6.1 Work Breakdown Structure:

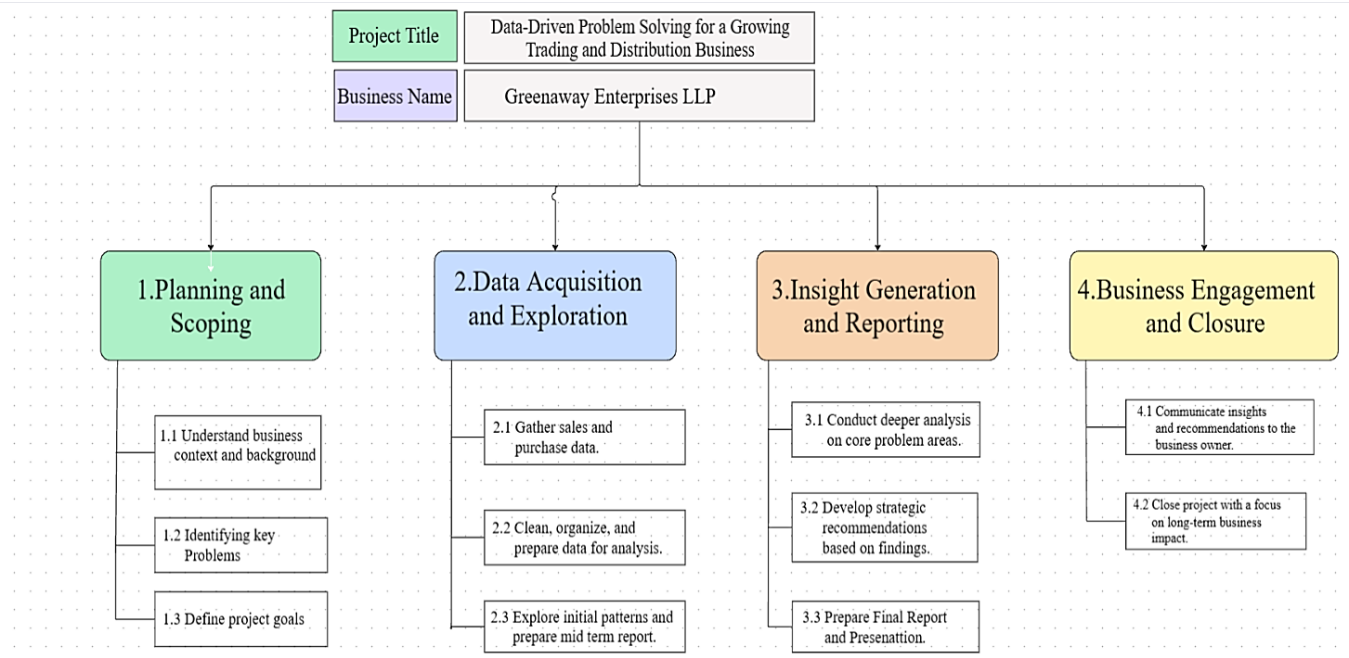
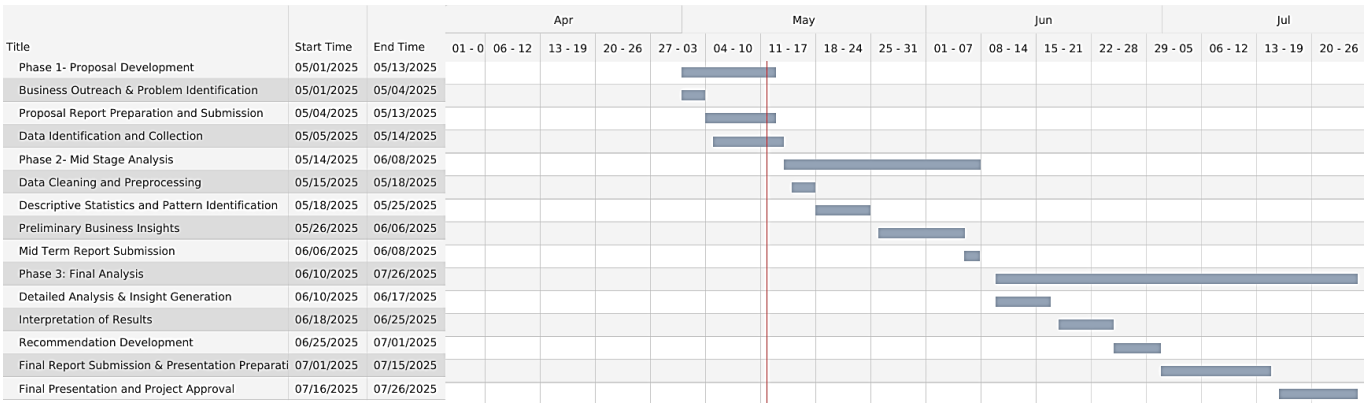


Fig 1. Work Breakdown Structure for BDM Project

6.2 Gantt chart



Title	Start Time	End Time
Phase 1- Proposal Development	05/01/2025	05/13/2025
Business Outreach & Problem Identification	05/01/2025	05/04/2025
Proposal Report Preparation and Submission	05/04/2025	05/13/2025
Data Identification and Collection	05/05/2025	05/14/2025
Phase 2- Mid Stage Analysis	05/14/2025	06/08/2025
Data Cleaning and Preprocessing	05/15/2025	05/18/2025
Descriptive Statistics and Pattern Identification	05/18/2025	05/25/2025
Preliminary Business Insights	05/26/2025	06/06/2025
Mid Term Report Submission	06/06/2025	06/08/2025
Phase 3: Final Analysis	06/10/2025	07/26/2025
Detailed Analysis & Insight Generation	06/10/2025	06/17/2025
Interpretation of Results	06/18/2025	06/25/2025
Recommendation Development	06/25/2025	07/01/2025
Final Report Submission & Presentation Preparati	07/01/2025	07/15/2025
Final Presentation and Project Approval	07/16/2025	07/26/2025

Fig 2. Expected Timeline for completion of project

7 Expected Outcome

7.1 Improved Client Diversification: By identifying top clients through Pareto analysis, the business will identify over-dependence on few of their buyers. This can help develop strategies to expand the client base and reduce risk.

7.2 Improved Inventory Management: The analysis will identify any slow moving inventory and high carrying costs. This will enable better planning and avoid unnecessary carrying costs.

7.3 Better Pricing and Margin Decisions: Time series analysis will highlight how raw material cost changes impact profits. The business can then revise their pricing or can communicate to their smaller number of customers that if they purchase a material at a high price, and it drops suddenly, hence their selling price may fluctuate a little. This will help the business to maintain their income and also their working capital to meet inventory carrying cost.

7.4 Data-Driven Sales Planning: Descriptive analysis of sales volume and sales rates will help spot sales patterns and seasonality. This enables more accurate sales planning and improved inventory management.