

Data-Driven Decision Making for Saeed Mega Mart: A Case Study of Employing Sales Forecasting, Customer Segmentation, and Sentiment Analysis Strategies

A Proposal report for the BDM Capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled “**Data-Driven Decision Making for Saeed Mega Mart: A Case Study of Employing Sales Forecasting, Customer Segmentation, and Sentiment Analysis Strategies**”.

I extend my appreciation to **Saeed Mega Mart** 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 analysed 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 fulfilment in the **BS Degree Program** offered by **IIT Madras**.

The institution does not endorse any of the claims or comments.

Signature of Candidate: **ANEEQA HAROON SIDDIQUI**

Name: Aneeqa Haroon Siddiqui

Date: 02/10/2023

1 Executive Summary

Saeed Mega Mart is a small family business that operates a small mart in **Sandila, Uttar Pradesh, India**. The business sells various products such as **bangles, cosmetics, handbags, jewellery, and gift items**. It also **rents out** some of its shops to other businesses.

The project aims to use data-driven methods to optimize the business performance of Saeed Mega Mart by addressing two problems: how to **improve the sales forecasting and analysis** using the daily sales data and external factors; and how to enhance the **customer segmentation and loyalty** using the customer data and feedback.

The project will use **MS Excel** and **Python** as the analysis tools. MS Excel will be used to perform the initial data cleaning and preparation. Python will be used to handle the text data from the customer review form and apply various data analysis and machine learning techniques.

The expected outcome of this project is to help Saeed Mega Mart improve its sales forecasting accuracy and efficiency; understand its customer segments better and tailor its products, services, prices, and promotions to suit their needs and expectations; and increase its customer loyalty and retention rates. This will ultimately lead to **increased market share** and **profitability** for Saeed Mega Mart.

2 Organization Background

Saeed Mega Mart is a small family business that operates a small mart in **Sandila**, a town and nagar palika parishad in Hardoi district in the Indian state of Uttar Pradesh. The business was established **6-7** years ago by **Mr. Mukeed**, who started with **bangle selling** as his main product. Over the years, he expanded his business to include other products such as **cosmetics, handbags, jewellery, and gift items**. He also rents out some of his shops to other businesses, including a **ladies parlour**. Saeed Mega Mart caters to the local customers who need various products and services for their daily needs and special occasions. The business is unorganized and does not use any computer or software to manage its data. The only record of daily sales data is a written diary that owner maintains. The sales data varies depending on the season, festivals, and weddings. Saeed Mega Mart faces challenges such as **pricing strategy, customer satisfaction, and market competition**. Owner's sons help him manage the store and handle different aspects of the business.

3 Problem Statements

The main objective of this project is to use data-driven methods to optimize **the business performance** of Saeed Mega Mart. The project aims to address the following specific problems:

- 3.1. How to improve the **sales forecasting and analysis** of Saeed Mega Mart using the daily sales data and external factors such as seasonality, festivals, and competition?
- 3.2. How to enhance the **customer segmentation and loyalty** of Saeed Mega Mart using the customer data and feedback?

4 Background of the Problem

The business performance of Saeed Mega Mart depends on its ability to forecast sales, segment customers, and manage competitive edge effectively. However, these tasks are challenging due to several internal and external factors.

Some of the internal factors are:

- **Lack of data collection and analysis tools:** The business does not use any computer or software to manage its data. The only record of daily sales data is a written diary that is not easily accessible or reliable.
- **Limited customer information and feedback:** The business does not have any customer data or feedback system. This makes it difficult to understand the customer preferences, behaviour, satisfaction, and loyalty.
- **Low customer loyalty and retention:** The business faces competition from other businesses that offer similar or better products and services. This reduces the customer loyalty and retention rates.

Some of the external factors are:

- **Seasonal and festive fluctuations in demand:** The sales data varies depending on the season, festivals, and weddings. This makes it hard to predict future sales and plan inventory accordingly.
- **Competitive pressure from other businesses:** The business has to compete with other businesses that offer similar or better products and services at lower prices or higher quality. This affects the market share and profitability of Saeed Mega Mart.
- **Changes in customer preferences and expectations:** The customer preferences and expectations change over time due to social, economic, cultural, and technological factors. This requires constant adaptation and innovation from Saeed Mega Mart.

5 Problem Solving Approach

The above factors create challenges and gaps for Saeed Mega Mart that need to be addressed by using data-driven methods to optimize its business performance.

The methods used for each problem statement are as follows:

- To improve the sales forecasting and analysis of Saeed Mega Mart using the daily sales data. This project will use descriptive statistics, time series analysis, regression analysis, and feature engineering techniques. These methods are suitable for because they can help to summarize, explore, and model the sales data over time and identify the trends, patterns, and seasonality.
- To enhance the customer segmentation and loyalty of Saeed Mega Mart using the customer data. This project will use clustering analysis, classification analysis, and sentiment analysis techniques. These methods are suitable for this problem because they can help to label and profile the segments based on their loyalty and satisfaction level as well as analyse reviews in terms of their sentiments or emotions.

The intended data collection for each problem statement are as follows:

- The main data source for this problem is the daily sales data that owner maintains in his written diary. This data is essential for forecasting and analysing the sales performance of Saeed Mega Mart. However, this data is not easily reliable as it is not stored in a digital format. Therefore, we will digitize the written diary into a spreadsheet format that can be imported into the data analysis tools for further processing.
- The main data source for this problem is the customer data that will be collected from a Google form that will be circulated via WhatsApp to the existing and potential customers of Saeed Mega Mart. The Google form will contain questions about the customer's personal details, purchase history, product preferences, satisfaction level, and.

The analysis tools that are used for this project are MS Excel and Python.

- MS Excel is used to perform the initial data cleaning and preparation using its features such as formatting, sorting, and correcting. MS Excel is also used to create graphs, pivot tables, and basic exploratory data analysis (EDA) to understand the data better.
- Python is used to handle the text data from the customer review form and apply various data analysis and machine learning techniques such as clustering analysis, classification analysis, and sentiment analysis. Python is also used to perform any advanced analysis that may be required.

6 Expected Timeline

WORK BREAKDOWN STRUCTURE WITH GANTT CHART

PROJECT TITLE	Data-Driven Decision Making for Saeed Mega Mart: A Case Study of Employing Sales Forecasting, Customer Segmentation, and Sentiment Analysis Strategies																	
PROJECT LEAD	Aneeqa Haroon Siddiqui																	
COMPANY NAME	Saeed Mega Mart																	
DATE	05/08/2023 TO 31/12/2023																	
WBS NUMBER	TASK TITLE	START DATE	DUE DATE	DURATION	% of TASK COMPLETE	PHASE ZERO	PHASE ONE				PHASE TWO				PHASE THREE			
						WEEK 0	1	2	3	4	5	6	7	8	9	10	11	12
0	Project Initiation																	
0.1	Identify and contact potential business owners for the project	05-08-2023	07-09-2023	33	100%													
0.2	Select and finalize the business owner and the project scope	07-09-2023	13-09-2023	6	100%													
1	Project Planning																	
1.1	Collect and organize data from various sources	15-09-2023	15-10-2023	30	55%													
1.2	Define the project objectives, deliverables, and timeline	19-09-2023	23-09-2023	4	100%													
1.3	Prepare and submit the project proposal	01-10-2023	05-10-2023	4	100%													
2	Project Execution																	
2.1	Perform data analysis using the chosen tools and techniques	15-10-2023	25-10-2023	10	0%													
2.2	Generate data visualization using charts, dashboards, and reports	26-10-2023	29-10-2023	3	0%													
2.3	Interpret and validate the results of data analysis and visualization	29-10-2023	05-11-2023	7	0%													
2.4	Prepare and submit the mid-term report	06-11-2023	10-11-2023	4	0%													
3	Project Closure																	
3.1	Finding problem's solution	11-11-2023	25-11-2023	14	0%													
3.2	Document the project findings, conclusions, and recommendations	26-11-2023	09-12-2023	13	0%													
3.3	Prepare and submit the final report	11-12-2023	15-12-2023	4	0%													
3.4	Present the project results in a viva voce	25-12-2023	31-12-2023	6	0%													

7 Expected Outcome

The expected outcomes of the project are:

- A **predictive model** that **can forecast the monthly sales** of Saeed Mega Mart for the next year and provide confidence intervals and error metrics.
- A **dashboard** that can **visualize the sales data** and the external factors using various charts and graphs and provide insights into the sales trends, patterns, seasonality, and performance.
- A **report** that can analyse the factors that affect the **sales performance** of Saeed Mega Mart and **provide recommendations** for improving the sales strategy.
- A **customer segmentation model** that can group the customers of Saeed Mega Mart into four segments based on their demographics, preferences, and behaviour and provide labels and profiles for each segment.
- A **dashboard** that can visualize the customer data and feedback using various charts and graphs and provide insights into the customer loyalty, satisfaction, and sentiments.
- A **report** that can analyse the customer segments and their associations with the products and services offered by Saeed Mega Mart and provide recommendations for enhancing customer loyalty and satisfaction.