Optimizing sales and services of a leading Lab equipment firm
A Proposal Report for the BDM Capstone Project

Submitted by

Name: **V SANJANA**

Roll number: **23f2000029**

IITM Online BS Degree Program,

Indian Institute of Technology, Madras, Chennai

Tamil Nadu, India, 600036

Contents

Declaration Statement

I am working on a Project titled "**Optimizing sales and services of a leading Lab equipment firm".** I extend my appreciation to **"SIGMA SCIENTIFIC PRODUCTS"** 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.

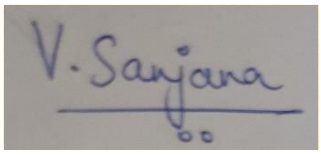
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

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:



Name: **V SANJANA**

Date: **12/07/2025**

1 Executive Summary

Sigma Scientific Products, established in 2015, is a Chennai based partnership firm specializing in manufacturing and selling scientific laboratory equipment to engineering colleges and schools for their laboratory needs. The company has 50+ products in their portfolio such as incubators, shakers, meters, mantles, furnaces etc. Many products are manufactured in-house and others are purchased and sold as white labelled products.

The company faces two major challenges: lack of insights on the product portfolio which is hindering them to rationalize, prioritize and market them effectively; lack of comprehensive understanding of the customer and corresponding sales which leads to ineffective marketing and sales effort.

To address the above challenges, an approach of utilizing product portfolio, sales forecasting and customer segmentation strategy is proposed. This will involve analysis of extensive product portfolio data, customer data and historical sales data. The analysis will be conducted using excel and python leveraging tools such as pivot tables and python statistical libraries.

The expected outcome is to rationalize the product portfolio and enhance targeted marketing effort which will ultimately increase companies' sales and market presence.

2 Organization Background

Established in 2015, "Sigma Scientific Products", is one of the prominent names engaged in manufacturing and trading a wide range of Laboratory Instruments. Manufactured using superior quality raw material like stainless steel, glass and rubber, these instruments are known for their immaculate quality and efficient performance. Designed in compliance with the prevailing industry standards, these instruments widely cater the needs of chemical industry, health care foundations and educational institutes. Sigma's clients include major education institutions like IIT Madras, VIT, AM Jain college etc. Other than educational institutions Sigma's clients include other industry leaders like Tamil Nadu Pollution control board, Bharath Rubber India Limited etc. The company was started with an initial investment of less than ten lakh rupees in 2015 and now in 2025, the turnover is more than 1.5 crores. The price range of the products varies based on the type. For example, the Bunsen burners are sold as low as Rs.3,500/-, High temperature ovens at Rs.38,000/- and products such as Tray dryer machines are priced at Rs.1,25,000/-. The company is running with 3 to 5 full time employees and around 10 part time employees who are called on a need basis.

Name: Sigma scientific products
CEO: R. Rajagopal
Address: Registered as partnership firm in Sri Ram Nivas, No- 15, Hindu Colony, 9th Cross Street, Nanganallur, Chennai- 600061, Tamil Nadu, India
GST #:33ACTFS3047A1Z9
Website: https://www.sigmainstruments.org/

3 Problem Statements

Based on the discussion and analysis of Sigma scientific products' situation, the below problem statements are identified.

1. **Product rationalization:** As the portfolio of products has grown substantially (more than 50 major products and 150+ variations), the firm is struggling to rationalize, strategize and market those products effectively.
2. **Customer & sales intelligence:** Lack of comprehensive customer understanding and the corresponding products being sold across different time horizons results in ineffective marketing, customized offerings and potentially missing sales across market segments.

4 Background of the Problem

Sigma scientific products, established in 1997, has been growing steadily over years due to quality products, consistent sales and good quality post sales service. Over the past few years, Sigma is facing challenges due to new entrants. Sigma's primary objective is to increase profitability, but struggles with various challenges which are both internal and external.

Internally, the company is dependent on skilled manpower having unique sales and service expertise. Many employees are not needed full-time due to lack of work and part-time workers lack commitment to quality sales & service. This hinders growth as the firm cannot accept more orders during peak demand situations. The numbers of products have significantly grown over a period of time and there is a need to re-look at the product portfolio as some of the products are in the inventory without sales which can be decommissioned. The firm can really focus on high sales and high margin products and align the employees accordingly.

Externally, the company is facing challenges from competition who are trying to grab the market share by providing better quality sales and service at a reduced price. Lack of strong customer and sales intelligence affects implementing effective marketing strategies.

5 Problem Solving Approach

In order to address the above challenges faced by Sigma, a comprehensive approach focusing on rationalizing product portfolio and enhancing customer and sales intelligence is proposed. This approach will help in managing products effectively and developing targeted marketing driving growth. The below detailed plan outlines the methods, data collection and the analysis tools for each problem statement.

1 - As the portfolio of products has grown substantially the firm is struggling to rationalize, strategize and market those products effectively.

1.1 Methods Used with Justification

1.1.1 Data cleaning and organisation

During our initial analysis, we found that the data needs to be cleansed for better analysis. Product pricing varies by customer and is not a standard price as listed on the website. Purchase and sales data lack unique

product and customer identifiers, such as customer type and location. A data correction exercise is needed to remove inconsistencies, duplicates, and errors. Unique IDs for customers and products will be added to ensure accuracy and completeness.

1.1.2 Product Portfolio Analysis and Rationalization

Product portfolio analysis - Understanding how products are categories by type like ovens, dryers etc. Help the company to gauge the diversity of the product offering and identify redundant products which need to be merged or discontinued.

1.1.3 Comparative Pricing and Sales Intelligence

Product pricing analysis - Identify the right set of high value and high margin products. Look at the low-value fast movers for repeat sales.

1.2 Intended Data Collection

Effective data collection is the first important step. Three major data set will be used for generating insights,

1. **Product data set** - This will include details of the products being sold, model, category, purchase price, sale price, margin, manufacturer, model, HSN code, availability, warranty etc.
2. **Sales data set** - date of sale, customer name, selling price, product name and model

The company provided access to the product repository and sales data sets for the last 2 years starting April 2023 to March 2025 for analysis.

1.3 Analysis Tools Used with Justification

Excel:

- **Pivot tables** for data aggregation and initiation rationalization
- **Data visualization tools** like scatter plots and bar charts
- **Basic clustering** using excel formulas and conditional formatting

Justification: Excel is used for initial data exploration providing a quick snapshot view of products.

Python libraries:

- **Matplotlib & Seaborn:** to create statistical graphics for product visualization and segmentation.
- **Scikit-learn:** to create product clustering, forecasting and segmentation

Justification: Python libraries offer more sophisticated clustering algorithms and visualization techniques for product segmentation.

2 Lack of comprehensive customer understanding and the corresponding products being sold across different time horizons results in ineffective marketing, customized offerings and potentially missing sales across market segments.

2.1 Methods Used with Justification

2.1.1 Customer Segmentation by Sales Volume and Transactions

Top customers by sales volumes, both in terms of number of transactions and quantity sold, will be identified. This segmentation enables the company to recognize high-value customers, build stronger relationships, and create opportunities for up-selling and bundled product offerings.

2.1.2 Time Series Analysis for Sales Forecasting

Monthly sales trends will be plotted to identify low and peak sales cycles. This time series analysis will assist in efficient inventory planning, staffing, and forecasting future sales patterns, leading to better resource management.

2.1.3 Geographical and Sectoral Sales Distribution

A heat map representation of sales data across geographical locations and industry segments will be created. This will highlight high-performing regions and sectors, helping align marketing efforts and expansion strategies more effectively.

2.2 Intended Data Collection

Effective data collection is the first important step. Three major datasets will be used to generate insights:

1. **Product Data Set** – Details such as model, category, price, margin, HSN code, warranty, etc.
2. **Sales Data Set** – Includes sale date, customer name, selling price, product model, etc.

The company has provided access to the product and sales datasets from April 2023 to March 2025.

2.3 Analysis Tools Used with Justification

Excel:

- **Pivot tables** for data aggregation and initiation segmentation
- **Data visualization tools** like scatter plots and bar charts
- **Basic clustering** using excel formulas and conditional formatting

Justification: Excel is used for initial data exploration and simple segmentation tasks, providing a quick snapshot view of customer segments.

Python libraries:

- **Matplotlib & Seaborn:** to create statistical graphics for customer demographics, behaviour, and trends.
- **Stats models:** Time series analysis for sales trend forecasting

Justification: Python libraries offer more sophisticated clustering algorithms and visualization techniques for customer segmentation.

6 Expected Timeline

6.1 Gantt chart

Project Timelines			Jul-25					Aug-25				Sep-25
Activity	**Start**	**End**	W1	W2	W3	W4	W5	W1	W2	W3	W4	W1
Proposal completion	30-Jun	12-Jul										
Collect relevant data	12-Jul	13-Jul										
Data cleansing	14-Jul	18-Jul										
Data analysis	18-Jul	25-Jul										
Preparing charts and graphs for data visualization	25-Jul	30-Jul										
Mid-term preparation	01-Aug	03-Aug										
Icorporating feedback	06-Aug	09-Aug										
Advanced Data Analysis and refining final solutions	10-Aug	20-Aug										
Final report preparation and submission	21-Aug	25-Aug										
Creating slides and viva voce	26-Aug	02-Sep										

Figure 1: Gantt Chart for the project timeline

6.2 Work Breakdown Structure

Stage	Activity
Proposal submission	•Identify the company •Understand their problems •Finalizing the problem statement •Figuring out possible solution •Creating a proposal document
Mid-term submission	•Collecting the necessary data •Cleansing the data •Basic analysis of data using graphs/excel •Creating a mid-term document
End term submission	•Detailed data analysis, visualization & insights •Playback of findings with the company •Incorporate feedback •Create final submission

Figure 2: Work breakdown structure for the project

7 Expected Outcome

Product rationalization

- Ability to maintain the right set of product portfolio helping in higher sales
- Better management of product inventory thereby reducing cost and increasing sales.
- Effective pricing strategy & prioritization of sales resources for high margin products

Customer segmentation

- Better understanding of the customer preferences and behaviours in the lab equipment market
- Ability to tailor marketing efforts to specific customer segments
- Better allocation of marketing resources to high potential customers thereby increasing market share.