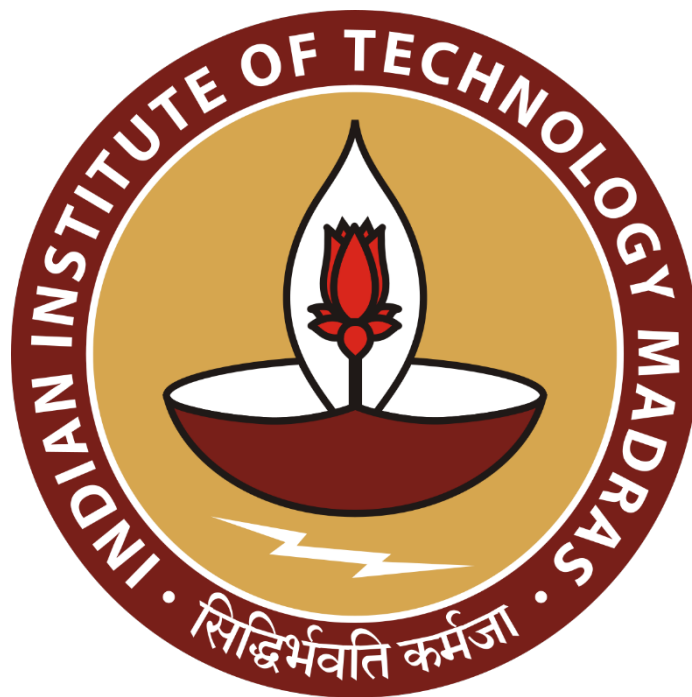**Title: Optimizing Profitability and Stock Management for Amway Business Owner**

A Final report for the BDM capstone Project

Submitted by

Name: Govind Soni

Roll number: 21F1002864

IITM BS Degree Program,

Indian Institute of Technology, Madras, Chennai

Tamil Nadu, India, 600036

Contents

1. Executive Summary and Title

Title: "Optimizing Profitability and Stock Management for Amway Business Owner"

Executive Summary:

This comprehensive report delves into the meticulous analysis conducted on the sales and inventory data of ABO Sarita Soni's Amway venture throughout the year 2022. The data collected from bills and records was meticulously transcribed into structured Excel workbooks, enabling a detailed examination of sales, stock, and product information.

Key findings emerged from various analytical methods employed:

a) Pareto Analysis:
   - Identified distinct customer segments like 'Premium Customer Segment,' 'Promising Growth Segment,' and 'Underperforming Client Category.'
   - Revealed discrepancies between high-volume and high-revenue products, urging focused attention on top contributors to revenue generation.
b) Customer Segmentation:
   - Highlighted premium and aspiring customer segments for targeted engagement and retention strategies.
   - Identified low-revenue customer segments that may warrant strategic neglect to optimize resources.
c) Affordability Perception Analysis:
   - Conducted market price comparisons to dispel the perception of costly products.
   - Advocated for product demonstrations to underscore the durability and value of offerings.
d) Inventory Management Analysis:
   - Demonstrated successful management strategies that averted stockouts.
   - Identified products with high average sales and those occupying excessive inventory space.

Recommendations derived from these insights are focused on optimizing operations, leveraging automation tools for error reduction, integrating analytics for informed decision-making, and implementing targeted strategies for customer segments.

The report underscores the challenges and complexities inherent in contemporary business operations, emphasizing the need for robust analytical approaches to navigate multifaceted constraints. It concludes by emphasizing the importance of analytics in crafting feasible solutions.

2. Detailed Explanation of Analysis Process

- The data utilized for analysis was sourced directly from the Business Owner's records covering the entirety of 2022, specifically from January through December. These

records, primarily consisting of bills, are meticulously maintained by the Business Owner for potential product returns to the manufacturer in case any issues are identified by either her or her customer base.

- The data, crucial for our analysis, was manually transcribed from these bills into an Excel workbook. This detailed dataset, saved in .xlsx format, is structured into two main tables: the Sales data (Table 1) and the Stock data (Table 2).
- The Sales data encompasses 492 rows, containing comprehensive information such as Date of purchase, Order_ID, Customer ID (confidentially labeled as C001, C002, etc.), Product Name, SKU (Stock Keeping Unit), Quantity purchased, Unit Price (MRP), Total Transaction Amount, Week, Month, Day of the week, and the Payment Type.
- On the other hand, the Stock data consists of 840 rows and includes details such as SKU, Month, Opening Stocks, Sales, Inward Stocks, and Closing Stocks. This data provides insights into the stock inventory, tracking the quantities available, sold, purchased, and remaining, aiding in efficient inventory management and supply chain optimization.

Components	Description
Date	The date of purchasing of products.
Order_ID	The ID number of the order placed.
Customer ID	The ID of the customer who purchased the product. For confidentiality we use Terms like C001, C002,…etc.
Product Name	The Name of the product being sold including the size of the product.
SKU	The SKU (Stock Keeping Unit) is the Product ID by which each product uniquely identified.
Quantity	The number of units of the product being sold.
MRP	The price per unit of the product being offered.
Total Amount	The overall monetary value of the transaction, calculated by multiplying the rate and quantity.The individual or entity purchasing the product or service in the transaction.
Week	The number of week in which the purchase occurs i.e. between 1-52.
Month	The Month in which the purchase occurs i.e. from January – December.
Day	The Day on which the purchase occurs i.e. from Monday – Sunday.
Payment Type	The chosen mode of payment for the transaction, such as cash or UPI methods (Unified Payment Interface) like PhonePe, Paytm etc.

Table 1 : Sales Data

The Stock data size is 840 rows it contains SKU, Month, Opening Stocks, Sales, Inward Stock and Closing Stock. We have 70 different types of products.

Components	Description
SKU	The unique id of the products which ranges from P001 – P070.

Month	Months ranging from January – December.
Opening Stocks	The initial quantity of products available in the inventory at the beginning of the month.
Inward Stocks	The quantity of products received or purchased in that specific month, contributing to the overall inventory.
Sales	The total quantity of products sold from the inventory in that month.
Closing stocks	The remaining quantity of products in the inventory at the end of that specific month, after accounting for sales and inward stock.

Table 2 : Stocks Data

There is another Table 3 i.e. Product Info which has the information about SKU, Product Name, MRP, Category and PV. Its Size is 70 as we have 70 unique products across different categories.

Components	Description
SKU	The unique id of the products which ranges from P001 – P070.
Product Name	The Name of the product being sold including the size of the product.
Category	The term denoting the category to which the product belongs.
MRP	The price per unit of the product being offered.
PV (Point Value)	The Point value represents the metric by which the value of a product is gauged within the Amway business model. It serves as a pivotal factor that determines the incentives received by the Business Owner.

Table 3 : Product Info

Some Instances of Products

SKU	Product Name	MRP
P002	Glister™ Multi Action Toothpaste	291
P006	Persona Talc 350g	269
P007	Persona 100% Pure Coconut Oil	265
P008	NUTRILITE® Salmon Omega-3 Softgels	1606
P015	NUTRILITE® All Plant Protein Powder	4306

Table 4 : Products

Some Instances of Customers

Customer ID	Total Amount in Rs
C001	34866
C002	32238
C003	25856
C006	19162
C016	19008

Table 5 : Customer

The products fall into a total of five distinct categories listed below:

a) Personal Care
b) Nutrition
c) Home Care
d) Artistry
e) Attitude

Data Usage and Purpose: The data which is collected will be utilized to gain customer insights, identify sales patterns, and improve customer relations, while the inventory data will be used for optimizing stock levels and managing supplies efficiently.

3. Descriptive Statistics

I. Revenue wise

- The total sales for the year 2022 from 1st January – 31st December amounted to **Rs 7,19,662.**
- The estimated count of transactions stands at around **240**. The actual count might be higher, considering that the received data had missing values, leading to the omission of certain rows.
- Gross profit was **1,43,932.4** and Net profit was **1,07,949.3** for the year **2022.**
- The highest sales occurred during **Week 41**, amounting to **Rs 58,943.00** , closely followed by **Week 20** at **Rs 58,805.00**.
- **May 2022** saw the highest sales in a month, totaling **Rs 1,12,690.00**, while **October 2022** recorded sales of **Rs 92,654.00**.
- Preferred payment methods show **Cash** leading with **Rs 4,67,897.00**, trailed by PhonePe with **Rs 1,56,530.00**.
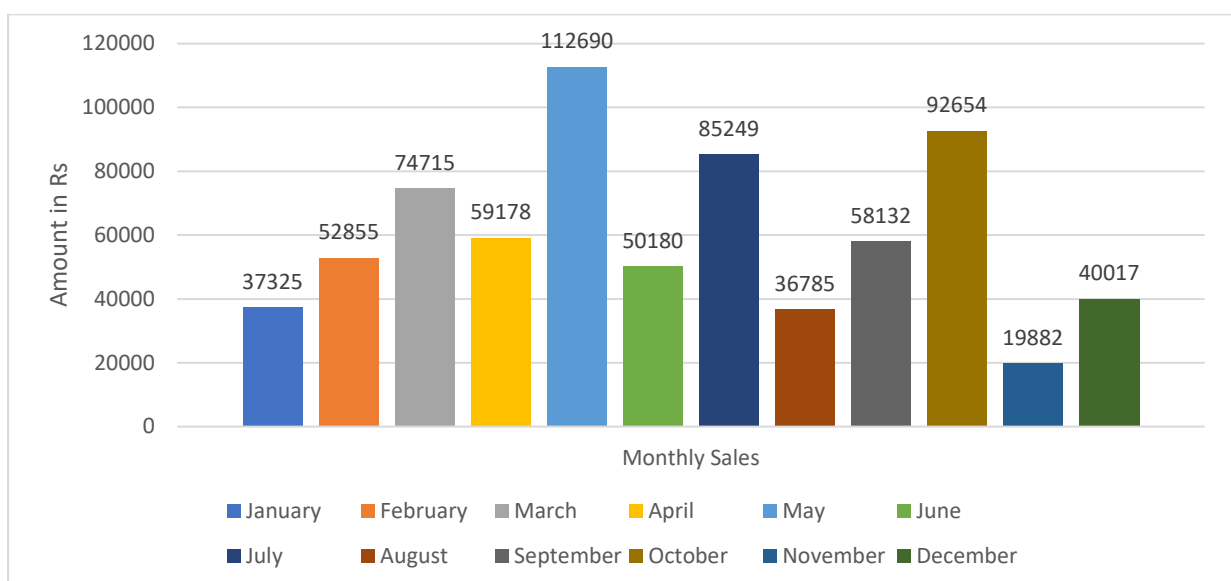- The below Figure 4 shows monthly sales in Rs.

Figure 1 : Monthly Sales

II. Inventory wise

- The customer with Customer_id **C001** is the customer with the highest purchase value equivalent to a total of **Rs 34,866.00** and purchased **22** items.
- Notably, **P059** boasts the highest Average Opening Stock of **22.42**, accompanied by an average sales figure of **0.25** in terms of items which is very poor.
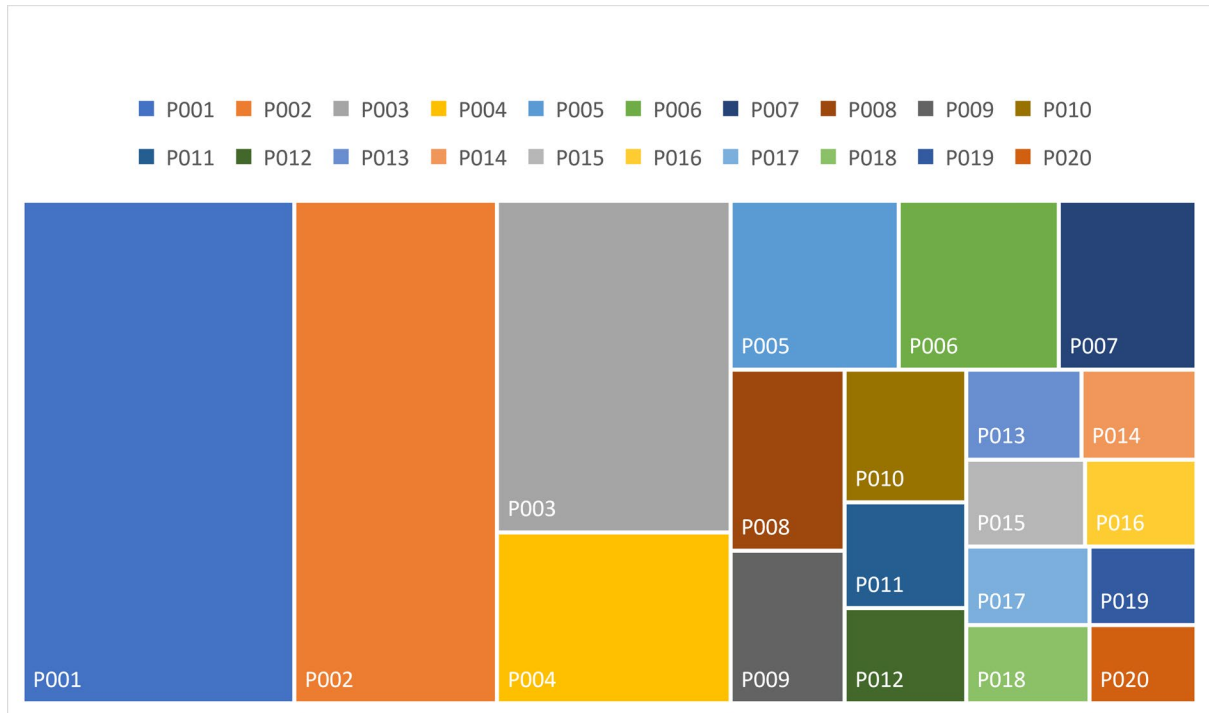- The below is the tree map of top 20 highest selling products in Figure 5.

Figure 2 : Tree map of Top 20 highest selling Products

4. Results and Findings

I. Pareto Analysis for Revenue and Sales Volume

- Pareto Analysis or the 80/20 rule enables us to see if 20 percent of products are bringing 80 percent of Sales or not.
- The SKU is made for our ease after sorting the Products according to their Quantity Sold.
- We are going to do two different types of pareto analysis on Products with respect to volume and with respect to revenue.
    - a) Pareto analysis of Products with respect to Volume:
- The below Table 6 is the data which we used for the pareto analysis of Products with respect to Volume.
- Null Hypothesis (H0): Our analysis follows Volume Pareto (H0: μVP).
- Alternate Hypothesis (H1): Our analysis does not follow Volume Pareto (H1: ¬μVP).

SKU	Sum of Quantity	Total	Percentage Change

6

P001	212	212	17.6%
P002	158	370	30.7%
P003	120	490	40.6%
P004	62	552	45.8%
P005	44	596	49.4%
P006	42	638	52.9%
P007	36	674	55.9%
P008	32	706	58.5%
P009	27	733	60.8%
P010	25	758	62.9%
P011	20	778	64.5%
P012	18	796	66.0%
P013	16	812	67.3%
P014	16	828	68.7%
P015	16	844	70.0%
P016	15	859	71.2%
P017	15	874	72.5%
P018	15	889	73.7%
P019	13	902	74.8%
P020	13	915	75.9%
P021	12	927	76.9%
P022	12	939	77.9%
P023	11	950	78.8%
P024	11	961	79.7%
P025	11	972	80.6%
P026	10	982	81.4%
P027	10	992	82.3%
P028	10	1002	83.1%
P029	8	1010	83.7%
P030	7	1017	84.3%
P031	7	1024	84.9%
P032	7	1031	85.5%
P033	7	1038	86.1%
P034	7	1045	86.7%
P035	7	1052	87.2%
P036	6	1058	87.7%
P037	6	1064	88.2%
P038	6	1070	88.7%
P039	6	1076	89.2%
P040	5	1081	89.6%
P041	5	1086	90.0%
P042	5	1091	90.5%
P043	5	1096	90.9%
P044	5	1101	91.3%
P045	4	1105	91.6%

P046	4	1109	92.0%
P047	4	1113	92.3%
P048	4	1117	92.6%
P049	4	1121	93.0%
P050	4	1125	93.3%
P051	4	1129	93.6%
P052	4	1133	93.9%
P053	4	1137	94.3%
P054	4	1141	94.6%
P055	3	1144	94.9%
P056	3	1147	95.1%
P057	3	1150	95.4%
P058	3	1153	95.6%
P059	3	1156	95.9%
P060	3	1159	96.1%
P061	3	1162	96.4%
P062	3	1165	96.6%
P063	3	1168	96.8%
P064	2	1170	97.0%
P065	6	1176	97.5%
P066	5	1181	97.9%
P067	3	1184	98.2%
P068	11	1195	99.1%
P069	6	1201	99.6%
P070	5	1206	100.0%

Table 6 : Volume Pareto Analysis

- I have total 70 Products and I sorted them in Descending Order on the basis of Volume.
- According to 80/20 rule the 20% of the 70 products will be top 14 products.
- As we can see the Percentage Change till top 14 products is 68.7% which is less than 80%, hence I reject this null hypothesis.
- For a visual representation, please refer to Figure 6, which showcases the Volume Pareto analysis.
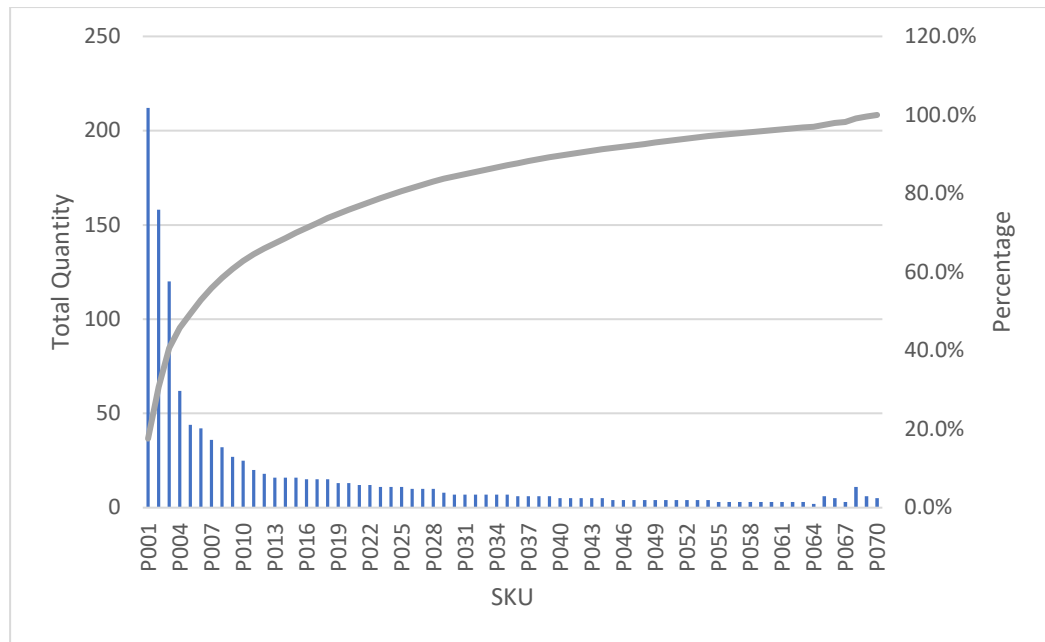
Figure 3 : Volume Pareto Analysis

b) Pareto analysis of Products with repect to Revenue:

- The below Table 7 is the data which we used for the pareto analysis of Products with respect to Revenue.
- Null Hypothesis (H0): Our analysis follows Revenue Pareto (H0: μVP).
- Alternate Hypothesis (H1): Our analysis does not follow Revenue Pareto (H1: ¬μVP).

SKU	Sum of Total Amount	Total	Percentage Change
P015	81814	81814	11.4%
P009	66528	148342	20.6%
P008	51392	199734	27.8%
P002	45978	245712	34.1%
P065	29990	275702	38.3%
P011	29190	304892	42.4%
P034	27344	332236	46.2%
P010	24500	356736	49.6%
P046	23316	380052	52.8%
P041	18893	398945	55.4%
P023	18660	417605	58.0%
P052	16645	434250	60.3%
P012	15426	449676	62.5%
P056	14475	464151	64.5%
P067	14334	478485	66.5%
P024	13332	491817	68.3%
P020	12740	504557	70.1%
P027	12540	517097	71.9%
P043	12306	529403	73.6%
P021	12168	541571	75.3%

P006	11298	552869	76.8%
P007	8460	561329	78.0%
P050	8035	569364	79.1%
P053	7572	576936	80.2%
P005	7568	584504	81.2%
P017	7320	591824	82.2%
P018	7320	599144	83.3%
P026	6970	606114	84.2%
P035	6748	612862	85.2%
P037	6570	619432	86.1%
P069	6297	625729	86.9%
P025	5610	631339	87.7%
P063	5148	636487	88.4%
P028	5100	641587	89.2%
P033	4879	646466	89.8%
P044	4820	651286	90.5%
P042	4415	655701	91.1%
P036	4188	659889	91.7%
P019	3900	663789	92.2%
P029	3600	667389	92.7%
P040	3570	670959	93.2%
P039	3060	674019	93.7%
P051	2788	676807	94.0%
P049	2700	679507	94.4%
P032	2555	682062	94.8%
P030	2496	684558	95.1%
P031	2443	687001	95.5%
P048	2440	689441	95.8%
P045	2188	691629	96.1%
P022	2052	693681	96.4%
P014	2000	695681	96.7%
P054	1988	697669	96.9%
P013	1760	699429	97.2%
P047	1745	701174	97.4%
P058	1680	702854	97.7%
P059	1680	704534	97.9%
P068	1658	706192	98.1%
P057	1647	707839	98.4%
P038	1644	709483	98.6%
P062	1530	711013	98.8%
P001	1484	712497	99.0%
P070	1183	713680	99.2%
P055	948	714628	99.3%
P066	945	715573	99.4%
P016	900	716473	99.6%

	840	717313	99.7%
P003	840	717313	99.7%
P061	750	718063	99.8%
P064	598	718661	99.9%
P060	567	719228	99.9%
P004	434	719662	100.0%

Table 7 : Revenue Pareto Analysis

- I have total 70 Products and I sorted them in Descending Order on the basis of Total Amount.
- According to 80/20 rule the 20% of the 70 products will be top 14 products.
- As we can see the Percentage Change till top 14 products is 64.5% which is less than 80%, hence I reject this null hypothesis.
- For a visual representation, please refer to Figure 7, which showcases the Revenue Pareto analysis.
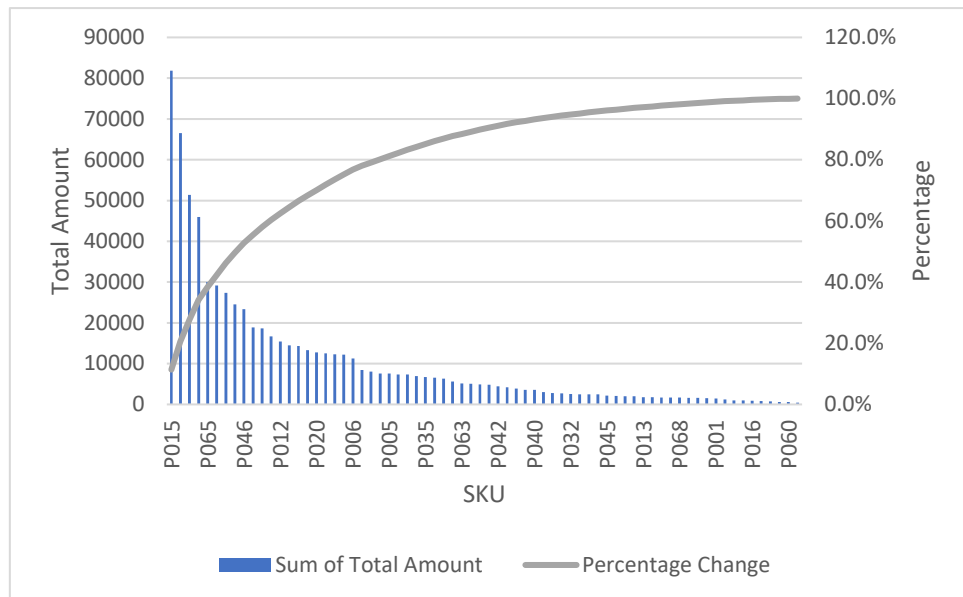
Figure 4 : Revenue Pareto Analysis

- **Inferences from Pareto Analysis:**
  - ➢ The products which has high volume according to volume pareto analysis is P001 followed by P002.
  - ➢ The products which generates high revenue according to revenue pareto analysis is P015 followed by P009.
  - ➢ There are certain products which has high volume but did not generate good revenue is P001 which suggests that this product is lower end product and consumes a lot of inventory space.
  - ➢ From the above two types of pareto analysis we can see that both volume and revenue pareto is not following which suggests that Ms. Sarita Soni has to work on their top 20% customers to generate most revenue by giving more incentives.

II. **Customer Segmentation**

- C001 is the largest buyer from ABO Sarita Soni in terms of revenue with around 22 items purchased which amounts to Rs 34,866.
- C067 and C074 is the most frequently visiting customers which is suggested by the volume purchased by them is close to 31 items. This is depicted by the Figure 5.
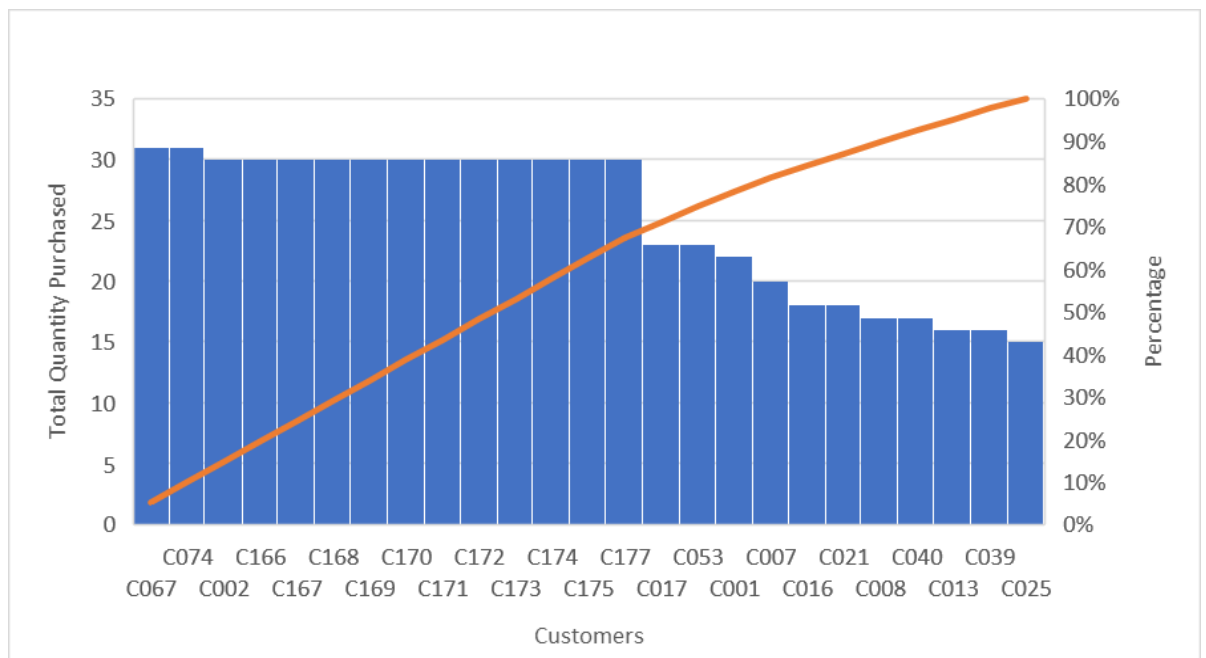

Figure 5 : Histogram of Customers according to the Quantity Purchased

- C002, a customer closely follows C001 in terms of revenue generation with around 30 items which amounts to Rs 32238. This is also depicted by the Tree map given in Figure 6.
- The analysis reveals that customers C001, C002, C003, C006 and C016 are the ones whose purchase is close to 20,000 Rs or more. These customers can be termed as "Premium Customer Segment".
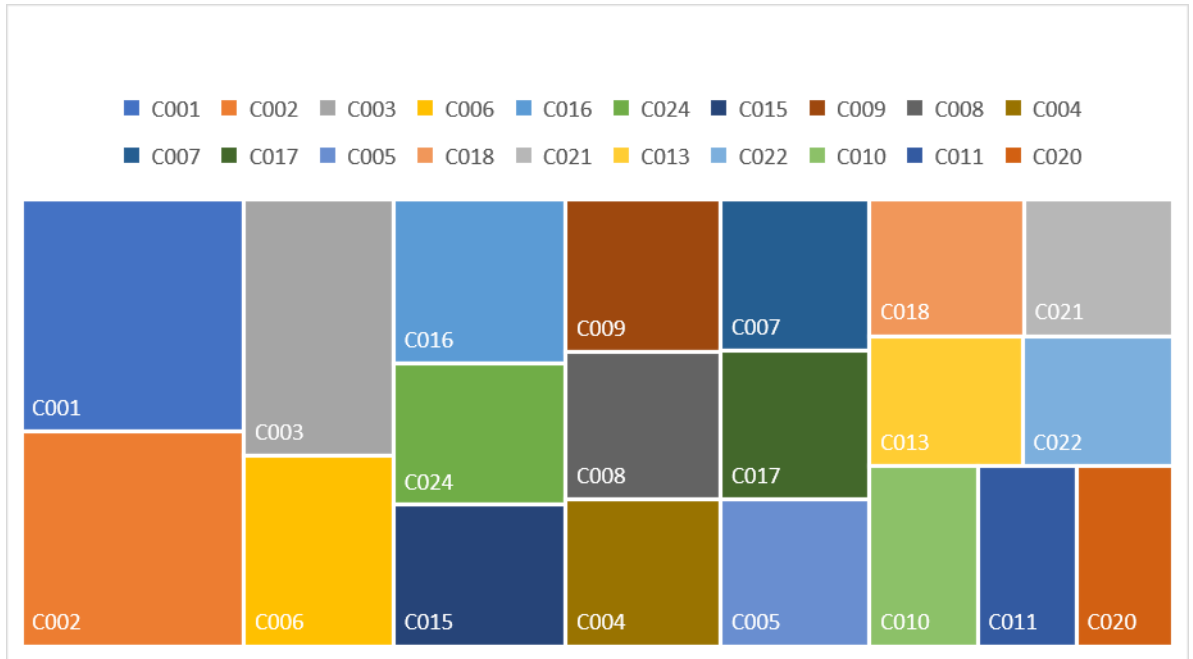
Figure 6 : Tree Map of Customers based on Revenue

- C225, C226, C227, C228, C229 and C239 are some of the customers which are generating less revenues and also have low volume purchase.
- The Customers C016, C024, C015, C009, C008, C004 and C007 are the aspiring customers, hence the ABO should focus on these customers and give them better offers to improve the revenue generated by them.

III.   Affordability Perception Analysis

- I selected some of my products and done a competitor market price analysis on them.
- The selected products are given in below Table 8 which has the products name, their quantity which I used as benchmark for the analysis purpose, the SKU, our product price and the Average Market Price.

SKU	Product Name	Quantity	Own Price	Average Market Price
P017	G&H Nourish+ Body Lotion- 250ml	250 ml	488	800
P013	Persona Amla Hair Oil	200 ml	110	84
P002	Glister™ Multi Action Toothpaste	190 gm	291	475
P006	Persona Talc 350g	350 gm	269	300
P007	Persona 100% Pure Coconut Oil	500 ml	235	310
P019	Glister™ Advanced Family toothbrush	pack of 3	300	316
P018	G&H Refresh+ Body Wash - Gel	250 ml	488	525
P012	NUTRILITE® Cal Mag D Plus	90 tab	857	1799
P037	NUTRILITE® Fiber	200 gm	1095	2146
P015	NUTRILITE® All Plant Protein Powder	1 kg	4306	4995
P005	Persona Cream Moisturizing Soap	75 gm	172	200
P031	attitude™ Be Bright Face Wash	100 ml	349	349

Table 8 : Market Price Analysis

- Below is the given clustered graph which shows the comparison between our price and the market price in figure 7.
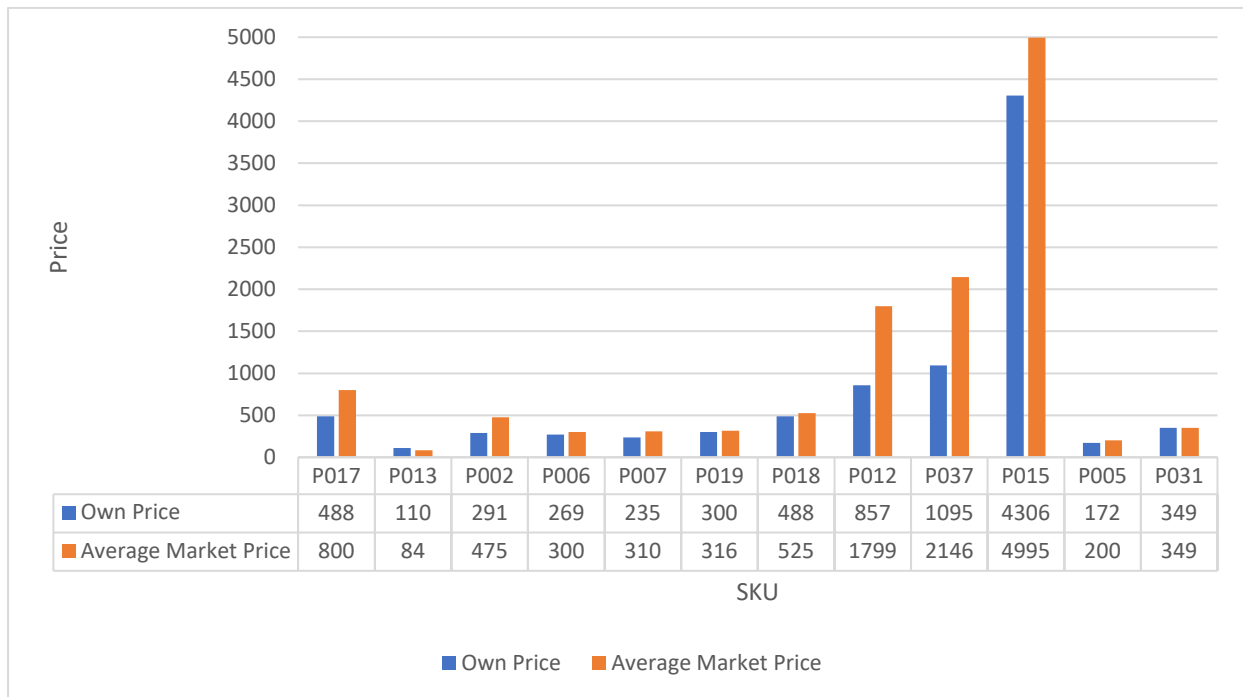

Figure 7 : Clustered Chart showing comparison between Own price and Average Market Price

- The above analysis told us that the price of Amway Products are not that costly as compared to their Competitors pricing.
- Which suggests that Ms. Soni should focus on better marketing of the products.

IV. Stock Management Analysis

- Throughout the year 2022 from January to December, ABO Sarita Soni has successfully averted any instances of stockouts. It's intriguing to observe that in the initial quarter of this year, the ABO sustains an inventory of over 50 items for all SKUs, despite varied demands for each product during that specific period.
- November recorded the lowest sales, while May observed the highest sales, surpassing 250 items sold in that month.
- February, October, and December marked sales figures nearing 100 items each.
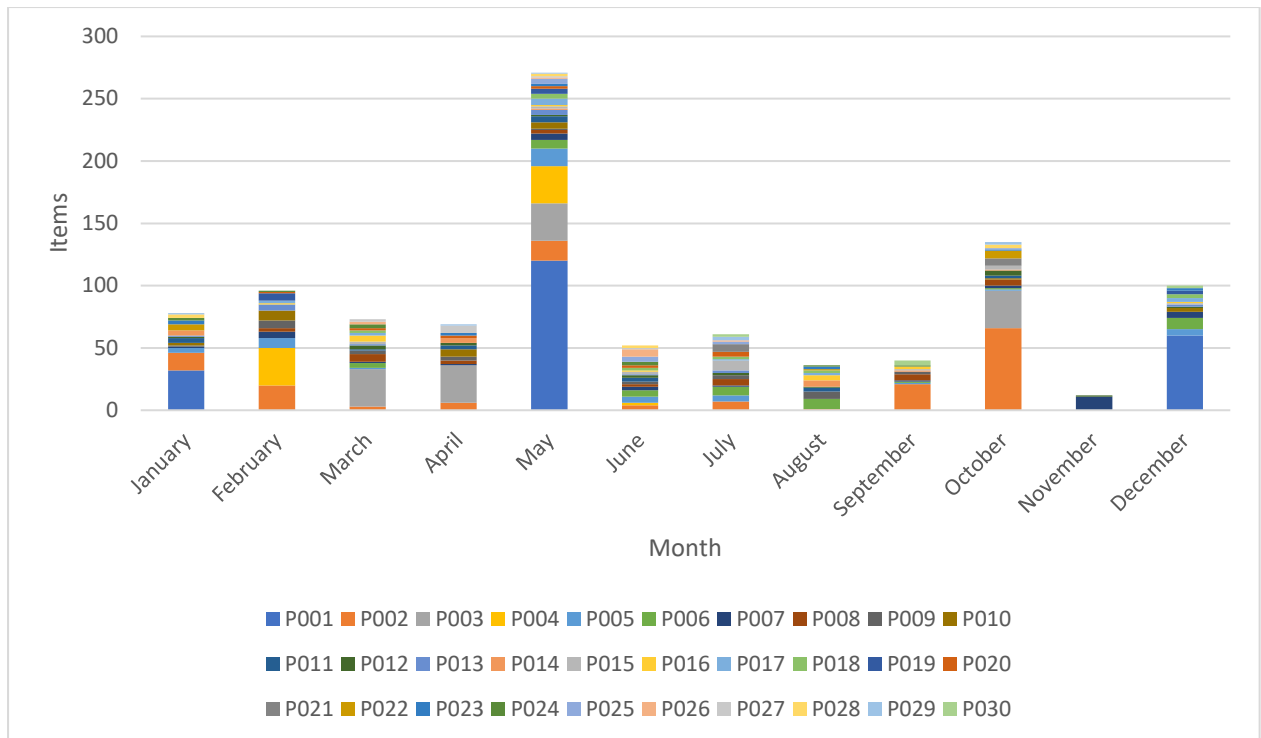- Figure 8 is showing the Monthly Sales Volume of the Items sold for various different products.

Figure 8 : Monthly Sales Volume of various products

- Among the customer base, C001 emerged as the high-value customer, contributing significantly to the business with a purchase value of Rs 34,866, involving the acquisition of 22 items across various transactions.
- In-depth scrutiny of inventory unveiled an interesting finding. Product P059 displayed a notable trend: while it boasted the highest average opening stock, its sales figures remained relatively lower. This analysis indicates an opportunity for enhancement and improvement within the inventory management strategy.
- Additionally, Figure 9 provides a visual representation in the form of a line chart, depicting the comparative analysis between the average opening stock and the average sales for the top 20 products.
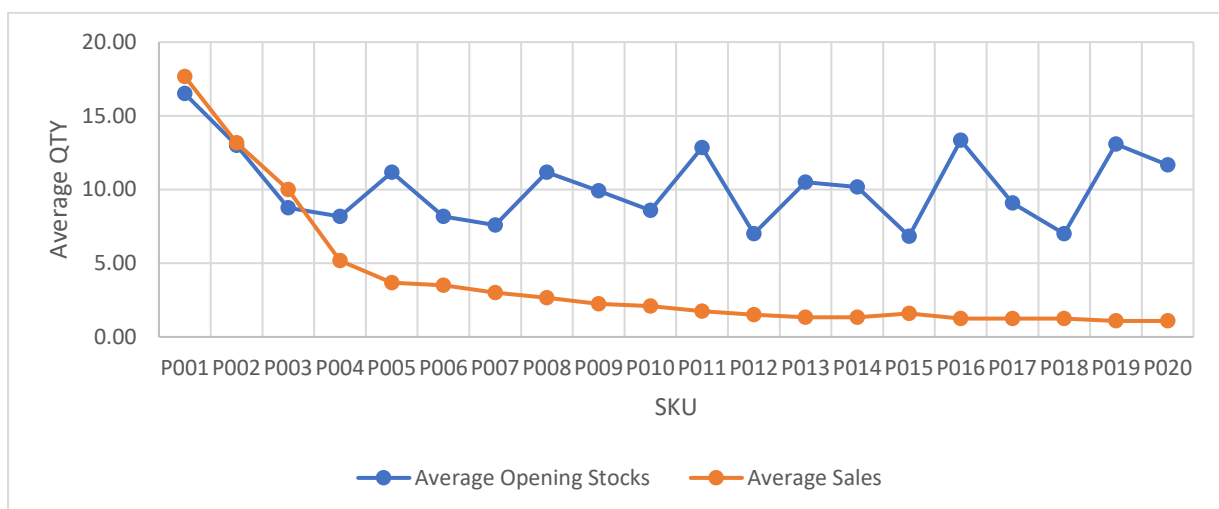
Figure 9 : Line Chart for Average Opening Stocks and Average Sales

- The product P001, P002 and P003 have more average sales which suggests that the ABO should increase the inventory size for these products.
- P016 and P020 have very poor average sales which suggests that ABO should keep minimum stock for these products.

5. Interpretation of Results and Recommendation

I. Interpretation
- Maintaining log records and bills manually instead of a enterprise resource planning software led to inaccuracies in the data. Limited visibility and lack of real time information led to delayed decision making.
- Through an extensive examination using Pareto analysis involving volume and revenue metrics, I identified specific clusters within our distribution channels. These segments were classified as the 'High-value Customer Category,' 'Promising Growth Segment,' and the 'Underperforming Client Category.'
- Gaining insights into trends could aid ABO Sarita Soni in curbing excessive inventory accumulation. The implementation of the Just in Time (JIT) approach can effectively trim stocks in inventory with both low revenue and low volume. This method involves producing these SKUs precisely when they are required, minimizing unnecessary inventory.
- There are certain products to be discarded from the inventory. As their Sales are very low and they are just consuming the Inventory space depicted in figure 10. These slow moving items impacts cash flow and profitability.
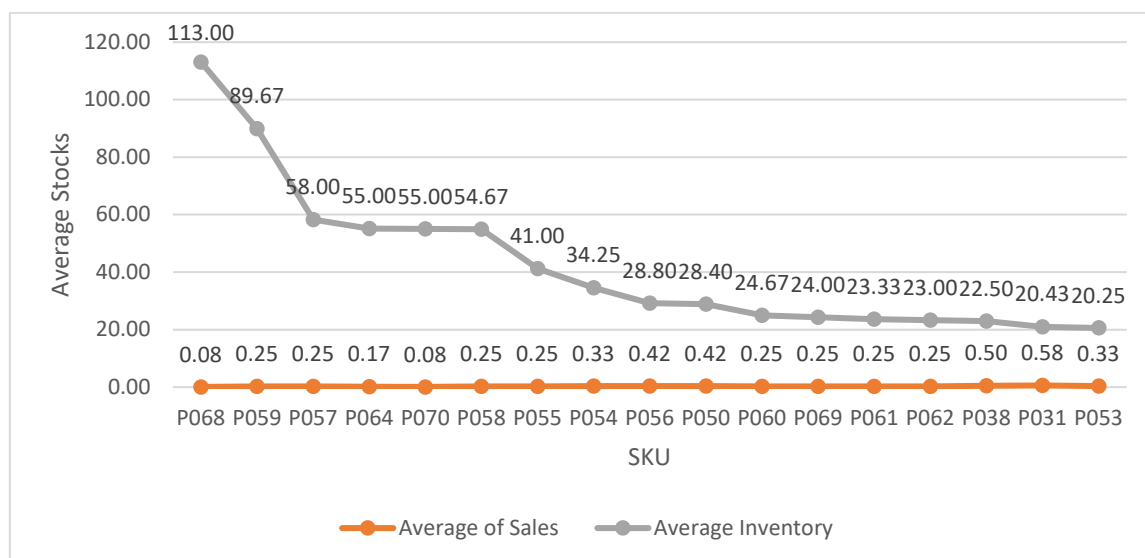

Figure 10 : Line chart showing SKUs to be discarded

- Cash remains the favored choice for 66% of distributors, while digital payment methods are gaining momentum, constituting 34% of transactions. Notably, PhonePe and Paytm have emerged as prominent preferences within this digital landscape. The pie chart showing the preferred mode of payment from the consumer in figure 11.
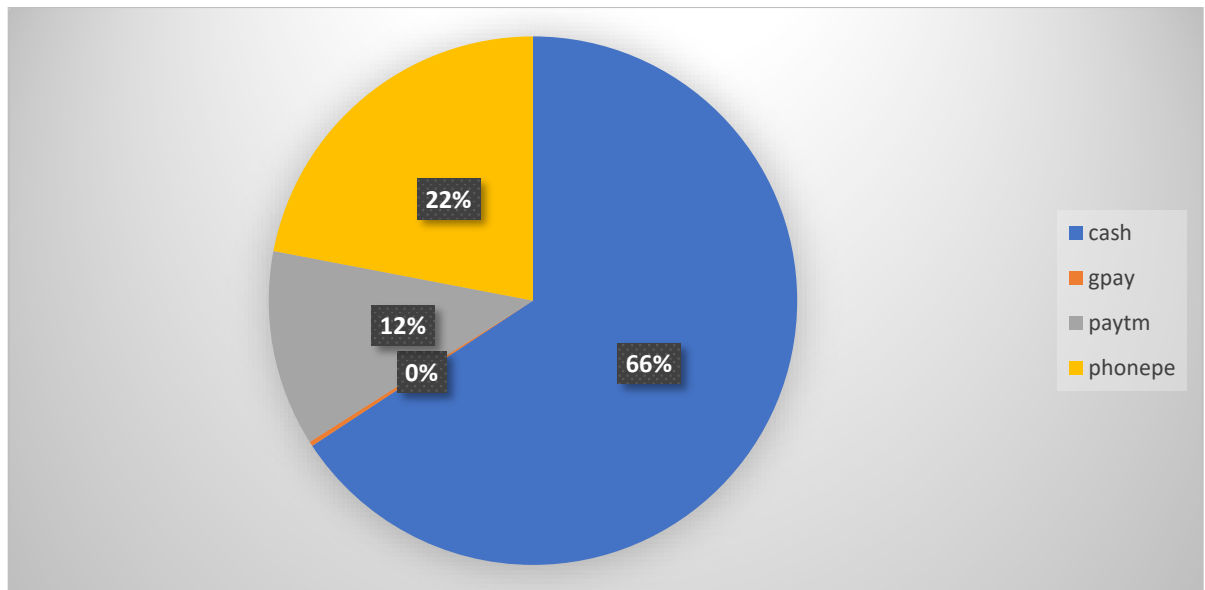
Figure 11 : Pie Chart showing revenue mode

II. Recommendations

- Tool Optimization for Efficiency:
    a) Excel or Khatabook usage can streamline operations for Sarita Soni's Amway venture.
    b) These tools grant quick access to sales and inventory data, aiding better decisions.
- Automation for Error Reduction: Excel or Khatabook automations minimize errors and simplify time-consuming tasks.
- Insightful Analytics Integration:
    a) Integration of reporting and analytics aids in trend analysis and demand prediction.
    b) Helps in efficient inventory management and informed decision-making.
- Elevate Services for Premium Customers:
    a) Offer products on credit to customers C001, C002, C003, C006, and C016, whose purchases exceed Rs. 20,000.
    b) Consider providing free delivery and exclusive discounts to enhance their experience and solidify loyalty.
- Targeted Approach for Aspiring Customers:
    a) Concentrate on developing relationships with aspiring customers like C016, C024, C015, C009, C008, C004, and C007.
    b) Offer enticing deals and exclusive offers to boost their engagement and increase their contribution to revenue.
    c) Consider bundling popular products (e.g., Protein + Daily + Omega combos) to attract and retain these mid-level customers.
- Strategic Neglect of Low-Revenue Customers:
    a) Prioritize resources by deprioritizing customers such as C225, C226, C227, C228, C229, and C239.
    b) Focus efforts on high-potential segments to optimize time and resources.

- Sustained Monitoring for Enhanced Inventory Control: ABO Sarita Soni should maintain a consistent weekly check on inventory levels. This dedicated monitoring allows for well-informed decisions, potentially identifying products with consistently high inventory rates for consideration of removal.
- The SKU P008, P009, P015, etc are labeled as P8, P9, P15 for better labeling purpose to get better visibility in the graph.
- The below scatter plot in figure 12 suggests that the products P8(NUTRILITE® Salmon Omega-3 Softgels), P9(NUTRILITE® Daily) and P15(NUTRILITE® All Plant Protein Powder) are the hero products for the ABO and hence she should focus on them.
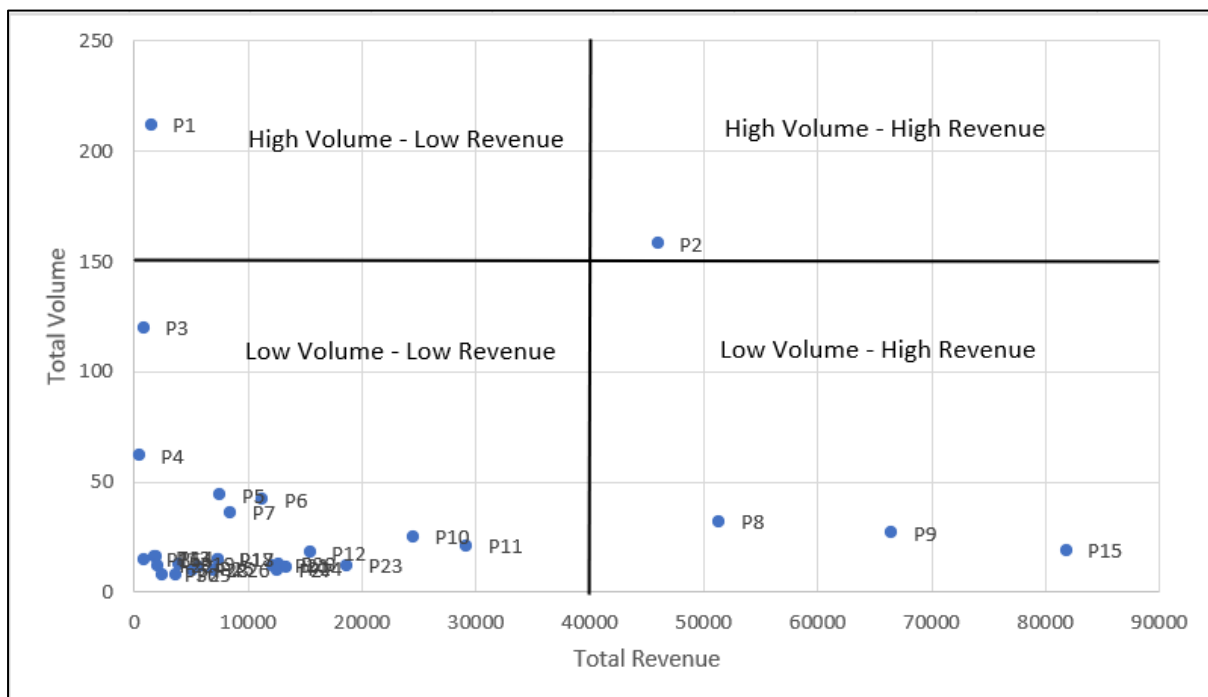

Figure 12 : Scatter Plot showing relation between Revenue and Volume

- To overcome the challenge of perceived affordability, the ABO could leverage a comparative chart akin to the one illustrated in Figure 13. This chart, contrasting our products with those in the market, serves to enlighten customers about the competitive pricing of our offerings.
- Additionally, conducting product demonstrations that highlight their durability could significantly reinforce this message, reassuring customers about the value and cost-effectiveness of our products.

Figure 13 : Market Price Comparison Chart

6. Final Note

Concluding this document, I've come to recognize that resolving contemporary business challenges, particularly in sales and inventory management, isn't as straightforward as it appears. Crafting an efficient solution involves countless hours of research and development, seeking to strike a balance between effectiveness and financial feasibility. The pursuit of analyzing businesses through analytics aims precisely for this—an achievable solution to complex problems bound by various constraints. Thank you for taking the time to delve into this report.