Strengthening Revenue Streams and Supply Chain Efficiency in FMCG Distribution

A Final report for the BDM capstone Project

Submitted by

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Contents

DECLARATION STATEMENT

I am working on a Project "**Strengthening Revenue Streams and Supply Chain Efficiency in FMCG Distribution**". I extend my appreciation to Hapur Sales Corporation, Hapur for providing the necessary resources that enabled me to conduct my project.

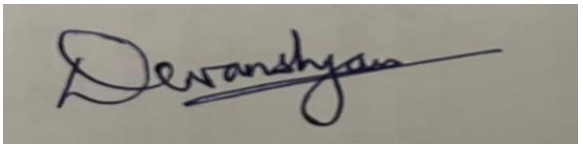
I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability. Additionally, I affirm that all procedures employed 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:



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Date: 03/10/2024

1. EXECUTIVE SUMMARY AND TITLE

Hapur Sales Corporation, founded by Shri Madhav Bansal in Hapur, is a B2B distributor specializing in Fast-Moving Consumer Goods (FMCG). Since its establishment, the company has grown significantly, securing a pivotal dealership with Hindustan Unilever Limited (HUL) in 1984. This partnership has positioned Hapur Sales Corporation as a premier distributor in the region, catering to over 1,000 retailers and earning a reputation for delivering quality products. The company's portfolio includes essential household brands and its operations are guided by a commitment to customer satisfaction and operational excellence. However, sustaining growth in today's competitive FMCG landscape demands addressing several underlying challenges.

The business faces strategic challenges that pose risks to its profitability. Heavy reliance on a concentrated group of high-performing retailers exposes it to financial instability, as setbacks experienced by these key retailers can adversely impact overall revenue. Additionally, frequent stock availability disruptions create inefficiencies, causing delays in delivery and reducing product accessibility for retailers. These challenges hinder sales consistency and can weaken retailer relationships over time, particularly in underperforming market segments.

To address these issues, the report provides actionable insights through data-driven analysis. Inventory optimization strategies, including ABC and Pareto analyses, help prioritize high-value products and streamline stock management. Cohort and retention analysis highlight customer trends, suggesting targeted retention programs to strengthen loyalty. Diversifying the retailer base and implementing outreach campaigns can reduce dependency on key retailers. These measures collectively enable the company to mitigate risks, enhance efficiency, and build a robust foundation for long-term growth and profitability.

2. DETAILED EXPLANATION OF ANALYSIS PROCESS:

2.1 Data Collection Process

The first step was to collective a comprehensive amount of business data. After meeting several owners and proprietors, the owners of Hapur Sales were convinced to share their data as per their settled terms and conditions to the use of data.

- Several meetings were held with the owners to get a comprehensive understanding of their business and to understand the problems which were faced by them.
- Subsequently, adequate amount of data was collected. It was decided that Stock/Inventory and Sales Data would suffice in order to analyse the problems that was being faced by the business.
- The data was collected from 1 April 2023 to 30 September 2023. It involves the sales and inventory/stock movement data.

Business has a heavy reliance on a concentrated group of key retailers. This dependency increases financial risk, as challenges faced by any major retailer could adversely impact the company's financial stability. Additionally, frequent stock availability disruptions cause delays, affecting sales consistency and reducing product accessibility for retailers.

2.2 Data Cleaning

The dataset when received required extensive cleaning processes:

- The date column was not formatted appropriately. Therefore made use of python to format the date as per a standardized format. It involved the use of Python and concepts of excel. Placeholder formula of excel %G1 %H1 %I1 was used to combine and reorganize the date in correct format.

- There were additional redundant columns like CGST and SGST which were not needed for the problem statement which was discussed. Therefore this column was dropped.

- Also there was another column ‘Invoice Total’ which had redundant values for the same invoice number. This column was removed and the Taxable column was used to find the Total Invoice value by grouping the Invoice No.

After multiple conversations with the owner, the names and roles of the columns were also identified.

2.3 Justification and Explanation of Data Analysis

2.3.1 ABC Inventory Analysis(refer figure 3.1.1 and 3.1.2):

ABC analysis is a powerful inventory management tool that categorizes items based on their importance and value.

Category A: High-value items contributing significantly to the total inventory value (70-80% of value).

Category B: Moderate value items (15-25% of values).

Category C: Low-value items with minimal contribution (5-10% of value).

Methodology:

- Calculate the total annual sales value for each item (unit cost × quantity sold).
- Rank items by annual usage value in descending order.
- Calculate cumulative percentages for value and items.
- Categorize items into A, B, or C based on the thresholds.

Category	Value Percentage	Count Percentage
A	67.75	13.04
B	21.79	17.39
C	10.47	69.57

Figure 2.3.1: Table depicting ABC Inventory Analysis

2.3.2 Category Pareto Analysis on the Basis of Revenue Generation(refer figure 3.2):

- Provided insights into the total revenue generation by the top 30 categories, highlighting their individual roles and contributions to the overall revenue.
- The X-axis represents the names of the categories, derived from the ‘HSN Description’ column, while the Y-axis displays the sum of taxable values as total revenue, showcasing each category's revenue contribution.
- The right-hand side of the chart depicts the cumulative contribution of these categories to the total revenue, providing a clear perspective on their overall impact on the business.

- This analysis aids in identifying key revenue drivers and helps businesses prioritize resources and strategies for high-performing categories while addressing opportunities for growth in underperforming ones.

2.3.3 Cohort Chart Analysis/Customer Retention Analysis(refer figure 3.3)**:**

Cohort charts are used to track how the behavior or performance of these groups evolves over time. This analysis is used to identify patterns, trends, and the long-term engagement or retention of users, customers, or any entity being studied.

Methodology:

- Divide customers based on their acquisition month.
- For each cohort, calculate the percentage of customers who remain active in each subsequent month.
- Use a pivot table to display the cohorts in rows and the periods in columns. Each cell represents the retention rate for that cohort at a given time period.
- A **heatmap** is commonly used for cohort analysis because it visually highlights retention trends through color gradients.

X-Axis (Months): Represent the time elapsed since the acquisition.

Y-Axis (Cohorts): Represent the acquisition month.

Cells: Each cell shows the retention rate for a specific cohort in a specific time period.

Cohort	0	1	2	3	4	5
2023-04-01 00:00:00	1061	1003	1011	995	975	1010
2023-05-01 00:00:00	62	36	39	33	35	
2023-06-01 00:00:00	31	17	20	18		
2023-07-01 00:00:00	8	3	3			
2023-08-01 00:00:00	8	3				
2023-09-01 00:00:00	8					

Figure 2.3.3: Making of Cohort Table

2.3.4 Revenue Contribution by Month(refer figure 3.4)**:**

- The X-axis displays months, enabling easy tracking of revenue fluctuations over time. This is helpful for identifying seasonal trends and variations in revenue.
- The Y-axis represents revenue in lakhs, giving a straightforward visualization of financial performance each month. This allows stakeholders to assess monthly revenue levels against targets or previous performance.
- Such visual insights can guide business decisions, like identifying months where extra marketing efforts may be needed or exploring reasons behind revenue dips.

2.3.5 Total Revenue contributed by top 30 outlets based on Invoices(refer figure 3.5)**:**

- This chart visualizes the total sum of invoice amounts generated by various outlets, with each bar representing a specific outlet and its associated revenue contribution. The chart is significant as it provides a clear, comparative view of how much each outlet contributes to the overall revenue, highlighting which outlets generate the most income.

- Its relevance lies in helping stakeholders identify top-performing outlets and understand the distribution of revenue across multiple locations. This information is essential for making data-driven decisions, such as focusing resources on high-revenue outlets, optimizing supply chains, or identifying potential areas for growth among lower-performing outlets.

2.3.6 Total Revenue contributed by top 30 outlets based on 'Invoice No'(refer figure 3.6)**:**

- **Volume Pareto Chart** that displays the revenue contribution of various products, with revenue in rupees on the left vertical axis and cumulative percentage on the right. The bars represent individual products' revenue contributions, while the red line shows the cumulative percentage of total revenue.

- It allows us to quickly see which products generate the most revenue, making it a valuable tool for identifying high-priority products.

- The chart's relevance is in helping businesses focus on their most profitable products, optimize inventory, and potentially identify low-performing items. It provides a clear basis for prioritizing efforts and resources toward the items that drive the most financial value.

3. RESULTS AND FINDINGS

3.1 <u>ABC Inventory Analysis</u>: Top 20 Fast-Moving Inventory Products

- Represent the top-performing products in the inventory, including items like Surf Excel Powder and Wheel Lemon Powder.
- These products contribute approximately 70% of the total inventory value while constituting only about 15% of the total inventory volume. This highlights the Pareto Principle, where a small proportion of items account for the majority of the value.
- The curve visually represents the disproportionate contribution of Category A items to overall inventory value. The sharp rise in the curve emphasizes the importance of prioritizing Category A products for inventory optimization and revenue generation.
- Focusing on Category A items can maximize efficiency and profitability. Insights from this analysis can guide resource allocation and stock management strategies.

Prioritizing the top-performing Category A products, business can optimize inventory management, enhance profitability; making these products key to achieving operational success.

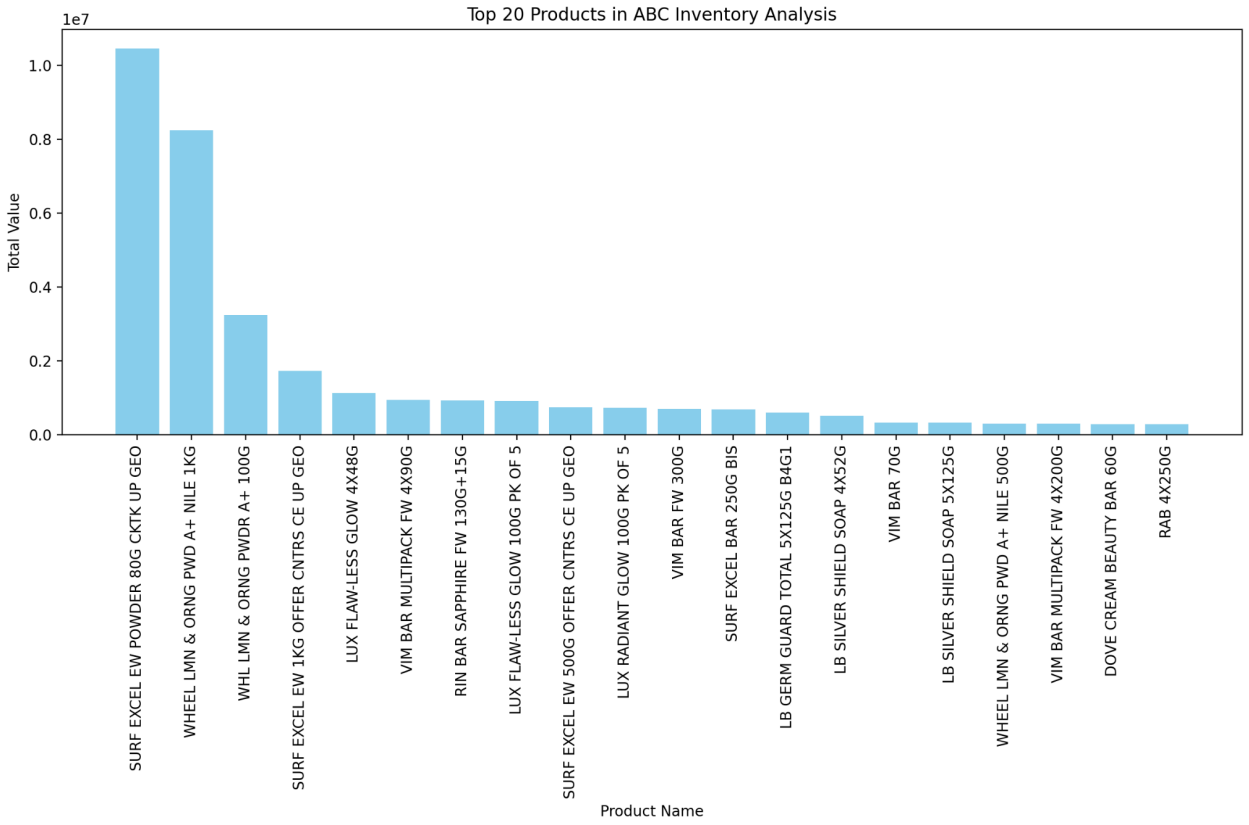

Figure 3.1.1 Top 20 Fast-Moving Inventory Products

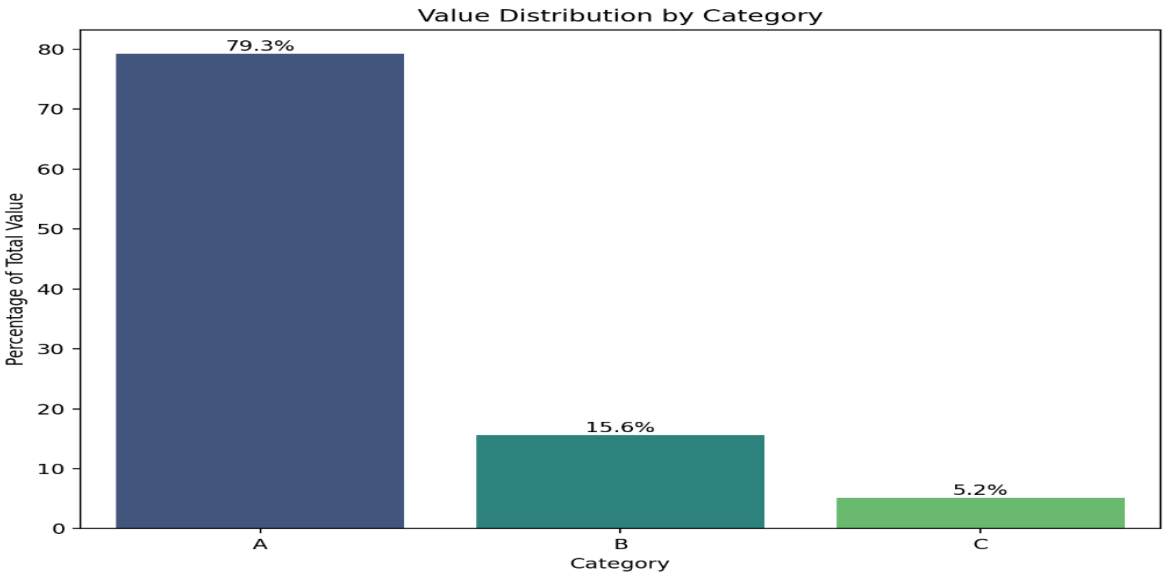

Figure 3.1.2 : A, B, C Category wise Inventory Analysis

3.2 Category Pareto Analysis Based on Revenue Generation

- The chart in Figure 3.2, "Category Pareto Analysis on the Basis of Revenue Generation" highlights the revenue contributions of various product categories.
- This analysis helps identify the top-performing categories that significantly impact overall revenue, aiding in strategic inventory and sales decisions.
- Key insights from the chart:
    1. **Washing Detergents** is the highest revenue-generating category.
    2. **Tea** ranks second in terms of revenue contribution.
    3. **Shampoo** is the third most significant category driving revenue.
    4. The cumulative revenue line, as depicted by the red curve, follows the typical Pareto principle where a small number of categories (approximately the top 20%) contribute to a large portion (around 80%) of the total revenue. This principle helps businesses prioritize inventory management and marketing efforts towards these high-performing categories.
    5. Categories that dominate revenue generation, like washing detergents and tea, should be the focal point of targeted marketing campaigns and promotions. On the other hand, growth strategies for lower-revenue categories could involve bundling them with high-revenue items or creating special promotions to boost their sales.

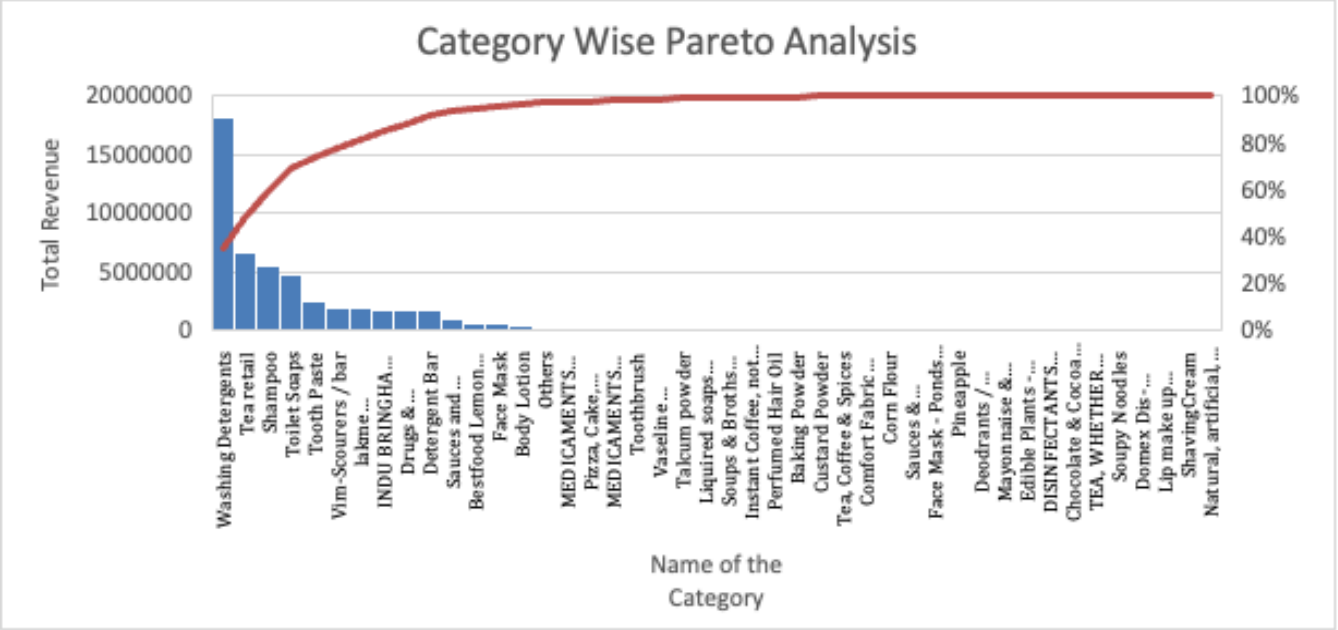

Figure 3.2: Category Pareto Analysis on basis of Revenue Generation

3.3 Customer Retention Analysis

Month wise Retention of Retailers:

- The April 2023 cohort shows excellent retention, maintaining 92% to 95% retention across five months. This indicates strong customer loyalty or satisfaction for that cohort.
- Subsequent cohorts (May 2023 onward) display a noticeable drop in retention after the first month. For example, the May 2023 cohort falls to 58% retention in the first month and steadily decreases, reaching 56% by Month 4.
- July and August 2023 cohorts show the steepest declines, dropping to 38% retention by Month 1 and maintaining that level over subsequent months.

Cohort Performance Comparison:

- The April 2023 cohort is the most consistent in retaining customers across months, while July and August 2023 cohorts have significantly lower retention rates, likely due to changes in customer behavior, product issues, or external factors during those periods.
- Retention seems to stabilize after Month 1 for most cohorts, especially noticeable in the July and August cohorts, where retention remains at 38%.

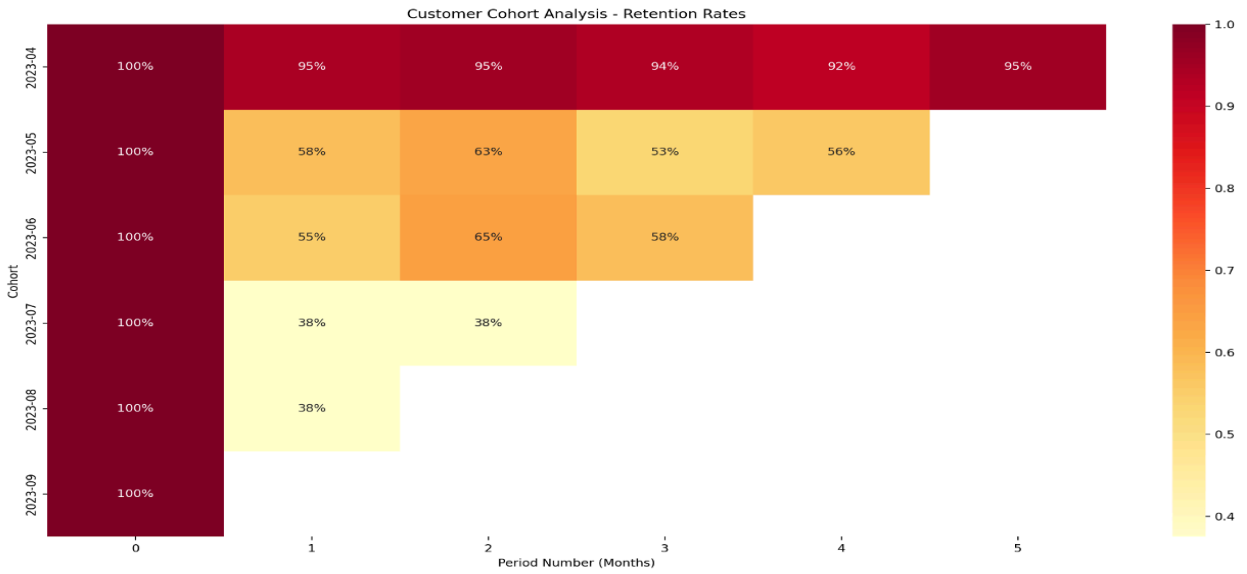

Figure 3.3:Cohort Chart for Customer Retention Analysis

3.4 Total Revenue Contribution by Top 30 Outlets (Based on Invoices)

- **Figure 3.4** illustrates the revenue contributions of the top 30 outlets out of over **1,000+ unique retailers** that the distributor interacts with over a six-month period.
- Key observations from analysis: **Top 30 outlets** account for a significant share of the total revenue, highlighting their critical role in the distributor's business operations. Among these outlets, **Goel Kirana Store** and **Seema Medicos Agency** stand out as the highest revenue contributors, show casing their importance to the distributor's revenue stream.
- This analysis emphasizes the importance of nurturing relationships with top-performing retailers to sustain and grow revenue while exploring opportunities to optimize performance with smaller outlets.

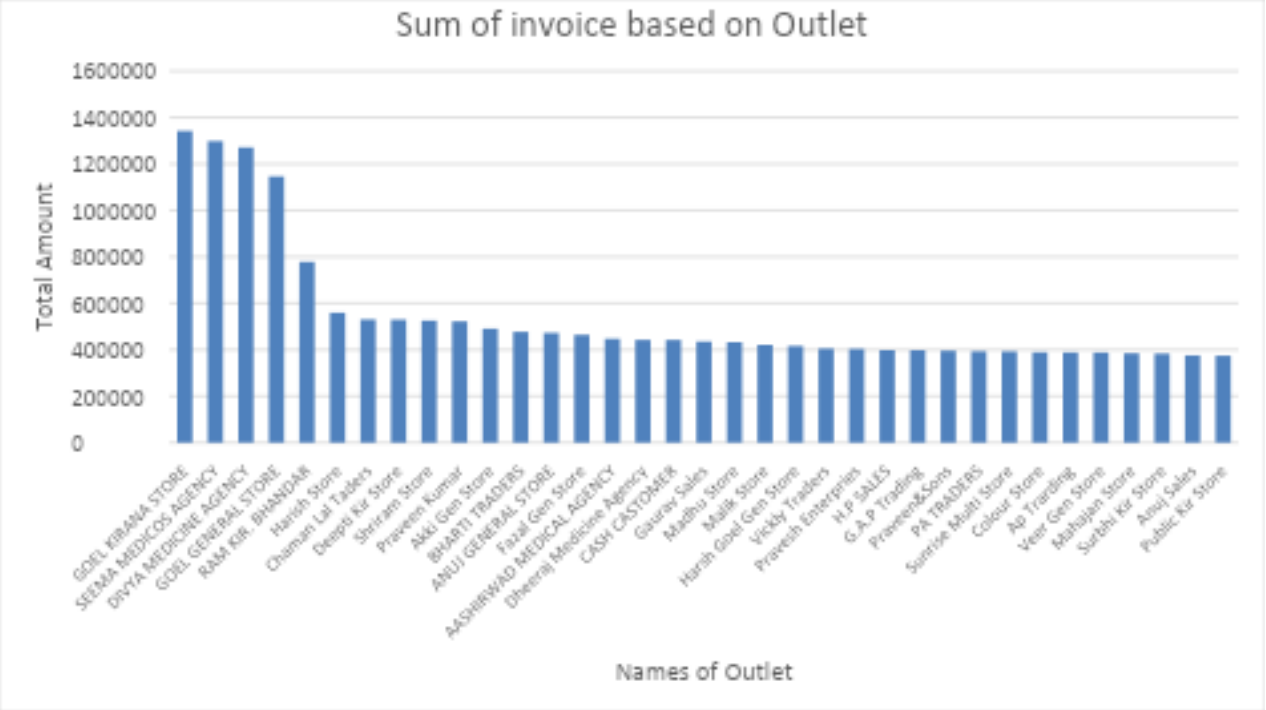

Figure 3.4: Total Revenue contributed by top 30 outlets based on Invoices

3.5 Month Wise Revenue:

The Figure 3.5 shows monthly revenue trends from April to September, with peaks in May and September, and a noticeable dip in July.

- Retailers should prepare for higher demand in peak months by stocking up on essential products, while using lean inventory strategies during slower periods like July.
- Seasonal trends indicate potential for targeted promotions to boost sales.
- Efficient supplier coordination is crucial to avoid stockouts in high-demand months.

Overall, inventory management should align with these patterns for better demand forecasting and cost optimization.

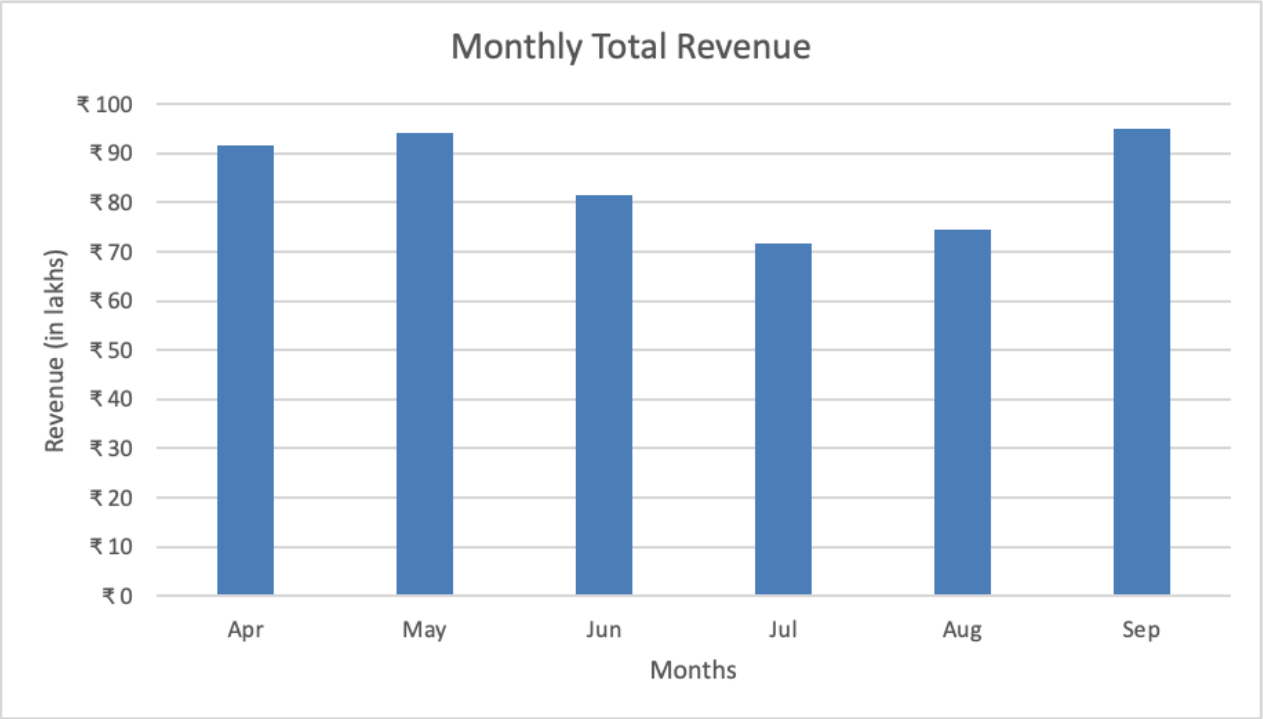

Figure 3.5: Depicts the Revenue Contribution by Month

3.6 Volume Pareto Analysis by Revenue and Total Quantity of Products

Figure 3.6, titled *"Volume Pareto Analysis by Revenue and Total Quantity of Products,"* provides insights into the performance of various products based on revenue and volume.

Key highlights from the chart:

- The analysis identifies the **top-selling products** across all SKUs, emphasizing those that contribute the most to overall revenue.
- It highlights the relationship between the total quantity sold and the revenue generated, helping to pinpoint high-demand, high-impact products.
- This analysis enables better inventory management and strategic focus on top-performing products, ensuring resources are directed towards maintaining or boosting sales of these key items.

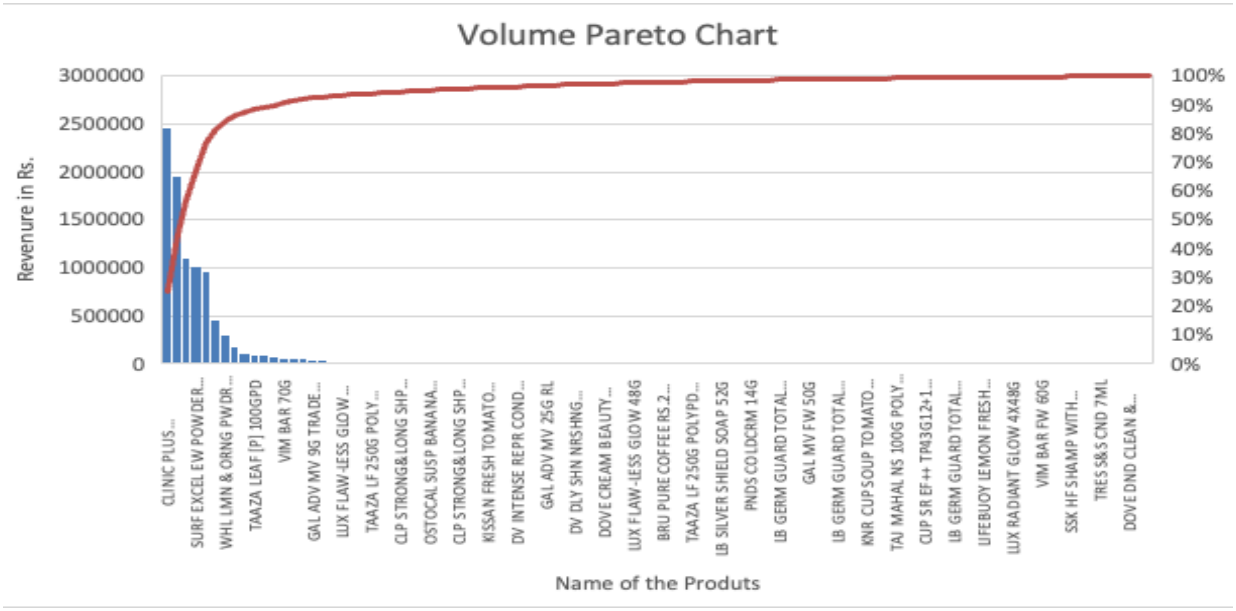

Figure 3.6: Volume Pareto Analysis by Revenue and Total Quantity of Products

4. INTERPRETATIONS:

4.1 Interpretation for Stock Optimisation from ABC Inventory Analysis:

- **Optimized Inventory Levels**: Utilize ABC inventory analysis to focus on Category A products, ensuring accurate demand forecasting and efficient management. This minimizes stockouts and excess inventory, reducing holding costs and improving cash flow.
- **Enhanced Customer Satisfaction**: Prioritize the availability of fast-moving and high-value products (Category A) to consistently meet customer demand and strengthen relationships.
- **Increased Sales and Revenue**: Capitalizing on the top 20 fast-moving products and Category A items can significantly boost sales and overall revenue generation.
- **Improved Profit Margins**: Managing high-value, fast-moving inventory items effectively can lead to increased profit margins and higher overall profitability.
- **Strategic Decision-Making**: Use insights from the ABC analysis to make data-driven decisions regarding product assortment, pricing strategies, and targeted marketing campaigns, ensuring alignment with business goals.

4.2 Interpretation in alignment with Retailer Diversification from Cohort Analysis and Bar Chart Analysis:

4.2.1. Strong Retention in April 2023 Cohort:

- The April 2023 cohort demonstrates outstanding retention rates (95%-92%) over five months. This indicates that customers acquired during this period were highly engaged and loyal. The success could stem from specific campaigns, promotions, or product offerings during that time.

4.2.2. Retention Declines in Subsequent Cohorts:

- Starting from May 2023, retention rates show a significant drop-off after the first month. For instance, the May 2023 cohort retained only 58% of customers in Month 1, and this trend worsens for July and August cohorts, with only 38% retained after the first month. This signals a potential issue in maintaining engagement or satisfaction for newer customers.

4.2.3. Sharp Drop in Retention After Month 1:

- For most cohorts, retention drops dramatically from Month 0 to Month 1. This indicates challenges in onboarding or maintaining customer interest shortly after acquisition. Customers may not be finding enough value in the product/service after their initial interaction.

4.2.4. Consistent Low Retention for Recent Cohorts:

- July and August cohorts plateau at a retention rate of 38% after Month 1, which highlights a persistent issue affecting customer loyalty for newer acquisitions. This suggests systemic challenges, such as changes in offerings, external factors, or ineffective post-acquisition strategies.

4.2.5. Retention Declines Over Time:

- Across cohorts, retention tends to stabilize after the initial sharp decline, as seen in the consistent retention rates from Month 2 onward. This indicates that customers who stay past the initial phase are likely to remain engaged over the long term.

5. RECOMMENDATIONS:

5.1 Recommendations to Manage and Optimize Inventory (from 3.1):

5.1.1. For A-Class Products:

- Frequent monitoring: These products should be tracked daily or weekly to avoid stockouts or overstocking.
- Smaller, frequent orders: Ensure timely replenishment to minimize holding costs without risking shortages.
- Sales Forecasting: Use advanced demand forecasting techniques (based on historical sales, seasonality, etc.) to predict future demand more accurately.

5.1.2. For B-Class Products:

- Balanced inventory management: Review these products periodically (e.g., monthly) and maintain balanced stock levels.

5.1.3. For C-Class Products:

- Bulk ordering: To minimize handling and ordering costs, consider ordering these products in larger quantities and storing them for longer periods.
- Less frequent Ordering: Review these items less frequently (e.g., quarterly), as they are low in value and less critical to cash flow.

5.1.4. Inventory Optimization Strategies:

- Just-in-Time (JIT) Inventory for A-class products, reducing holding costs by ordering closer to the time when the product is needed.
- Maintain Buffer stock: For critical A-class products, maintain a buffer of safety stock to avoid stockouts during demand surges.
- Discount on C-class items: since they are slow-moving, to free up cash and warehouse space for higher-value items.

5.2 Recommendations to Reduce Retailer Dependency:

- Retailer Mapping: Start by segmenting retailers into high, medium, and low contributors using sales data. Identify underserved regions where market penetration is low, and prioritize expanding outreach efforts there(from 3.3).
- Outreach Campaign: Instead of broad-based offers, introduce targeted promotions, such as exclusive rebates for first-time buyers or tailored credit facilities for underperforming areas. Collaborate with local distributor networks to conduct product demonstration events in these areas, encouraging participation(from 3.3).
- Retailer Development Program: Initiate campaign programs, where smaller retailers receive performance-based incentives such as free promotional materials, loyalty rewards, or participation in exclusive training sessions(from 3.3 and 3.4).