ANALYTICAL STUDY OF DURGA MEDICAL HALL

CAPSTONE PROJECT END-TERM SUBMISSION

Submitted by

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1. Executive Summary and Title

Durga medical shop is a medicine store which was established in 1987 by Nageshwar Sharma. It is retailer medical shop. Medical shop provides various healthcare-related products, including prescription and over the counter medications, medical equipment, and health-related items.

In the process of analyzing sales and expenditure data, a systematic approach was adopted, which involved the computation of key financial metrics for 10 distinct products. The analysis of profit and loss addressed the issue of declining profits by employing complex formulas for daily and SKU-level evaluations. The optimization of inventory management was achieved through comprehensive data collection specific to each SKU and detailed calculations, thereby addressing the challenge of excess stock accumulation. These analyses, which utilized key business terms, precise formulas, and a professional tone, laid a solid foundation for strategic decision-making, thereby enhancing the shop's resilience in the face of evolving market dynamics.

The analysis of sales and purchase volumes revealed fluctuating revenue trends, with key products like Zeet Cough Syrup, Betnovate C, and others contributing 80% to total revenue. The examination of revenue at the SKU level identified Zeet Cough Syrup as the top earner, while Calpol Tablet lagged behind. The correlation analysis highlighted fluctuations between proportions of revenue and sales volume. Strategic recommendations included replacing less profitable items like Calpol Tablet. The analysis of profit/loss revealed top performers like Candid Powder and Gesicube Oil, indicating potential for profit optimization. The Pareto chart emphasized the dominance of cough syrup medications in total profit. The inventory analysis stressed the importance of aligning stock levels with sales trends and optimizing these levels for enhanced profitability.

2. Detailed Explanation of Analysis Process

2.1 Data Analysis for Sales and Expenditure

I am using Microsoft Excel for the systematic cleaning, analysis, and aggregation of data collected over a period of 31 days. The data, initially unstructured, is organized into a structured format for ease of analysis.

	SALES									
	TABLET/CAPSULE		SYRUPS		OINTMENT		POWDER		OIL	
DATE	Decolic Tab	Calpol Tab	Becosules syp	Zeet cough syrup	Betnovate©	Neosporin omt	Candid	Nebasulf	Orthotix	Gesicube
22-09-2023	10	20	11	18	1	1	1	5	1	1
23-09-2023	9	23	9	12	11	4	2	5	1	2
24-09-2023	10	32	8	11	10	3	1	4	0	2
25-09-2023	10	20	7	11	18	6	3	3	0	2
26-09-2023	9	19	9	1	29	4	1	4	2	0
27-09-2023	8	20	6	10	21	3	1	3	1	1
28-09-2023	9	25	5	9	21	3	0	2	1	3
29-09-2023	9	26	9	12	9	3	0	2	2	2
30-09-2023	10	22	10	12	0	2	0	1	0	2
01-10-2023	10	22	11	11	19	2	2	4	3	1
02-10-2023	9	32	3	2	15	8	1	3	0	2
03-10-2023	9	28	6	20	17	5	2	2	2	1
04-10-2023	10	35	4	11	10	3	2	2	1	2
05-10-2023	8	34	4	19	6	6	0	1	1	0
06-10-2023	10	32	10	15	9	5	2	3	2	0

Snapshot of Sales data (1.1)

The first step involves the creation of a sales dataset comprising 10 distinct product categories, namely Decolic, Calpol, Becosules Syrup, Zeet Cough Syrup, Betnovate C, Neosporin, Candid, Nebasulf, Orthotix, and Gesicube. Corresponding to each product, a column is dedicated to its selling price.

Subsequently, I calculated key financial metrics such as Revenue, Total Revenue, Average Selling Price, and Average Revenue. The formula used for calculating Revenue is as follows:

$$\text{Revenue} = \text{Selling Price} \times \text{Sales}$$

Similarly, a Purchases dataset is created with corresponding purchase quantities and purchase prices.

By leveraging the Purchases dataset, I computed Expenditure, Total Expenditure, Average Expenditure, and Average Purchase Price. The formula used for calculating Expenditure is as follows:

$$\text{Expenditure} = \text{Purchase Quantity} \times \text{Purchase Price}$$

This comprehensive analysis provides valuable insights into the financial performance of the product portfolio, aiding in strategic decision-making.

2.2 Increase the overall profit of the business

In the course of my interaction with the business owner, it was revealed that the retail landscape has been significantly transformed by the advent of online shopping platforms, the proliferation of malls, and the emergence of new retail outlets. These developments have exerted considerable pressure on the profitability of the shop, making it increasingly challenging to maintain a competitive stance in the market.

DATE	TOTAL SALES	TOTAL EXPENDETI	PROFIT/LOSS
22-09-2023	3429.74	824.1	2605.64
23-09-2023	3950.68	0	3950.68
24-09-2023	3264.77	1932.7	1332.07
25-09-2023	4299.13	2627.2	1671.93
26-09-2023	3281.38	4462.5	-1181.12
27-09-2023	3536.93	0	3536.93
28-09-2023	3486.17	2462.8	1023.37
29-09-2023	3279.63	9179.9	-5900.27
30-09-2023	2388.6	0	2388.6
01-10-2023	4179.29	538.7	3640.59
02-10-2023	2870.04	0	2870.04
03-10-2023	4888.06	1939.3	2948.76
04-10-2023	3330.31	2050.7	1279.61
05-10-2023	3453.8	569.9	2883.9
06-10-2023	3996.25	250	3746.25

Snapshot of Expenditure of data (1.2)

To navigate this complex business environment, it is crucial to undertake a comprehensive financial analysis. The first step in this process involves calculating the profit or loss for each day and for each Stock Keeping Unit (SKU). This is achieved by utilizing the sales and purchases data.

The formula for calculating profit is as follows:

Profit = Sales - Purchase

This formula allows us to determine the net income generated from the sales of each SKU, taking into account the cost of goods sold (i.e., purchases). By subtracting the total

purchases from the total sales for each day and SKU, we can ascertain the daily profit or loss.

Furthermore, to understand the contribution of each SKU to the overall profitability of the business, we calculate the profit percentage for each SKU relative to the total profit. The formula used for this purpose is:

$$\text{Profit SKU \%} = (\text{Profit SKU}) / (\text{T. Profit}) \%$$

This calculation provides a measure of the relative profitability of each SKU, offering valuable insights into the performance of different product categories. By identifying the most and least profitable SKUs, the business owner can make informed decisions about inventory management, pricing strategies, and marketing efforts.

This analytical approach not only enables a detailed examination of the shop's financial performance but also provides a robust framework for strategic decision-making. By integrating key business metrics and precise formulas, we can ensure a professional and comprehensive analysis that is well-equipped to navigate the challenges posed by the evolving market dynamics. This, in turn, can enhance the shop's resilience and adaptability, thereby bolstering its competitiveness in a rapidly changing retail landscape.

2.3 Optimizing inventory

The business owner highlighted a critical challenge: the accumulation of excess stock towards the end of each month. This issue, in conjunction with declining profits, has made it increasingly difficult to procure new inventory, especially in the face of escalating inflation.

To address this, a meticulous process of inventory data collection for each SKU in the shop was undertaken. This process involved the use of sales data, purchases data, and initial inventory data. The formula used to calculate the inventory is as follows:

$$\text{Inventory} = \text{Initial Inventory} - \text{Sales} + \text{Purchase}$$

This formula allowed me to determine the remaining stock for each SKU at the end of the period. It takes into account the initial inventory at the start of the period, the total sales during the period, and any additional purchases made during the period.

Subsequently, using the calculated inventory data, the total inventory and average inventory were determined. The total inventory provides a measure of the overall stock level in the shop, while the average inventory offers an insight into the typical stock level for each SKU.

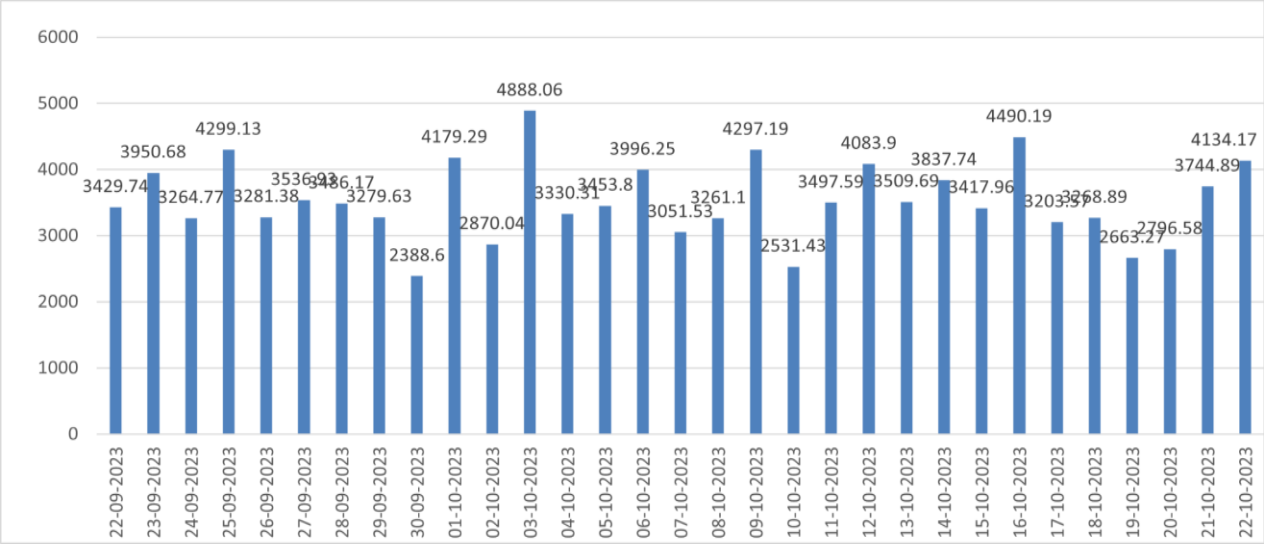
TOTAL INVENTORY	AVG INVENTORY	DATE
880	88	22-09-2023
816	81.6	23-09-2023
738	73.8	24-09-2023
677	67.7	25-09-2023
655	65.5	26-09-2023
627	62.7	27-09-2023
553	55.3	28-09-2023
790	79	29-09-2023
821	82.1	30-09-2023
762	76.2	01-10-2023
687	68.7	02-10-2023
612	61.2	03-10-2023
533	53.3	04-10-2023
513	51.3	05-10-2023
439	43.9	06-10-2023

Snapshot of Inventory of data (1.3)

This comprehensive approach to inventory management not only helps in addressing the immediate challenge of excess stock accumulation but also provides valuable insights for strategic decision-making. By understanding the dynamics of inventory movement, the business owner can make informed decisions about procurement, sales strategies, and inventory optimization, thereby enhancing the shop's resilience and adaptability in a challenging economic environment. This, in turn, can contribute to improved profitability and business sustainability.

3. Results and Findings

3.1 Volume Analysis (Sales, Purchase)



Graph 2.1: Revenue Trend over a month

From the above graph, it is evident that the revenue process does not exhibit a consistent pattern but fluctuates throughout the month. This necessitates a daily analysis for the entire month to gain a comprehensive understanding of the revenue dynamics.

Here are some key observations from the analysis:

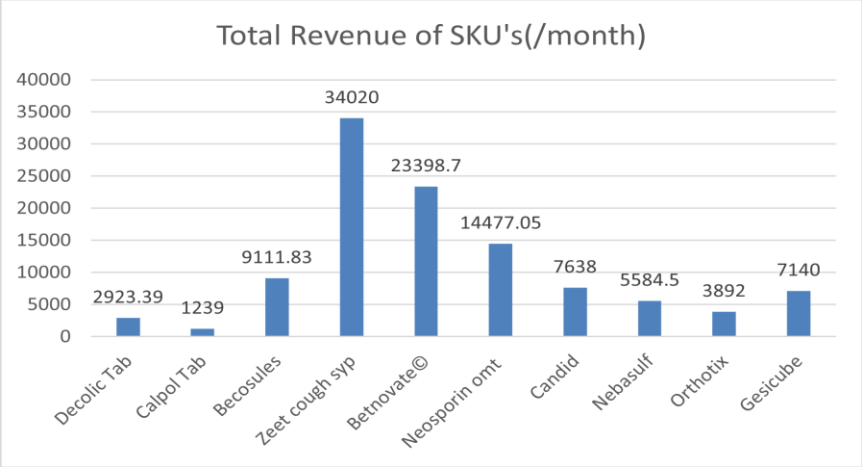
- The **average revenue** for the month stands at **₹3529.82**. This represents the mean revenue per day and provides a benchmark against which individual day revenues can be compared.

- The **maximum revenue** recorded in the month is **₹4888.06**. This represents the highest daily revenue achieved, indicating the peak sales performance.

- The **minimum revenue** for the month is **₹2388.6**. This represents the lowest daily revenue, highlighting the days with the least sales.

- The **range of revenue**, calculated as **₹2499.46**, represents the difference between the maximum and minimum revenues. This metric provides an indication of the variability in daily revenues.

These metrics provide a quantitative overview of the revenue process, offering valuable insights into the financial performance of the business over the course of the month. By understanding these dynamics, strategic decisions can be made to optimize revenue generation and enhance business profitability.



Graph 2.2: Revenue for each SKU over a month

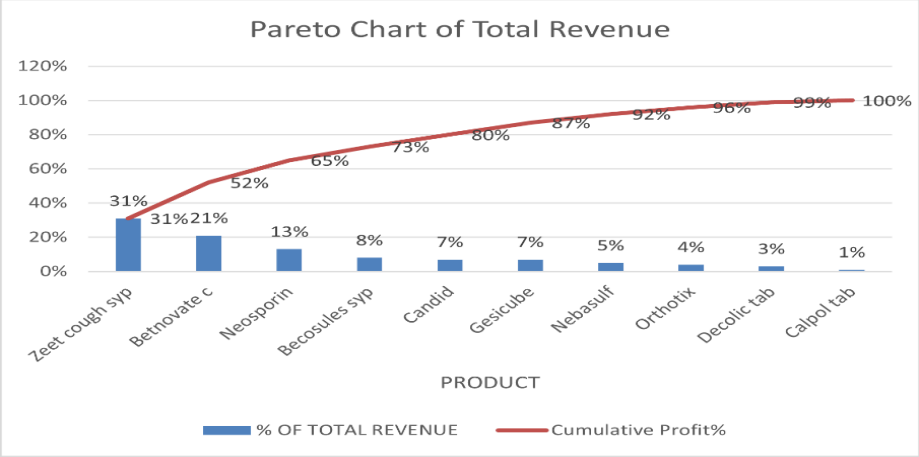
Upon examining the below graph, it is evident that the primary revenue drivers for the shop are Zeet Cough Syrup, Betnovate C, Neosporin, Becosules Syrup, and Candid. These products collectively contribute to 80% of the total revenue generated by the shop, underscoring their significance in the shop's product portfolio.

In terms of product categories, syrups and ointments play a pivotal role in total revenue generation, while tablets contribute the least to the SKU category revenue. This insight can guide the shop's inventory management and marketing strategies, focusing on highperforming categories while exploring ways to enhance the performance of underperforming ones.

The SKU with the maximum total revenue is Zeet Cough Syrup, indicating its popularity among customers and its substantial contribution to the shop's financial performance. On the other hand, Calpol Tablet generates the minimum total revenue among all SKUs, suggesting a need for strategic interventions to boost its sales.

The Pareto chart of revenue provides a visual representation of the contribution of each SKU to the total revenue. It enables a quick identification of the top-performing SKUs, following the Pareto principle that 80% of effects come from 20% of causes.

The chart below further illustrates the proportion of total revenue and total sales volume for each SKU over a month. This comprehensive view allows for a nuanced understanding of the sales dynamics and revenue generation patterns, facilitating informed decision-making for business growth and profitability enhancement.



Graph 2.3: Pareto chart of Total Revenue

From the below graph, I inferred that the proportions of revenue and sales volume are generally correlated. However, there are notable exceptions where significant fluctuations are observed.

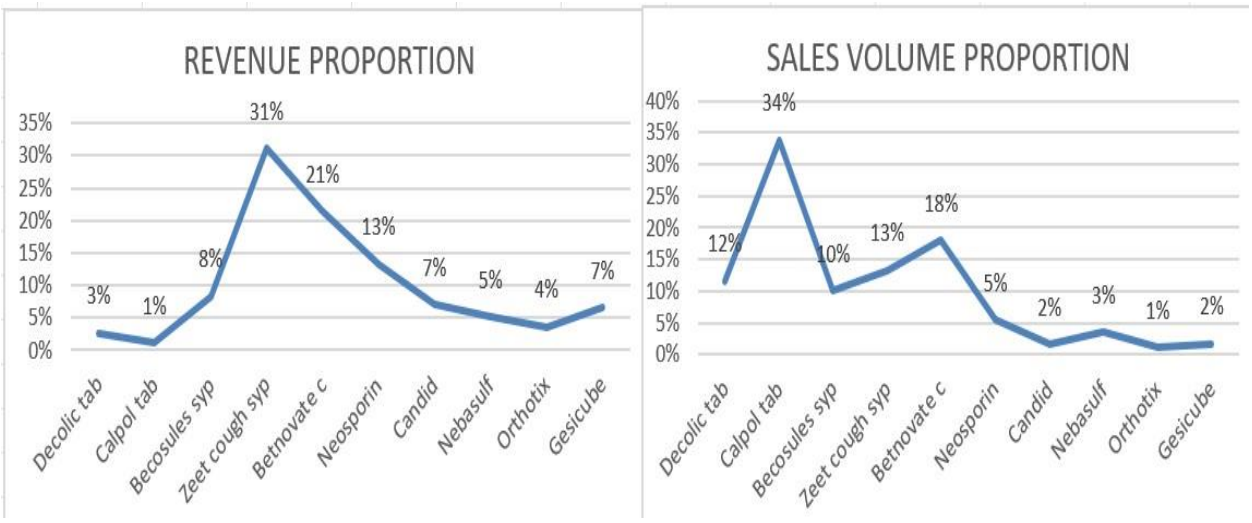
For instance, the Calpol tablet exhibits a high-sales volume proportion but contributes relatively low revenue. Conversely, Zeet Cough Syrup, despite having a moderate sales volume proportion, contributes significantly to the revenue.

This discrepancy can be attributed to the pricing of the products. The Calpol tablet, despite its high sales volume, may not contribute significantly to the revenue due to its lower price point. On the other hand, Zeet Cough Syrup, with its higher price point, contributes more to the revenue despite its moderate sales volume.

In light of this, one potential strategy to increase the net profit of the shop could be to replace the Calpol tablet with a more expensive alternative that contains the same active ingredients, such as the Nise or Sumo tablets. This could potentially increase the revenue contribution of this SKU without significantly impacting the sales volume.

However, it's important to note that these fluctuations are observed in only a few products. Overall, the majority of the products do not exhibit significant discrepancies between their sales volume and revenue proportions. This suggests that, for most products, the pricing strategy is well-aligned with the sales volume, contributing to a balanced revenue stream.

This comprehensive analysis provides valuable insights into the shop's revenue generation and sales dynamics, facilitating strategic decision-making for business growth and profitability enhancement.

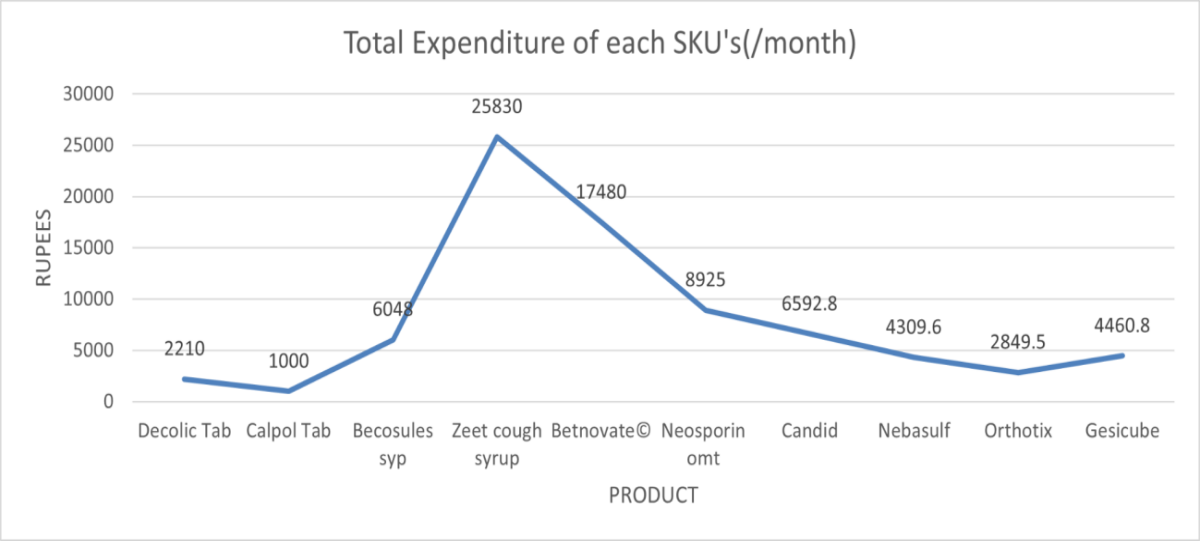


Graph 2.4 and 2.5: Revenue Proportion and Sales Volume Proportion

The graph below illustrates that Zeet Cough Syrup incurs the highest total expenditure, while Calpol has the lowest. Interestingly, this pattern mirrors the trend observed in total revenue, suggesting a correlation between expenditure and revenue for these products.

Furthermore, it is evident that the categories of syrup and ointment incur high expenditures. This observation aligns with the total revenue pattern, where these categories also generate high revenues. This correlation could be attributed to the higher price points or greater sales volumes of these product categories.

In essence, the analysis reveals a consistent pattern between expenditure and revenue across different SKUs and product categories. Understanding these dynamics can provide valuable insights for strategic decision-making, inventory management, and pricing strategies, ultimately contributing to the shop's profitability and sustainability in a competitive market landscape.



Graph 2.6: Total Expenditure of each SKU's per month

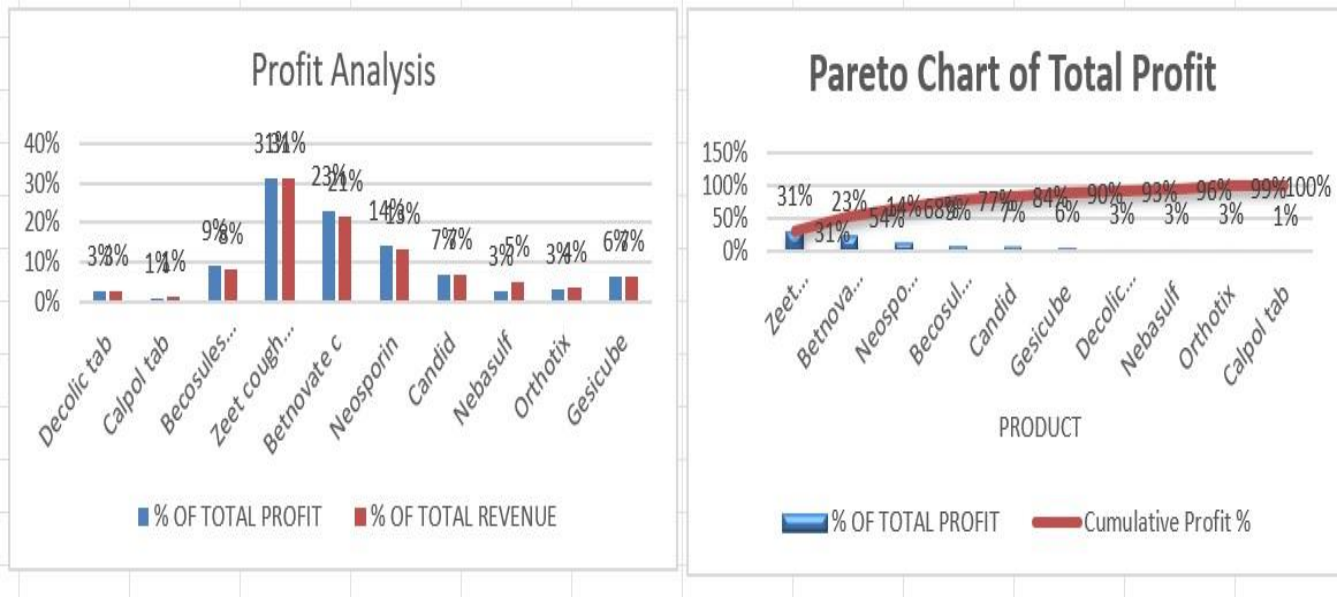
3.2 Profit/loss Analysis

Graph 2.7 and 2.8: Comparison between Average Sales Price and Average Purchase Price for each SKU

The graph above reveals that Candid Powder and Gesicube Oil yield the maximum profit, despite accounting for only 2% of the sales volume proportion each. This suggests that these products have a high profit margin and contribute significantly to the net profit of the shop.

This observation underscores the importance of data analysis in retail management. By dedicating time to analyze the medical data, the shopkeeper can identify high-profit products and strategically focus on promoting them. In this case, increasing the sales of Candid Powder and Gesicube Oil could potentially enhance the shop's net profit.

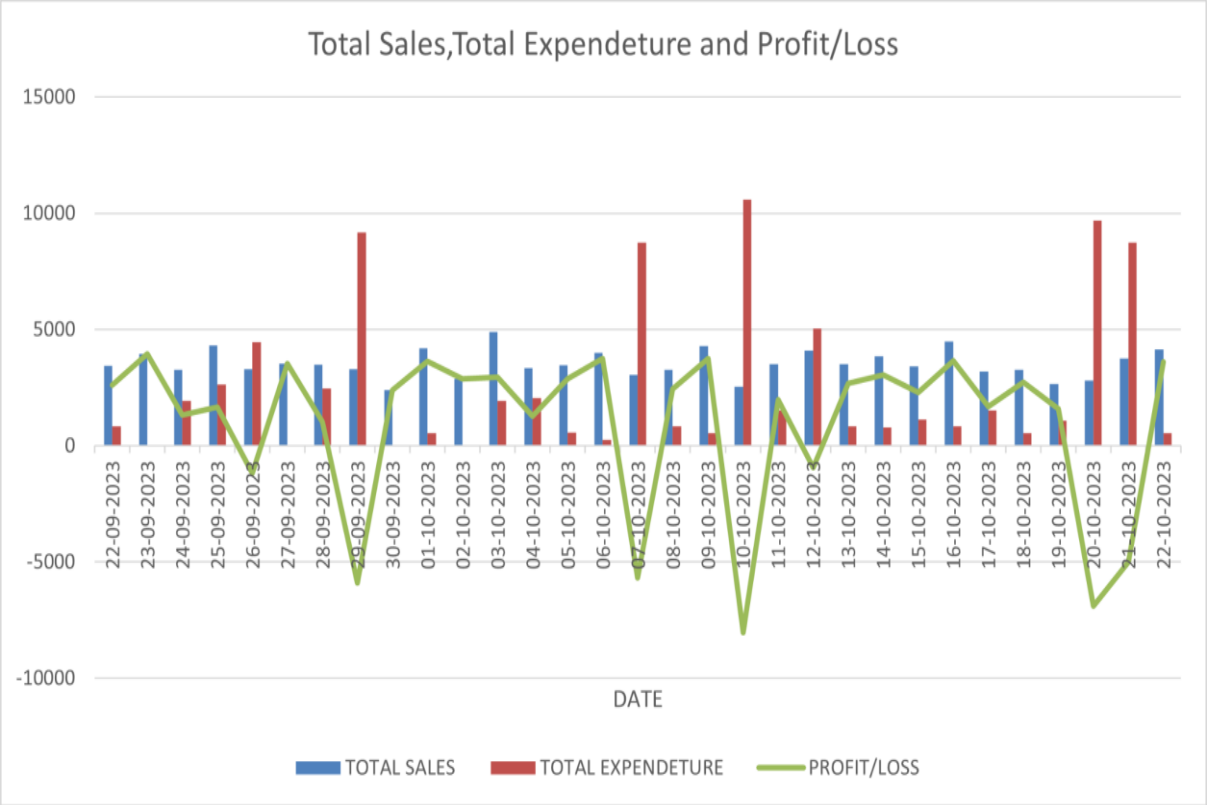
However, it's important to consider other factors such as customer demand and market trends when making strategic decisions. While these products are currently profitable, their performance may vary over time due to changes in consumer preferences, competition, and other market dynamics.



Graph 2.9 and 2.10:

The subsequent profit analysis graph offers a detailed perspective, revealing a moderate level of profit across all Stock Keeping Units (SKUs). Notably, SKUs with high total revenue correspondingly exhibit high total profit, while those with low total revenue demonstrate lower total profit. This correlation underscores the pivotal role that revenue plays in determining overall profitability.

The Pareto chart for total profit further shows the contributions of each SKU to the shop's total profit. Remarkably, 80% of the total profit is attributed to five key SKUs: Zeet Cough Syrup, Betnovate C, Neosporin, Becosules Syrup, and Candid Powder. Among these, the syrup category is particularly prominent, suggesting that cough syrup medications are especially profitable compared to other product categories.

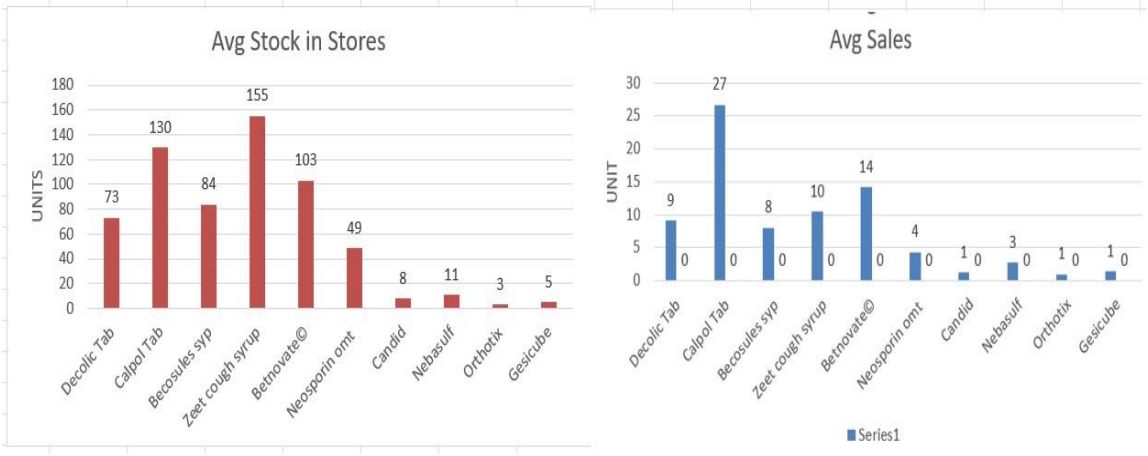


Graph 2.11:

The subsequent graph provides a detailed analysis of the gross profit/loss over the course of the month. It is noteworthy that the shop experienced a period of significant profitability from September 30 to October 6 and again from October 13 to October 19. These periods represent a phase of robust financial performance, during which the shop achieved substantial gross profit. This warrants a deeper investigation into the factors that contributed to this success.

In conclusion, these comprehensive analyses equip the shop owner with valuable insights for strategic decision-making. By fine-tuning the product mix, optimizing pricing strategies, and capitalizing on high-performing SKUs, the shop stands to enhance its overall profitability and effectively navigate the challenges of the market.

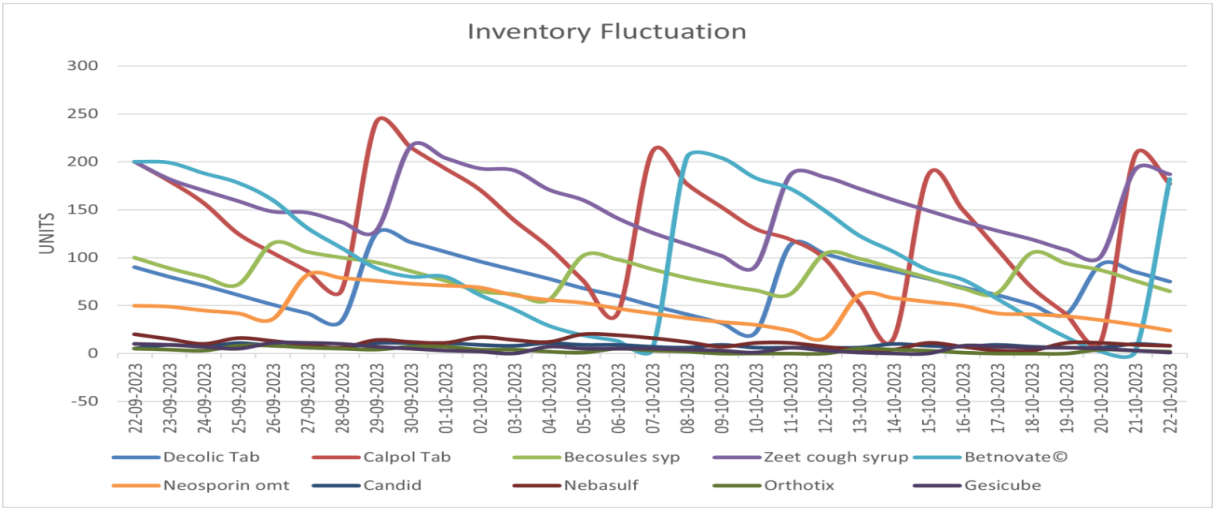
3.3 Inventory Analysis



Graph2.12 and Graph 2.13:

The inventory analysis is instrumental in gaining a comprehensive understanding of the stock management practices within the shop. The presented graph elucidates a discernible strategy wherein inventory levels are closely aligned with sales performance. Products experiencing high sales are correspondingly maintained at elevated stock levels, reflecting a prudent approach to meet customer demand efficiently.

However, a critical observation surfaces with Zeet Cough Syrup, where despite exhibiting a substantial stock level, the corresponding sales figures do not align proportionately. This incongruity prompts a strategic consideration, suggesting that optimizing stock levels by reducing quantities for certain products could yield enhanced profitability. This aligns with established inventory management principles, emphasizing the importance of minimizing excess stock to mitigate carrying costs and capitalize on potential profit maximization.



Graph (2.14)

The above graph delves into the nuanced analysis of inventory fluctuation over the month. This portrayal provides a clear and insightful depiction of how stock levels dynamically respond to sales trends. The synchronization between sales and inventory fluctuation is evident, reinforcing the owner's astute approach to maintaining inventory in accordance with market demands.

In essence, this inventory analysis underscores the significance of a dynamic and responsive stock management strategy. By aligning inventory levels with sales patterns and strategically optimizing stock quantities, the shop has the potential to enhance operational efficiency, reduce holding costs, and ultimately bolster overall profitability. This data-driven approach contributes to a more resilient and adaptive business model in the ever-evolving retail landscape.

4 Interpretation of Results and Recommendation

4.1 Increase the Sales of High-Profit Items (Candid Powder and Gesicube Oil)

Interpretations:

- The analysis reveals that Candid Powder and Gesicube Oil are the top performers in terms of profit generation, despite accounting for only 2% of the total sales volume. This highlights the significant profit margins of these products and their contribution to the shop’s profitability.

- Candid Powder, which is primarily used during the summer season for various applications, presents a strategic opportunity for promotion. By offering discounts or competitive pricing, the shop could potentially increase the sales volume of this product, thereby enhancing its revenue contribution.

- Similarly, Gesicube Oil, which is in high demand for treating joint pain, offers an opportunity for increased sales. By catering to the prevalent health concerns of the older demographic, the shop could potentially boost the sales of this product. This targeted approach could not only increase the shop’s revenue but also enhance its reputation as a provider of solutions for common health concerns.

Recommendations:

- Implement strategic pricing strategies for Candid Powder, aligning with or offering competitive prices to those of online shops, malls, and new establishments.
- Capitalize on the demand for joint pain relief by enhancing the promotion and accessibility of Gesicube Oil, potentially through collaboration with healthcare professionals.

4.2: Focus on High-Selling Items and Increase Sales

Interpretations:

- Products like Zeet Cough Syrup experience high demand during the winter season. This presents a unique opportunity to introduce complementary products like Cufof-X cough syrup and tablets. By offering a comprehensive range of cold and cough remedies, the shop can cater to the increased demand during the winter season. This could potentially lead to an increase in sales volume, thereby enhancing the shop's revenue.

- Becosules Syrup is part of the top 5 SKUs contributing to 80% of the profit. As a multivitamin supplement, it offers numerous health benefits. By educating customers about these benefits, the shop can potentially increase the sales of this product. This could involve providing informational materials, conducting health awareness campaigns, or training staff to effectively communicate the benefits of Becosules Syrup to customers.

- Betnovate C Cream, which follows Zeet Cough Syrup in sales, can see a boost by highlighting its applications for various skin issues. By informing customers about the various uses of the cream, the shop can potentially increase its sales. This could involve displaying informational posters, providing product leaflets, or training staff to effectively communicate the applications of Betnovate C Cream to customers

Recommendations:

- To capitalize on seasonal demand, consider introducing complementary products that offer a comprehensive solution for common health issues. For instance, during the winter season, when the demand for cough syrups like Zeet Cough

Syrup increases, introducing complementary products like Cufof-X cough syrup and tablets can cater to a wider range of customer needs. This strategy not only enhances customer satisfaction but also increases the potential for cross-selling, thereby boosting overall sales.

- Enhancing awareness and sales of specific products like Becosules Syrup and Betnovate C Cream can be achieved through targeted marketing and customer education strategies. For Becosules Syrup, a multivitamin supplement, educating customers about its health benefits can encourage more purchases. Similarly, for Betnovate C Cream, highlighting its various applications for skin issues can increase its sales. These strategies can involve in-store promotions, informational leaflets, staff training etc.

4.3: Strategic Inventory Management

Interpretation:

- The shop's inventory management generally aligns well with sales. However, an incongruity is observed with Zeet Cough Syrup, which maintains a higher stock level compared to its sales. This discrepancy could potentially lead to overstocking, tying up capital that could be used elsewhere in the business.

Recommendation:

- Implement strategic adjustments to the stock levels of Zeet Cough Syrup based on its sales patterns. This could involve reducing order quantities, increasing order frequency, or a combination of both. By enhancing the alignment between stock levels and sales, the shop can optimize its inventory turnover, reduce holding costs, and ultimately enhance profit margins. Regular review of sales and inventory data will be crucial to ensure the effectiveness of these adjustments and make further refinements as needed.

4.4: Additional Steps to Increase Revenue

Recommendations:

- Products with high-margin pricing, such as Gesicube Oil, can benefit from doctor recommendations, particularly for patients facing joint pain problems. This targeted approach can potentially increase the sales of this product, thereby enhancing its contribution to the shop's profitability.

- Despite high sales, certain products like Decolic Tablet could explore adding a new tablet with a higher price to increase overall sales and profit. This strategy can potentially enhance the revenue contribution of this SKU without significantly impacting its sales volume.

- Collaborate with doctors to promote prescription recommendations for products available in the shop. This strategy can enhance the visibility of the shop's products, increase customer trust, and potentially boost sales.

Final Note

It's crucial to understand that these suggestions should be viewed as a general guide and may not be entirely precise. Market conditions can fluctuate quickly and unexpectedly, which can impact the success of these strategies.