Profit Optimization through Data-Driven Analysis for Business Development and Understand Cycle shop trend Shop:Usman Cycle Works

A Final Term Report For The BDM Capstone Project

Submitted by Name : Taniya Chouhan
Roll number : 23f2003584

IITM Online BS Degree Program,
Indian Institute of Technology, Madras, Chennai
Tamil Nadu, India, 600036.

CONTENTS

EXECUTIVE SUMMARY

This analysis evaluates the performance of Usman Cycle Works, owned by Mr. Mahboob Ali, based on sales and purchase data from April 2024 to July 2024. shop selling bicycles, tyres, tubes, and accessories from brands like Avon, Hero, Aqua, Holland, and Honda, and is currently facing challenges including declining profits, inventory inefficiencies, and limited customer insights, driven by rising expenses, shifting consumer preferences, and post-lockdown disruptions.

The objective was to assess financial performance, inventory efficiency, customer behavior, and item profitability. Data was cleaned and standardized, with key metrics like Net Stock Change, Stock-to-Sale Ratio, and Excess Stock Percentage used to evaluate inventory. Profitability was measured by the difference between selling and purchase prices. Monthly SKU-level data and visualizations (via Python and Excel) highlighted sales trends and inefficiencies.

From April to July, the shop shifted from overstocking to better inventory turnover. However, cycle stock outs revealed misaligned purchasing. Sales peaked in June without new purchases, underscoring the need for improved demand forecasting. The majority of revenue comes from cash transactions, contributing over ₹640,000 far exceeding individual customer contributions. This highlights a heavy reliance on anonymous sales, suggesting a need to promote account-based transactions for better tracking and customer relationship management.

Cycles in the low (≤ ₹4,000) and mid-range (₹4,001–₹8,000) segments showed strong demand and profitability. In contrast, accessories and tyres were overstocked and had low margins. Cycles were the main profit driver (₹64,593), while tyres posted losses and accessories offered modest gains. This reliance on cycles highlights the need to diversify revenue by promoting higher-margin products such as tubes and accessories taxed at 18% GST.

Recommendations include adopting data-driven inventory planning, launching loyalty programs to boost customer retention, and prioritizing high-margin products such as premium cycles and 18% GST accessories to drive long-term growth and profitability.

Detailed Explanation of Analysis Process/Method

The objective of this analysis is to identify and understand the issues and trends in sales, purchase and profitability and aim to provide data driven recommendations for improvement. After talking about the problems I have collected data about sales and purchase for 4 months (April 2024, May 2024, June 2024, July 2024). I have cleaned the data, verified the data consistency, removed the duplicates in the data. They had provided me with the purchase data for 4 months. They hadn’t purchased every item monthly. For the convenience

of calculation and understanding, I have organized the data month wise and entered the purchase details for the items in the particular month.

To perform analysis and get insights , I have calculated gross profit, Total Sales ₹, Total Purchases ₹, Total Purchase Quantity according to month, Total Sales Quantity according to month, Net Stock Change, Stock to sale ratio, Excess Stock Percentage. I have used excel sheets and python colab for calculations and charts.

To analyze the inventory behavior over the months, I calculated the Net Stock Change for each month by subtracting the quantity sold from the quantity purchased for every month. The formula I used is:

$$Net\ Stock\ Change = Purchase\ Quantity - Sales\ Quantity$$

This calculation helped me understand whether the shop was overstocking or understocking items each month. A positive value indicates that the owner purchased more than sold (leading to a stock increase), while a negative value means sold more than purchased (resulting in a stock decrease or potential shortage).

To assess how efficiently the shop was managing its inventory in relation to actual sales, I calculated the Stock-to-Sale Ratio for each month. This metric helps evaluate whether the shop was purchasing an appropriate amount of stock compared to what was being sold. The formula I used is:

$$Stock\ to\ Sale\ Ratio = Purchase\ Quantity\ /\ Sales\ Quantity$$

In this context:

- Purchase Quantity represents the total number of units the shop acquired in a given month.
- Sales Quantity refers to the number of units the shop sold during the same period.

This ratio serves as a key indicator of inventory efficiency. A higher stock-to-sale ratio suggests that the shop is purchasing much more than it is selling, which could lead to overstock, increased holding costs, or even inventory wastage. Conversely, a lower ratio indicates that sales are relatively high compared to purchases, which may imply either efficient inventory turnover or a risk of stockouts if not carefully monitored.

By applying this method to monthly data, I was able to gain insights into the shop's stock control practices and identify potential issues with overstocking or understocking, which can significantly impact operational and financial performance.

To further assess the efficiency of the shop's inventory management, I calculated the Excess Stock Percentage for each month. This metric helped quantify how much stock remained

unsold relative to the volume of purchases, providing a clearer picture of overstocking or understocking tendencies.

The formula I used is:

$$Excess\ Stock\ Percentage = (Net\ Stock\ Change - Purchase\ Quantity) * 100$$

Where:

- Net Stock Change is the difference between purchase quantity and sales quantity for the month. It shows how much stock was left unsold or how much was drawn from previous inventory.
- Purchase Quantity is the total number of units the shop procured during the month.

A positive percentage indicates that a portion of the purchased stock remained unsold, signaling potential overstocking. A higher percentage reflects greater inefficiency in aligning supply with demand. On the other hand, a negative percentage means that the shop sold more than it purchased in that month, suggesting stock was either carried over from previous months or that there was a shortage.

This calculation allowed me to interpret the shop's purchasing decisions in relation to actual sales performance and to identify whether stock levels were aligned with customer demand.

To evaluate the financial performance of the shop across different months, I calculated the Profit. This metric reflects the basic profitability of the shop before accounting for operational expenses, and it serves as a primary indicator of how effectively the shop is buying and selling its goods.The formula I used is:

$$Profit\ per\ item = (Weighted\ Average\ Selling\ Price - Weighted\ Average\ Purchasing\ Price) \times \text{Total Quantity sold per item}$$

Where:

Total Selling Amount = Selling Price per item×Quantity Sold per item

Total Purchasing Amount = Cost Price per item× Quantity Purchased per item

Weighted Average Selling Price =∑(Total Selling Amount) / ∑(Quantity Sold per item)

Weighted Average Purchasing Price=∑(Total Purchasing Amount) / ∑(Quantity Purchased per item)

This approach allowed me to see whether the shop was generating profit directly from its core buying and selling activities. A positive gross profit indicates that the shop sold goods for more than it paid to acquire them, suggesting a healthy markup. A negative gross profit, on the other hand, reveals that the shop spent more on purchasing stock than it earned

through sales, which may point to issues such as overpricing by suppliers, discounting during sales, or poor sales performance.

By applying this method monthly, I was able to monitor trends and identify periods of loss or gain, offering insights into the shop's cost control and pricing strategy

Use of SKU Method : To ensure that the analysis was both unbiased and highly accurate, I adopted the Stock Keeping Unit (SKU) method throughout the process. By treating each product variant as a unique SKU, I was able to analyze the performance, inventory movement, and profitability of individual items rather than relying on generalized product categories. This method allowed me to track how each specific item was purchased, stocked, and sold over the months, leading to a much more granular and insightful understanding of the shop's operations. It also helped identify which specific items were overstocked, understocked, or contributing the most to profit or loss. Additionally, using SKU-based tracking ensured that trends in consumer demand, inventory inefficiencies, and pricing performance could be evaluated at a product-specific level, which is essential for making informed, data-driven decisions. This level of detail is especially important for small- to mid-sized retail businesses where individual items can vary widely in terms of cost, demand, and turnover rate.

To effectively analyze and present the shop's financial and inventory performance, I used various Python libraries to create a range of visualizations. These helped me uncover hidden patterns, monitor trends over time, and highlight key issues more clearly than raw data alone could.

The core libraries I used were:

- Pandas: For organizing, grouping, and transforming the data into a usable format for plotting.
- Matplotlib: To build foundational charts such as pie charts, bar graphs, and line graphs.
- Seaborn: For advanced and visually appealing plots like heatmaps and stacked graphs.

Here's how I applied each chart type in the analysis:

Bar Charts:- I used bar charts to compare figures such as Remaining Stock by Product, Top 10 Customers by Revenue, Total Quantity Sold by Price Category for Cycle, Monthly Purchase Quantity per Item April 2024 to July 2024, Profit per Unit by Product and Total Profit by Product across different months. These helped illustrate which months were most profitable, where inventory challenges occurred, which product was overstocked or understock and customer insights.

Line Charts:- Line charts were used to visualize daily sales trends over time, specifically capturing fluctuations in total sales (₹) across the four-month period from April 2024 to July 2024. This visualization helped identify patterns in customer purchasing behavior, spikes in

revenue, and periods of low sales activity. By plotting sales data on a continuous timeline, the chart made it easier to detect growth patterns, potential seasonal effects, and inconsistencies in daily performance, offering valuable insights for demand forecasting and sales strategy improvement.

Stacked Bar Charts:-To compare multiple metrics simultaneously such as Net Stock Change and Sales Quantity for each month I used stacked bar charts. These visualizations helped in understanding the relative contribution of each component to the overall monthly activity, making it easier to detect imbalances in inventory operations and sales performance.

Pie Charts**:**-To visualize the proportionate contribution of each item to the overall profit, I employed pie charts. These visualizations made it easy to assess which products were the main drivers of profitability and which ones contributed less or potentially dragged down the shop's financial performance. By highlighting the dominant and underperforming items, pie charts supported strategic decision-making regarding inventory focus and sales priorities.

Heatmaps:- I used heatmaps to identify intensity and concentration of values like stock-to-sale ratios or excess stock percentages. This visual helped in quickly locating performance outliers and operational inefficiencies across months or product categories.

Datasets:https://drive.google.com/drive/folders/1LflSN4YpeSaOVTjfamq1O4IWq5pyec9a?usp=sharing
Colab:https://colab.research.google.com/drive/11Y-XnoMCmA7B8w6Xotgxjqw0LrxVDJGY?usp=sharing

RESULTS AND FINDINGS

1. Stock Management

Figure 3.1.1 presents a Stacked Bar Chart illustrating the Net Stock Change versus Sales Quantity from April 2024 to July 2024, effectively highlighting the evolving inventory and sales dynamics over this period. In April, there was a significant stock build-up with a net stock change of approximately 1,950 units, while sales were minimal, suggesting an unusually high stock-to-sales ratio and excess inventory. In May, inventory additions dropped sharply to around 480 units, while sales showed a slight uptick, contributing more noticeably to the total stock movement. June saw a further decline in net stock change to about 260 units, alongside a sharp increase in sales, indicating a more balanced flow between incoming stock and outgoing sales. By July, there was virtually no inventory added, and only sales (around 80 units) were recorded, implying that stock was being drawn from existing inventory. This likely contributed to the negative excess stock percentage observed previously. Overall, the chart complements other stock efficiency indicators by revealing how the initial overstocking in April was gradually offset by rising sales and reduced inventory intake, culminating in July's depletion without replenishment. This trend underscores the

importance of aligning stock planning with actual sales performance to avoid both overstock and potential stockouts.

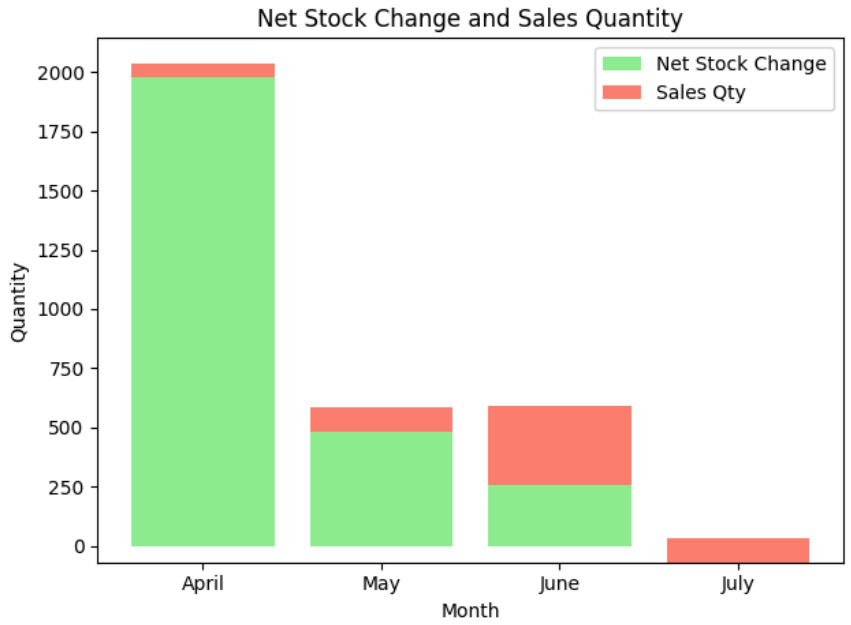

Figure 3.1.1 Net Stock Change and Sales Quantity from April 2024 to July 2024

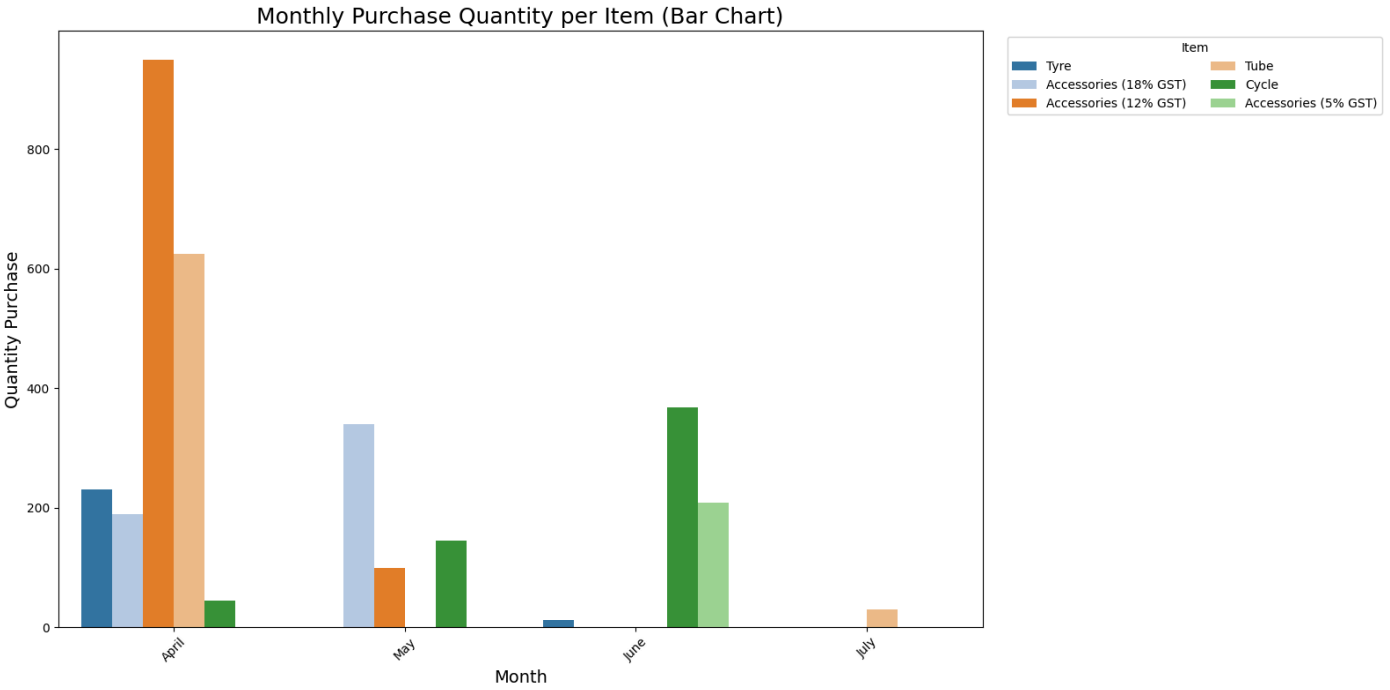

Figure 3.1.2 Monthly Purchase Quantity per Item April 2024 to July 2024

The bar chart Figure 3.1.2 displays item-wise purchase trends from April 2024 to July 2024. A clear spike in purchases is observed in April 2024, with "Accessories (12% GST)" and "Tube" accounting for the highest volumes indicating significant stock buildup at the

beginning of the period. "Tyre" and "Accessories (18% GST)" also saw moderate purchases in April, whereas "Cycle" and "Accessories (5% GST)" were minimal. In May, purchasing activity declined across most categories, with "Accessories (18% GST)" leading, followed by "Cycle" and a small volume of "Accessories (12% GST)." Tyre and Tube purchases were negligible. In June, the focus shifted to "Cycle" and "Accessories (5% GST)," both showing strong purchasing activity, while all other items, including high-GST accessories and tyres, recorded little to no purchases. By July, purchases had nearly halted across all categories, with only a small quantity of "Tube" acquired. These trends suggest a bulk procurement strategy in April, followed by tapering purchase volumes in subsequent months, possibly to align with rising sales and reduce excess inventory. The shift in purchasing patterns across item categories also highlights evolving product demand and could inform more efficient future stocking decisions.

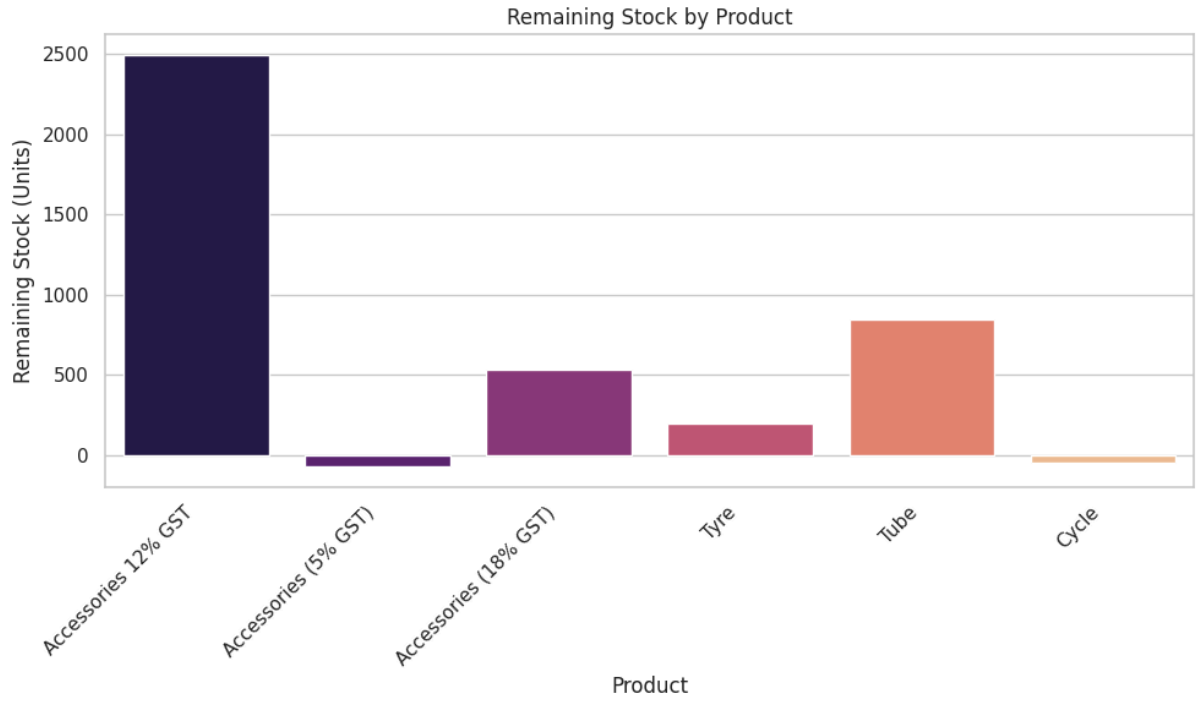

Figure 3.1.3 Remaining Stock by Product

The analysis of Figure 3.1.3 indicates notable disparities in stock management across different product categories. "Accessories (12% GST)" exhibit an excessively high remaining stock, with nearly 2,500 units unsold, pointing to significant overstocking and potential inefficiencies in demand forecasting or purchasing strategy. On the other hand, "Accessories (5% GST)" and "Cycle" categories are showing negative stock levels, which likely reflect that in between April 2024 to July 2024 the more quantity of cycle and Accessories (5% GST) sold than purchase."Accessories (18% GST)" and "Tyre" demonstrate a relatively balanced stock position, with moderate remaining inventory suggesting a more aligned flow between procurement and sales. Meanwhile, the "Tube" category, although holding a considerable surplus of around 850 units, still shows better stock turnover compared to the surplus levels of "Accessories (12% GST)." These findings underscore the need for improved

inventory controls, accurate stock reporting, and more adaptive stock planning strategies tailored to actual sales trends.

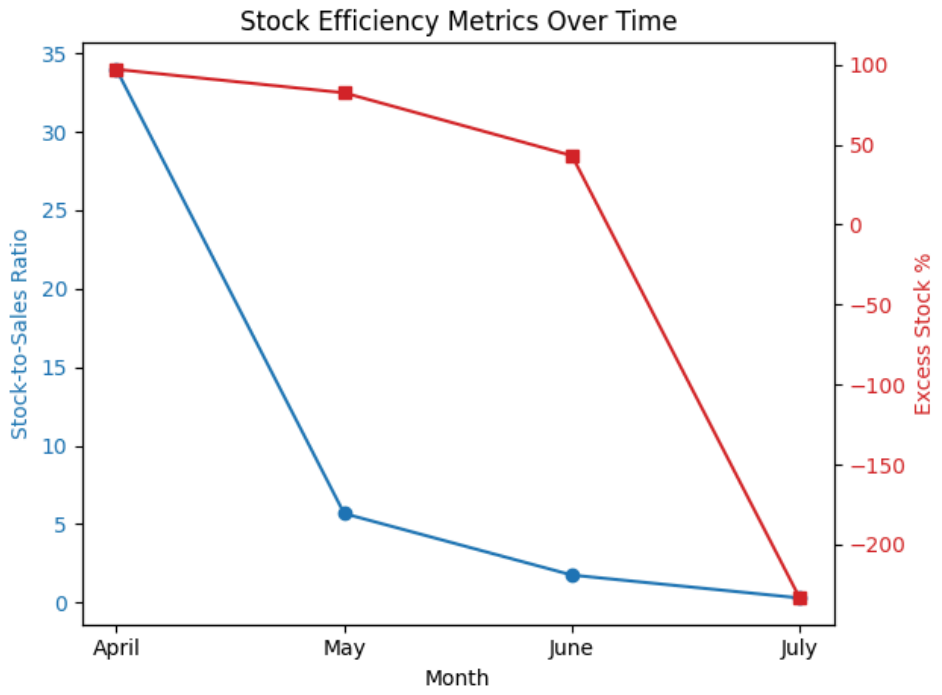

Figure 3.1.4 Stock Efficiency Metrics Over Time

The chart Figure 3.1.4 "Stock Efficiency Metrics Over Time" presents a dual-axis analysis of Stock-to-Sales Ratio (left y-axis, in blue) and Excess Stock Percentage (right y-axis, in red) from April 2024 to July 2024. The Stock-to-Sales Ratio started extremely high in April, indicating a substantial amount of unsold stock compared to sales. However, this value declined sharply in May 2024 and continued to drop through June 2024 and July 2024, reaching close to zero suggesting improved inventory turnover or possibly stock depletion. Meanwhile, the Excess Stock Percentage also shows a consistent decline, with values moving from a high surplus in April 2024 to a significant negative percentage in July 2024, implying stock shortages or over-dependence on fast-moving inventory. This trend reveals that while stock management improved in terms of reducing excess, it may have overshot, leading to understocking or unmet demand. Overall, the analysis highlights a transition from overstocking to a lean inventory model, though it also raises a potential concern about whether the stock levels are now too low to meet customer needs effectively.

The bar chart Figure 3.1.5 visually compares the quantities of purchases and sales across four months: April 2024, May 2024, June 2024, and July 2024.

- In April 2024, the purchase quantity was extremely high (over 2000 units), while the sales quantity was quite low (around 60 units). This suggests bulk procurement possibly in preparation for future demand.

- In May 2024, both purchase and sales quantities increased slightly, with purchases still significantly higher than sales.
- In June 2024, sales saw a notable jump (approximately 330 units), nearly matching the purchase quantity, which remains steady. This could indicate peak sales season or successful marketing efforts.
- By July 2024, both sales and purchases dropped sharply, with sales exceeding purchases. This may reflect the use of stock purchased earlier or a seasonal decline in both activities.

Overall, the data reflects a seasonal trend where large stock is procured early (April 2024), followed by increased sales mid-year (June 2024), and a slowdown by July 2024.

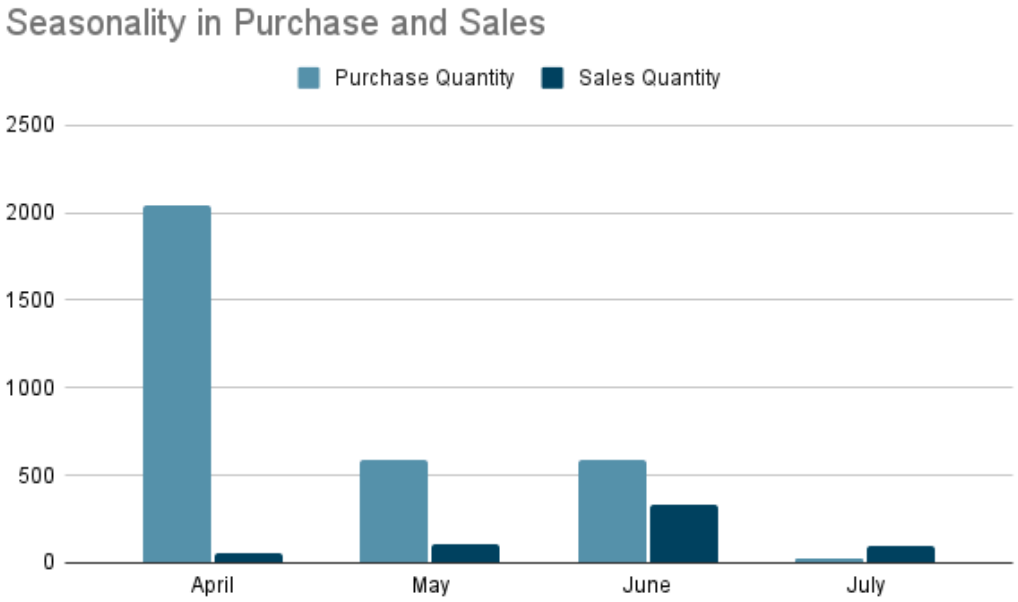

Figure 3.1.5 Seasonality in Purchase and Sales

2. Customer Insights

The bar graph titled "Top 10 Customers by Revenue" reveals a significant skew in revenue distribution, with the majority of income coming from cash transactions. The category labeled "Cash" generates over ₹640,000, dwarfing the contributions from all other customers. This dominance suggests that most sales are being made to walk-in customers or those not registered under individual accounts. The remaining top customers including Lalit Sharma, Hari Ram, Rakesh Ji, Aarif, and others each contribute between ₹20,000 and ₹40,000, indicating that while there are some repeat or high-value individual buyers, their impact on overall revenue is minimal compared to cash sales. This trend raises potential issues related to accounting transparency and customer tracking, as excessive reliance on cash sales may hinder efforts to build strong customer relationships or implement loyalty programs. Moving

forward, encouraging more account-based sales could help the business gain better insights into customer behavior and improve long-term retention and growth strategies.

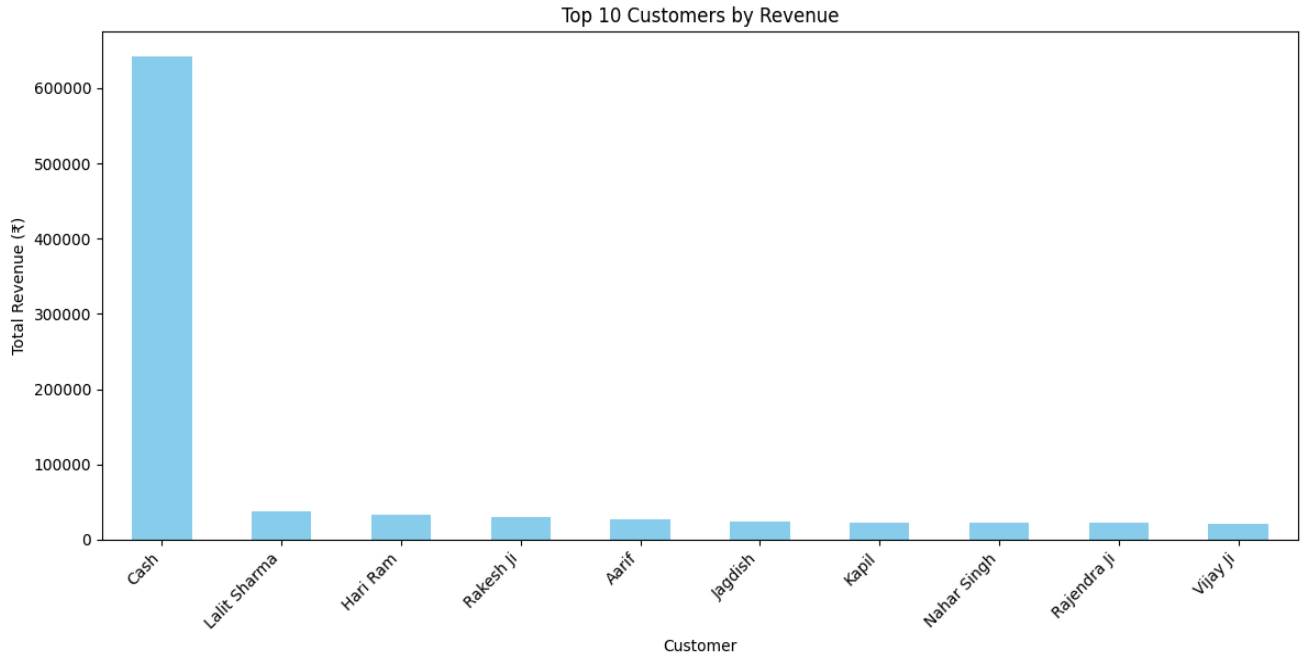

Figure 3.2.1 Top 10 Customers by Revenue

The line graph Figure 3.2.2 "Monthly Sales Trend" illustrates the daily total sales (₹) over a four-month period from April 2024 to July 2024. From the visual, several key trends and findings emerge: There is a clear fluctuation in daily sales throughout the entire period, with both high peaks and sharp drops, indicating that the shop experiences inconsistent customer demand or varying sales volumes across days. In April 2024, sales began at relatively moderate levels, followed by noticeable volatility some days recording low sales (below ₹5,000), while others spiked above ₹25,000. May 2024 displays a significant spike around mid-month, reaching the highest observed sales value of approximately ₹45,000. This suggests a possible promotional event, bulk purchase, or seasonal demand surge during that time. June 2024 shows comparatively more stable sales, although minor ups and downs persist. The pattern suggests a slight increase in sales consistency, with most values clustered between ₹10,000 and ₹20,000. However, towards July 2024, the graph again shows increased volatility. Several days in July experienced sharp peaks exceeding ₹30,000, followed by steep declines, possibly indicating that customer footfall or purchasing behavior was influenced by specific days, events, or stock availability. Overall, the sales trend indicates that while there are periods of high performance, the shop also faces irregularities and dips in sales, possibly due to inconsistent demand, poor inventory alignment, or external factors such as seasonality or marketing efforts. The analysis emphasizes the need for better demand forecasting, inventory planning, and promotional strategies to stabilize daily revenue and maximize profitability across all months.

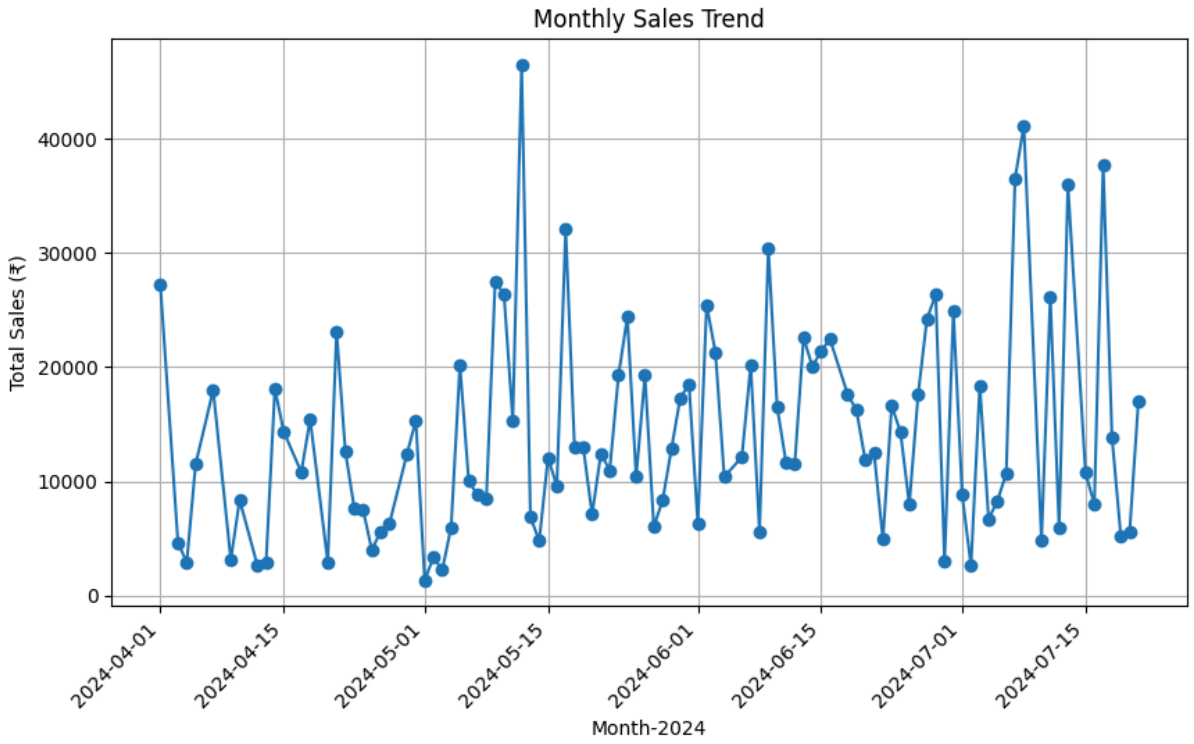

Figure 3.2.2 Monthly Sales Trend from April 2024 to July 2024

The bar graph Figure 3.2.3 "Total Quantity Sold by Price Category for Cycle" illustrates how cycle sales are distributed across three price categories: Cheap (≤ ₹4000), Medium (₹4001–₹8000), and Expensive (₹8001–₹12000). The y-axis represents the quantity sold, while the x-axis categorizes the cycles based on their price range. From the graph, observe that the "Cheap" category dominates sales, with close to 190 units sold, making it the most popular price range among customers.

This suggests that affordability is a key factor influencing purchasing decisions in the cycle market being analyzed. The "Medium" price range also sees substantial sales, with around 155 units sold, indicating a secondary but significant customer segment that is willing to invest in better-quality cycles within a moderate budget. In stark contrast, the "Expensive" category (₹8001–₹12000) has notably low sales, fewer than 20 units highlighting limited demand for high-end cycles. This disparity strongly implies that the majority of customers are price-sensitive, with demand sharply declining as prices increase.

Overall, the data suggests that to maximize volume, the business should focus on stocking and marketing cycles within the low to medium price range. However, if profitability is prioritized, the company might still explore premium offerings with higher margins, albeit with lower turnover. Balancing inventory according to these demand patterns could optimize both sales volume and profit potential.

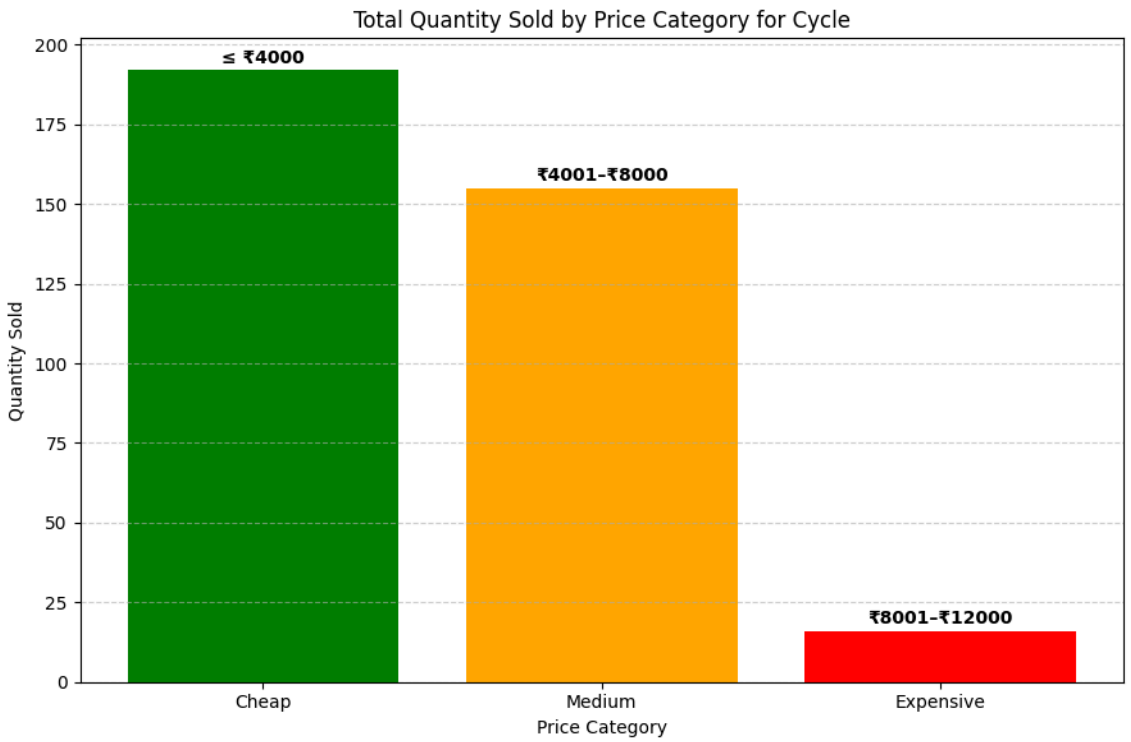

Figure 3.2.3 Total Quantity Sold by Price Category for Cycle

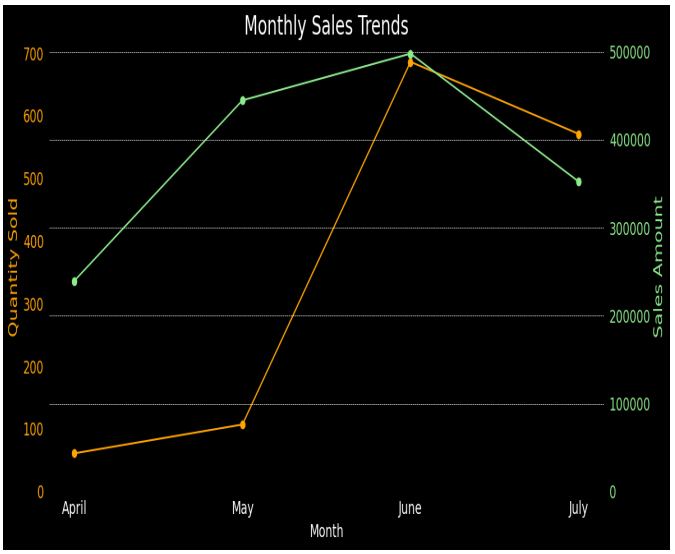

Figure 3.2.4 Monthly Sales Trends

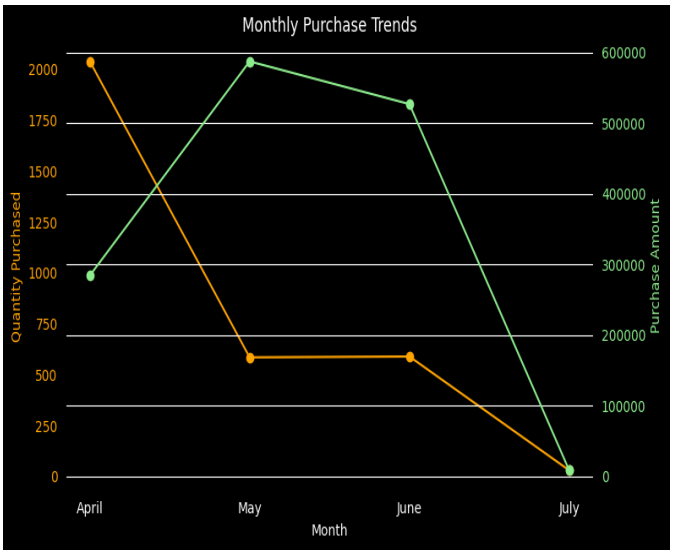

Figure 3.2.5 Monthly Purchase Trends

Combining the insights from both the purchase (Figure 3.2.5) and sales (Figure 3.2.4) trends graphs provides a comprehensive understanding of customer behavior and the shop's operational efficiency, making this analysis highly valuable for customer insights. The purchase trend reveals that the shop made significant purchases in April 2024, stocking up with the expectation of strong customer demand. However, sales during that month were low, indicating either a misjudgment of demand timing or that customers were not yet ready to buy, possibly due to seasonal patterns, pricing, or product-market mismatch. In May 2024,

the shop reduced the quantity purchased but spent more per item, suggesting a shift in purchasing strategy toward higher-value goods yet customer response remained modest. The most significant insight comes in June 2024, where a peak in both quantity sold and sales revenue occurred without a corresponding increase in purchase volume. This indicates that customer demand surged, possibly due to marketing efforts, seasonal demand, or product relevance, and that the shop was able to meet this demand using the inventory stocked in previous months. July 2024 continued this positive sales trend despite zero purchases, confirming that the inventory planning in earlier months enabled sustained customer satisfaction without restocking.

From a customer insight perspective, these patterns highlight that customers respond more strongly in mid-year months, and that product demand does not always align immediately with stock availability. This emphasizes the importance of aligning inventory purchases with actual customer purchasing behavior, forecasting demand accurately, and using historical data to anticipate peak months. It also reveals that purchasing high quantities early on doesn't guarantee immediate sales and can tie up capital. In contrast, the ability to maintain strong sales without new purchases reflects efficient inventory use and a clear understanding of customer preferences. Overall, these insights can help the shop tailor its inventory, pricing, and promotional strategies to better align with customer behavior, reduce waste, and improve profitability.

3. Profit Trends

Figure 3.3.1 Correlation Heatmap

The correlation heatmap Figure 3.3.1 provides valuable insights into the relationships among key business metrics such as purchase quantity, sales quantity, stock changes, sales amount,

purchase amount, and profit. A very strong positive correlation (0.99) between purchase quantity and net stock change indicates that most of the purchased items contribute directly to stock levels. On the other hand, sales quantity correlates strongly with sales amount (0.71), confirming that increased sales volume boosts revenue. Interestingly, sales amount also shows a strong positive correlation with purchase amount (0.75), suggesting that higher sales may require proportionally higher investments in purchasing.

However, the most significant observation is the strong negative correlation between purchase amount and profit (−0.94), implying that high procurement costs substantially reduce profitability. This is further supported by the negative correlation between purchase quantity and profit (−0.46), highlighting the potential issue of overstocking or inefficient purchasing strategies. Similarly, net stock change has a moderate negative correlation with profit (−0.41), indicating that simply increasing inventory does not improve profit and might actually hurt it if items remain unsold. Sales quantity shows a weak negative correlation with profit (−0.22), suggesting that sales alone are not sufficient to drive profitability without effective cost control. Overall, these results emphasize the importance of balancing procurement with actual demand and focusing on cost management to enhance profitability.

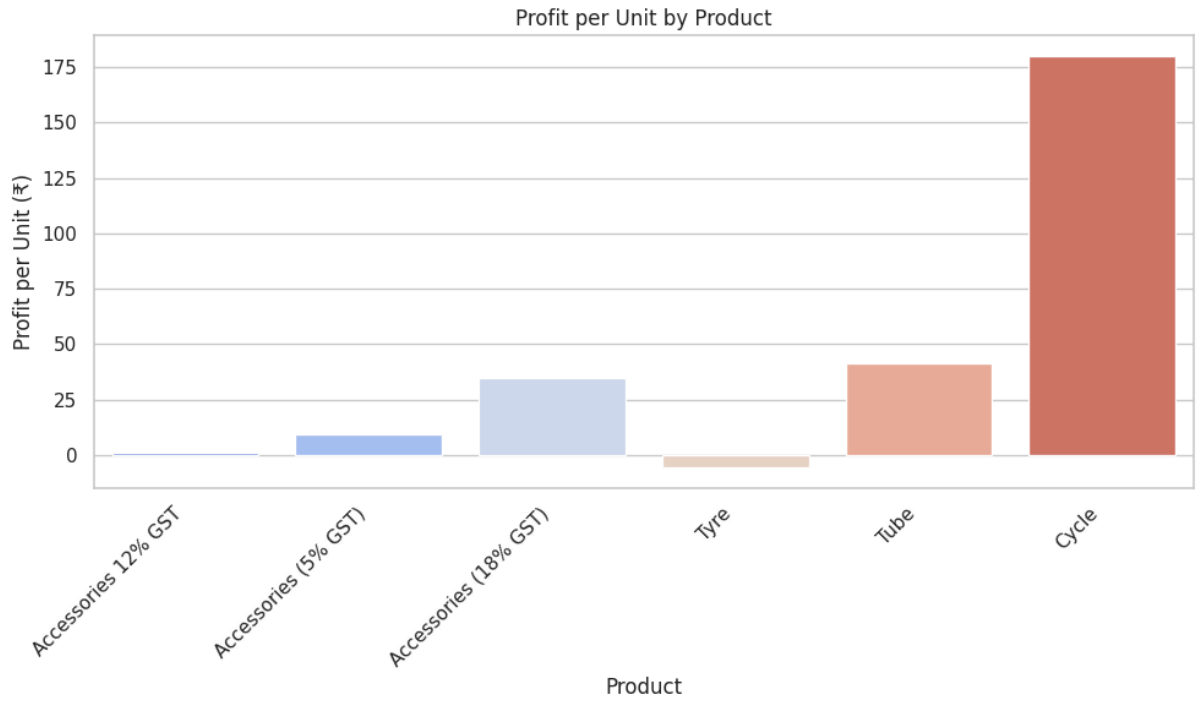

Figure 3.3.2 Profit per Unit by Product

The bar chart Figure 3.3.2 illustrating Profit per Unit by Product provides valuable insights into the efficiency and margin strength of individual product categories. Among all products, Cycles clearly outperforms, delivering an impressive average profit of over ₹180 per unit, which not only reinforces their dominance in total profit but also highlights their efficiency at the unit level. Tubes, with a per-unit profit of approximately ₹40, and Accessories taxed at

18% GST, earning around ₹33 per unit, also demonstrate healthy margins, suggesting they could become more impactful if sales volumes are increased. On the other hand, Accessories with 5% GST offer modest profitability (~₹10 per unit), while Accessories with 12% GST tend to break even or yield minimal returns. Most concerning is the performance of Tyres, which show negative profit per unit, indicating that the business incurs a loss on each tyre sold. These figures imply that while cycles remain the most effective in terms of both volume and unit profit, there is potential to improve overall profitability by focusing on scaling the sales of higher-margin accessories and tubes. Additionally, underperforming categories such as tyres warrant immediate cost analysis and pricing revision to mitigate losses and restore profitability.

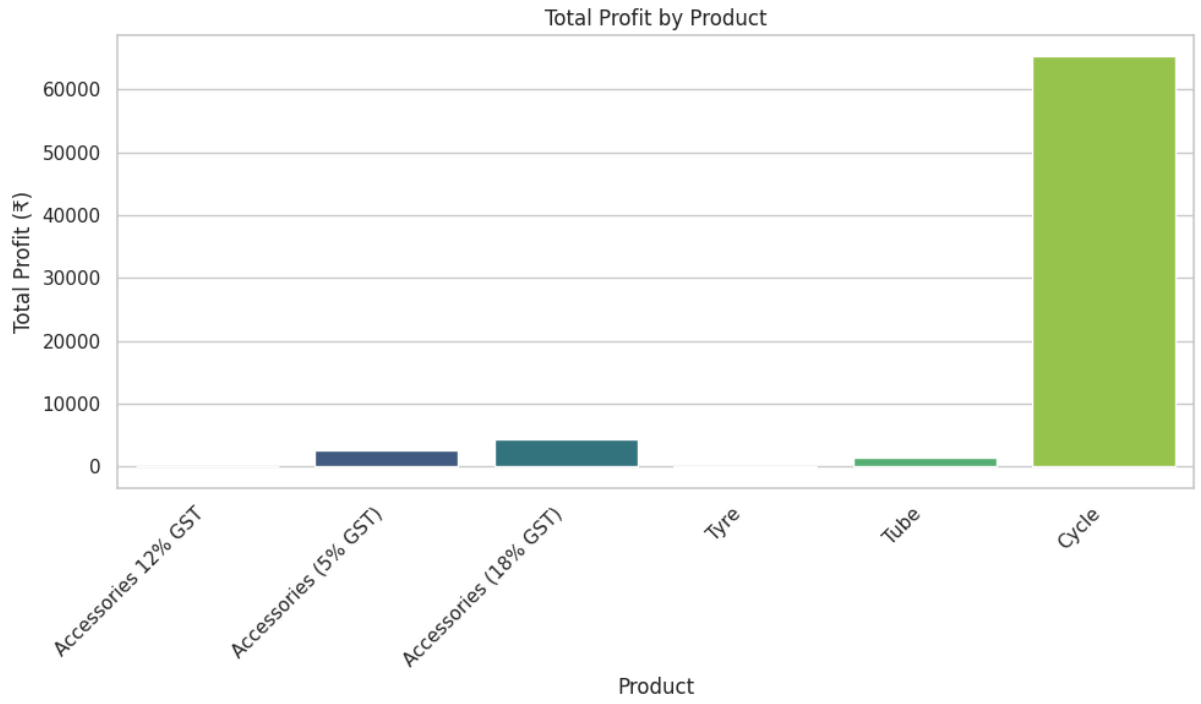

Figure 3.3.3 Total Profit by Product

Figures 3.3.3 (Total Profit by Product) and 3.3.4 (Profit Contribution by Product) together provide a comprehensive view of the profitability distribution across the various product categories. The data clearly illustrates that Cycles are the primary revenue and profit-generating segment of the business. With a total profit of approximately ₹64,593, they represent about 89% of the total profit earned during the analysis period. This significant contribution reflects both strong sales volumes and favorable per-unit profit margins, making cycles the financial backbone of the company's product portfolio.

In contrast, other product categories such as Accessories with 18% GST and Accessories with 5% GST make comparatively smaller contributions, with profits of approximately ₹4,255 (5.8%) and ₹2,625 (3.5%) respectively. These figures, while modest, still indicate meaningful potential especially for the 18% GST category, which likely benefits from higher unit prices

or better margins. Tubes contribute a smaller profit of about ₹1,280, corresponding to 1.8% of the total profit, which, although limited, still supports product diversity and incremental gains.

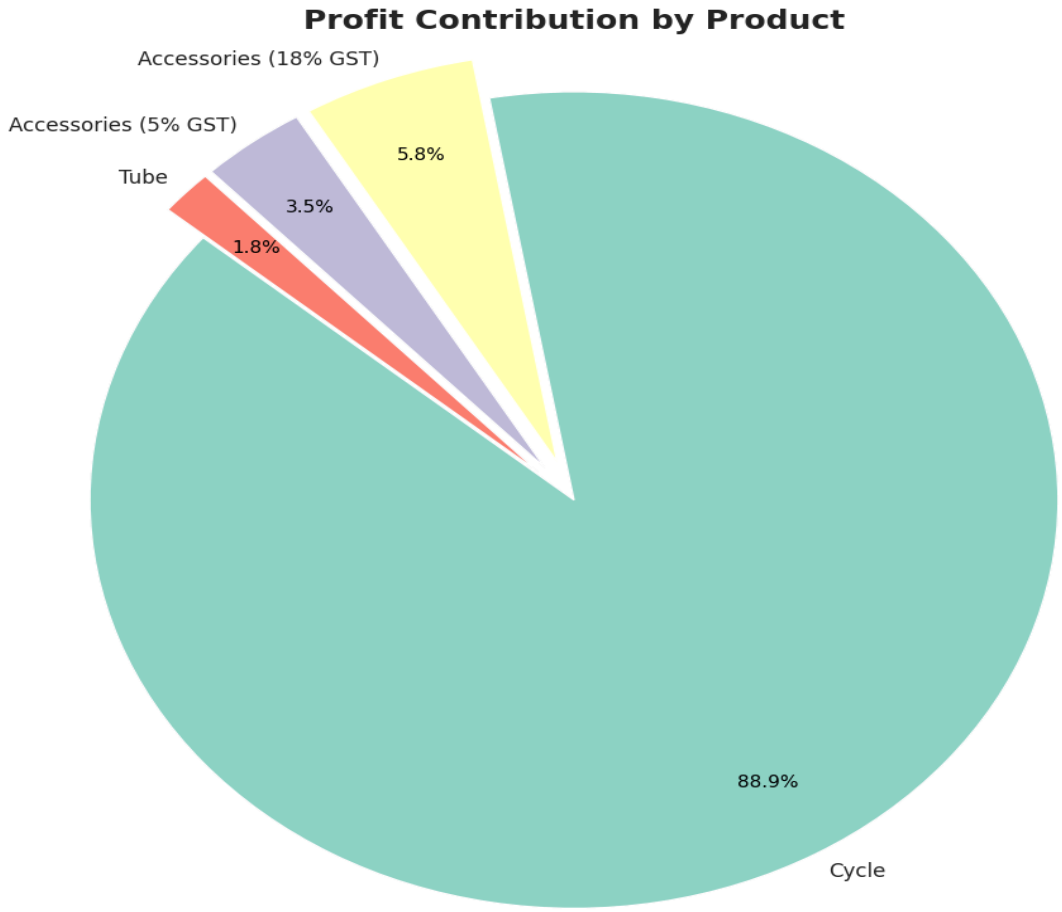

Figure 3.3.4 Profit Contribution by Product

Meanwhile, the remaining categories particularly Tyres and Accessories taxed at 12% GST show negligible or even negative profits. This could be due to a combination of factors such as low sales volumes, high cost of goods sold, poor pricing strategies, or insufficient market demand. These categories may require further evaluation to determine if continued stocking is justified or if changes in pricing, sourcing, or promotion are necessary.

The pie chart in Figure 3.3.4 reinforces these findings by visually emphasizing the heavy concentration of profit in the cycle category. While this dominance underscores the importance of cycles to the overall financial health of the business, it also exposes a potential vulnerability and over-reliance on a single product type. Any disruption in cycle sales due to

market shifts, supply chain issues, or changing consumer preferences could significantly impact overall profitability.

Therefore, while the cycle category should continue to be supported and optimized, there is a strategic need to strengthen the performance of accessory and tube segments. These categories, particularly those with higher GST rates and better per-unit margins, offer opportunities for growth. With appropriate marketing strategies, bundling options, and possibly revised pricing, these products could enhance their contribution to total profits and reduce dependency on cycles.

INTERPRETATIONS OF RESULTS AND RECOMMENDATIONS

The Usman Cycle Works have been there for many years and Mr. Mahboob Ali has implemented different things to improve the business. Here are the key insights and recommendations for further enhancement.

Based on the detailed analysis of the shop's purchase and sales data from April 2024 to July 2024, I observed several key insights regarding stock management, profitability, and Customer Insights.

INTERPRETATIONS OF RESULTS

Stock Management:- The analysis shows a clear mismatch between stock procurement and actual sales demand. Early months incurred high inventory holding costs due to overstocking, while by June 2024, stock shortages led to missed sales opportunities. The absence of replenishment in July 2024 suggests supply chain issues or a planned drawdown. A decline in tyre, tube, and 12%-18% GST accessory sales after April points to seasonal trends or poor stock alignment with customer preferences. The business did not adjust inventory to reflect a shift in demand towards cycles and low-GST accessories. Negative stock for Accessories (5% GST) and Cycles signals inventory record-keeping errors, possibly from inaccurate entries, untracked damage, or theft. Overstocked slow-moving products highlight poor demand forecasting and tie up working capital, increasing the risk of obsolescence.

Customer Insights:- The business relies heavily on one-time walk-in cash buyers, indicating a transactional model with minimal repeat customers. This exposes the business to risk if walk-in sales decline due to seasonality, market shifts, or economic conditions. Revenue peaked in May 2024 and June 2024, likely driven by promotions or seasonal demand, but fell sharply in July 2024, possibly due to ineffective marketing, stock shortages, or external factors. Building long-term customer relationships and diversifying the customer base are essential for revenue stability.

Profit:- Cycles are the most profitable product and are central to the company’s financial health. In contrast, tyres are consistently sold at a loss, and 12% GST accessories contribute

little to overall profit. Tubes and other accessories provide modest returns. Despite significant inventory in low-margin categories, their impact on profit is minimal, suggesting misallocated resources. Over-reliance on cycle sales makes the company vulnerable if this category underperforms.

RECOMMENDATIONS

To enhance business performance, a multi-pronged strategy focusing on stock management, customer engagement, and profitability is essential. Inventory planning should be demand-driven, leveraging real-time sales data and forecasting tools to ensure stock levels match customer needs.

Stock Management:- Adopt demand-driven inventory planning using real-time sales data and forecasting tools. Adjust procurement monthly based on trends, especially for high-demand items like cycles. Set reorder points and maintain safety stock to avoid shortages. Conduct regular audits, enforce SOPs, and resolve negative stock entries. Use promotions, discounts, or bundling to clear slow-moving items. Implement dashboards and customer feedback tools to refine inventory decisions.

Customer Insights:- Develop loyalty programs, register customers at the point of sale, and offer personalized promotions to encourage repeat business. Identify and engage high-potential customers through targeted outreach. Explore bulk sales with institutions to reduce reliance on walk-ins. Understand seasonal sales patterns through past data and feedback to inform promotions. Add services like repairs or maintenance to increase customer retention and recurring revenue.

Profit:- Focus marketing and sales on cycles, offering add-ons or premium versions to improve margins. Review pricing and sourcing strategies for tyres and consider discontinuation if unviable. Reposition low-margin accessories through bundling or adjusted pricing. Support moderately profitable products with volume-based strategies. Regularly review margins and renegotiate supplier terms to ensure efficient resource allocation and sustained profitability.

Product-wise Recommendation :-

1. Cycle

- Sales Trend: Majority of cycles sold are in the cheap (≤ ₹4000) and medium (₹4001–₹8000) price categories, with minimal sales in the expensive category.
- Remaining Stock: Very low or even negative remaining stock, indicating high demand and potentially stockout issues.
- Profitability:
    - Total Profit: Highest among all products.
    - Profit per Unit: Also the highest.
- Recommendation:

    - Focus on restocking and expanding inventory for the cheap and medium categories.
    - Consider promotional strategies or discounts for expensive models to boost sales.
    - Maintain cycle sales as a core revenue driver.

2. Accessories (12% GST)

- Remaining Stock: Extremely high, indicating poor sales or overstocking.
- Profitability: Negligible total and per-unit profit.
- Recommendation:
    - Reassess whether these accessories are relevant to customer needs.
    - Consider discounts or bundling to clear stock.
    - Reduce future purchases until current inventory is cleared.

3. Accessories (5% & 18% GST)

- Remaining Stock: Moderate for 18% GST, very low (possibly negative) for 5% GST.
- Profitability: Moderate profits, especially from the 18% GST category.
- Recommendation:
    - Continue stocking Accessories (18% GST) as they provide decent returns.
    - Maintain stock levels for 5% GST accessories based on demand.
    - Analyze customer preferences to align GST categories with product types.

4. Tyre

- Remaining Stock: Moderate.
- Profitability:
    - Negative profit per unit and minimal total profit, indicating losses.
- Recommendation:
    - Investigate sourcing or pricing issues.
    - Avoid bulk restocking.
    - Consider revising price or improving quality/marketing to increase value perception

5. Tube

- Remaining Stock: Substantial remaining stock.
- Profitability:
    - Positive profit per unit and moderate total profit.
- Recommendation:
    - Focus on inventory management to avoid overstocking.
    - Consider promotional campaigns to increase turnover while retaining profit margin.