Refining the inventory Management for Effective functioning in Agrochemical.

A FINAL SUBMISSION REPORT FO BDM CAPSTONE PROJECT

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CONTENTS

1: EXECUTIVE SUMMARY

This report presents a comprehensive examination and detailed analysis of information gathered from **Shri Ganesh Fertilizer,** an Agro chemicals store situated in Jind, Haryana. This entity operates within the domain of **B2C** markets, specializing in a diverse array of agrochemical products, ranging from insecticides and fungicides to herbicides and plant nutrients, a thorough analysis of organizational data encompassing sales metrics and profit and loss statements from April to June 2023. Despite initial data limitations strategic adjustments were implemented to derive actionable insights.

The analysis used a comprehensive approach to evaluate sales, profit, and operational efficiency. Revenue analysis examined monthly, weekly, and daily sales data to identify trends, while cluster formation analysis grouped companies for comparative evaluations. Profit analysis calculated margins and trends, supported by pivot tables and charts for clear visualization. This method revealed crucial insights into performance and highlighted areas needing improvement.

The results showed significant variations in sales and profitability across different periods and business clusters. Monthly analysis highlighted May as a peak demand period, while daily and weekly data revealed specific patterns and peak days. Cluster-wise analysis differentiated performance among business types, and location-wise profit data exposed regional disparities. These findings underscore trends that impact overall profitability and efficiency.

The findings reveal inefficiencies, such as excess inventory and inconsistent demand, leading to financial losses and operational instability. Recommendations include investing in high-performing clusters, improving inventory management with just-in-time systems, and using data-driven strategies to enhance sales forecasting and resource allocation. By addressing these issues, the company can stabilize operations, boost profitability, and make more informed strategic decisions.

2: Detailed Explanation of Analysis Process/Method

Link of dataset: BDM Dataset

Overview of the Analytical Procedure:

The analysis undertaken in this project aimed to address the specific challenges encountered by Ganesh Fertilizer, an agrochemical store. This project primarily focused on understanding the sales and purchase patterns, as well as tracking sales trends over time. By conducting this

analysis, the goal was to develop practical recommendations to overcome these challenges and promote business growth.

Delving into the sales and purchase data is essential for comprehending the several factors that influence a business's performance. This process involves identifying trends, patterns, and areas for potential improvement. Such insights enable us to make well-informed decisions, improve inventory management, and devise strategies to enhance both sales and profitability.

The analytical process is crucial for recognizing opportunities, mitigating risks, and bolstering the business's competitive edge. By leveraging data-driven insights, we can proactively address the challenges faced by Ganesh Fertilizer, thereby fostering sustainable growth in a highly competitive market. This comprehensive analysis not only aids in tackling immediate issues but also sets a foundation for long-term strategic planning and success.

Sales and Revenue Analysis:

By thoroughly analyse the sales and purchase data, a systematic approach was implemented to derive significant insights and identify emerging trends. The main emphasis was on summarizing the data monthly to detect patterns and facilitate informed decision-making. This in-depth analysis included the creation of pivot tables and the development of graphical representations to effectively visualize the data. An important initial step involved adding a "Week" column to the dataset. This was achieved using an Excel formula to determine the week number for each transaction date. By using the formula =WEEKNUM, the cell containing the transaction date, we were able to assign a week number to each record. The "Week" column plays a crucial role in our analysis by allowing us to observe weekly trends and patterns in sales and purchases.

- **Solution approaches to solve problems:**

1. Inventory management

a) **Identifying Demand Patterns**: By summarizing the sales data monthly and observing weekly trends through the "Week" column, the analysis reveals fluctuations in demand. Understanding these patterns allows you to predict future sales more accurately, enabling better inventory planning.

b) **Optimizing Inventory Levels**: With insights into high and low sales periods, owner can adjust inventory levels accordingly. For example, during peak demand weeks, you can increase stock levels to avoid stockouts, while in slower periods, you can reduce inventory to minimize holding costs.

c) **Preventing Stockouts and Overstocks**: Weekly and monthly analysis can alert owner to products that are selling out faster than anticipated, allowing you to reorder in time. Similarly, for slow-moving items, it highlights the need to decrease future orders or implement strategies to clear excess stock.

2. Weak operational process and future prediction

a) **Identifying Bottlenecks and Inefficiencies**: By analysing revenue data, owner can pinpoint periods where sales were below expectations. Cross-referencing this with operational data (like production or supply chain timelines) might reveal bottlenecks, such as delays in product delivery or inefficiencies in production processes. Identifying these issues allows for targeted improvements.

b) **Improving Supply Chain Management**: Consistent analysis can reveal issues in the supply chain, such as delays in receiving materials or inconsistencies in supplier quality. By recognizing patterns of revenue dips corresponding to these operational issues, you can take steps to renegotiate with suppliers, change vendors, or improve logistics.

c) **Trend Identification**: Regular analysis of revenue data reveals trends that can be extrapolated to predict future performance. This includes identifying seasonal peaks, product life cycles, and emerging market trends, which can inform future planning and decision-making.

d) **Strategic Planning**: The insights gained from revenue analysis feed into long-term strategic planning. Understanding where the business is headed financially allows leadership to make informed decisions about expansion, investment, and growth strategies.

Cluster formation:

This granularity helps in identifying short-term fluctuations and understanding the impact of specific events or promotions within each week. This ordered approach facilitated the creation of detailed pivot tables, which summarized key metrics and provided a clear overview of sales and purchase activities. Additionally, graphical representations such as charts and graphs were generated to visualize these trends more intuitively.

CLUSTER	COMPANY
Global Multinational Corporations	BASF
	BAYER
	FMC
	TATA
	UPL
Large Indian Multinationals	IFFCO
	KRIBHCO
	NFL
	DHANUKA
Regional Leaders	AGRO LIFE
	NAGARAJUNA
	OMER AGRO CROP
	TROPICAL AGRO
Specialized crop protection	ANDATA
	ARIES
	HERANBA
Emerging Players	CRYSTAL
	HARI HAR
	SHAKTIMAN
	SPARATAN
Diversified Product Range	IPL
	NUCHINO
	O MAX

- **Connecting Clustering Analysis to Key Business Challenges:**

  Clustering improves inventory management by grouping companies into clusters, which streamlines data processing and segmentation. This organization makes it easier to analyze sales and purchase activities within each cluster, allowing for more accurate inventory forecasting and management based on cluster-specific trends.

  By clustering data, we can enhance the clarity of operational analysis. Grouping data points by clusters reduces clutter in graphical representations, making it easier to identify and address operational inefficiencies and performance variations across different clusters. Clustering aids in future predictions by providing a clearer view of patterns and trends within each cluster. This granularity allows for more precise forecasting and strategic adjustments, as companies can be analysed based on their cluster's specific performance and market conditions.

- **Comparative Analysis:**

  Comparative analysis through clustering aids inventory management by highlighting performance differences across clusters, enabling targeted inventory adjustments based on specific trends. It addresses weak operational processes by identifying inefficiencies within clusters, guiding operational improvements. Additionally, this analysis supports future predictions by revealing performance patterns across clusters, which helps in forecasting trends and making informed strategic decisions.

Profit Analysis:

Profit analysis begins with calculating profit using the formula: Profit = (Total Revenue - Original Cost) * Volume. This calculation provides a clear measure of financial performance by assessing the difference between revenue and costs, multiplied by the volume of sales. By breaking down profit into daily, weekly, and monthly intervals, as well as other relevant criteria, businesses can gain insights into how profitability varies over time and across different dimensions. This detailed analysis helps in understanding patterns and trends, such as peak profitability periods or fluctuations in profit margins.

To visualize and interpret these findings effectively, pivot tables and graphical representations are employed. Pivot tables summarize and organize the profit data, making it easier to compare performance across various time frames and criteria. Graphs and charts then provide a visual depiction of profit trends, helping to identify key patterns and anomalies briefly. This combination of detailed numerical analysis and intuitive visualization supports strategic decision-making by highlighting areas for potential improvement and opportunities for growth, leading to more informed and effective financial management.

In my mid-term report, I previously submitted pivot tables and charts for total sales, some of which are also utilized in this analysis alongside the respective pivot tables and charts for profit. By comparing both sets of data, this approach provides a more comprehensive understanding of financial performance, allowing for clearer insights into how sales trends correlate with profitability.

By comparing pivot tables and charts for both total sales and profit, this analysis directly impacts inventory management and operational processes. Understanding the correlation between sales trends and profitability allows for more precise inventory adjustments, ensuring that stock levels align with profitable products and sales patterns. Additionally, this comparison helps identify operational inefficiencies by highlighting areas where sales are strong but profitability lags, guiding targeted improvements in operations and inventory strategies.

3. Result and Findings:

i. Inventory Management

To effectively manage inventory, graphs such as Monthly Demand Analysis and Daily Demand Analysis are essential for aligning stock levels with actual demand and forecasting future needs. Sales and Profit Monthly Analysis, along with Weekly Profit Analysis, provide insights into sales performance and help in adjusting inventory levels to prevent stockouts or overstocking. Revenue and Profit Trend analysis offers a broader view of financial performance, aiding in long-term inventory planning. Location-wise and Cluster-wise Analyses help tailor inventory strategies to specific regions and product categories. These graphs collectively enable precise inventory control and better preparation for demand fluctuations. Payment methods like UPI provide real-time sales data, enhancing inventory tracking and demand forecasting. They also improve cash flow, allowing for more timely restocking.

ii. Weak Operational Process and Future Predictions

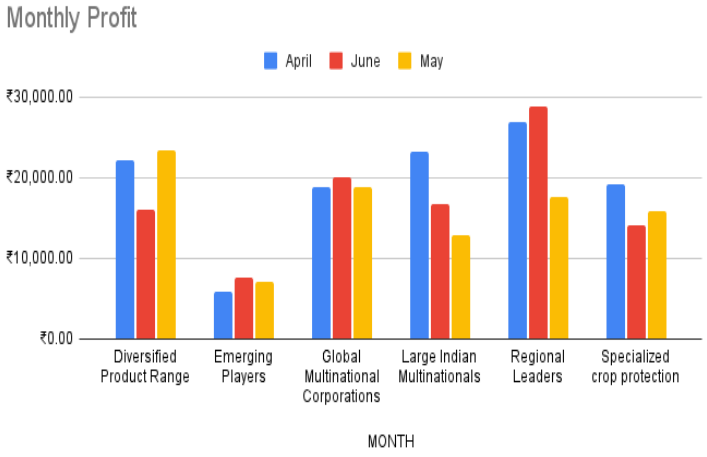
For addressing weak operational processes, Day-wise Sales and Profit Analysis, and Weekly Profit Analysis help identify inefficiencies and operational bottlenecks, enabling quicker adjustments. Sales and Profit Monthly Analysis provides a comprehensive view of operational efficiency over time. Location-wise and Cluster-wise Analyses pinpoint areas needing improvement based on profitability, leading to targeted operational enhancements. For future predictions, Revenue and Profit Trend analysis is crucial for long-term forecasting, while Monthly and Daily Demand Analyses support both short-term and long-term planning. Although Payment Distribution and Customer-wise Analysis provide additional insights, they are less central but still valuable for refining overall strategies. These payment methods

streamline operations by reducing checkout times and errors. They offer detailed customer insights for accurate future predictions and strategic adjustments.

Followings are the above-mentioned graph:

3.1 Sales and profit monthly analysis: The analysis shows "Large Indian Multinationals" leading in sales, peaking in May, and maintaining strong profits, particularly in June. "Regional Leaders" achieve the highest profit in June, with ₹30,000. "Global Multinational Corporations" and "Regional Leaders" also perform well in both sales and profits. "Diversified Product Range" has consistent performance, with notable increases in June, while "Emerging Players" struggle with lower sales and profits. Overall, the latter months show strong market performance for key clusters.

SUM of DAILY P	CLUSTER NAME					
MONTH	Diversified Prodt	Emerging Player	Global Multinatio	Large Indian Mul	Regional Leader	Specialized crop
April	₹22,184.00	₹5,868.80	₹18,816.57	₹23,186.19	₹26,908.27	₹19,193.80
June	₹16,095.50	₹7,534.55	₹20,019.85	₹16,666.49	₹28,929.80	₹14,140.90
May	₹23,331.50	₹7,131.62	₹18,858.70	₹12,887.47	₹17,639.90	₹15,856.40
Grand Total	**₹61,611.00**	**₹20,534.97**	**₹57,695.12**	**₹52,740.15**	**₹73,477.97**	**₹49,191.10**



SUM of TOTAL	CLUSTER NAME					
MONTH	Diversified Prodt	Emerging Player	Global Multinatio	Large Indian Mul	Regional Leader	Specialized crop
April	₹187,245.00	₹32,696.00	₹135,412.99	₹302,084.00	₹186,223.00	₹158,140.00
June	₹147,080.00	₹43,756.66	₹154,545.00	₹216,792.00	₹225,781.00	₹112,750.00
May	₹212,400.00	₹42,681.66	₹133,522.00	₹208,871.00	₹131,835.00	₹150,350.00
Grand Total	**₹546,725.00**	**₹119,134.32**	**₹423,479.99**	**₹727,747.00**	**₹543,839.00**	**₹421,240.00**

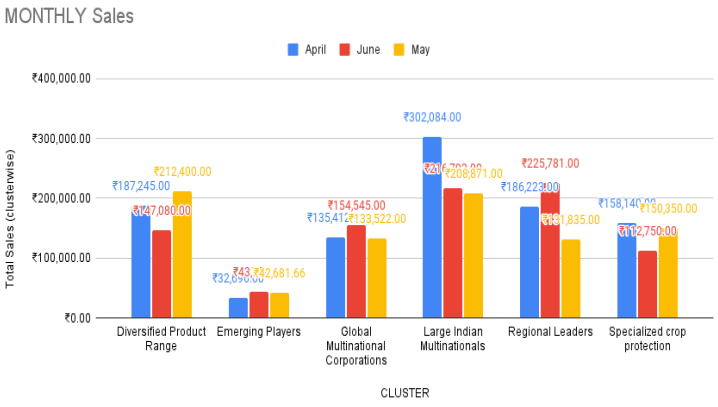


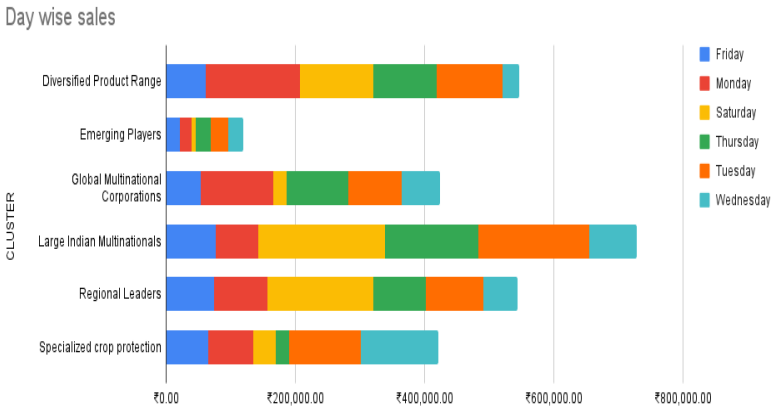
Fig-4: Monthly Analysis

Conclusion: "Large Indian Multinationals" are the market leaders in sales, while "Regional Leaders" excel in profitability, particularly in June. Regional leaders consistently show the highest profits, peaking in the consistent performance of "Diversified Product Range" and the challenges faced by "Emerging Players" indicate varied market dynamics. Large Indian Multinationals" such as IFFCO, KRIBHCO, NFL, DHANUKA while emerging players which means AGRO LIFE, NAGARAJUNA, OMER AGRO, TROPICAL AGRO are least contributors across all months. Overall, the latter months, especially June, show increased sales and profits across most clusters.

3.2 Day wise sales and profit analysis:

Daily analysis entails examining the demand for products or services each day to identify patterns and fluctuations.

SUM of TOTAL	CLUSTER NAME					
DAY	Diversified Prodt	Emerging Player	Global Multinatio	Large Indian Mu	Regional Leader	Specialized crop
Friday	₹60,745.00	₹20,790.66	₹53,240.99	₹75,981.00	₹74,085.00	₹65,240.00
Monday	₹146,450.00	₹18,052.00	₹111,988.00	₹65,993.00	₹81,548.00	₹69,370.00
Saturday	₹113,135.00	₹6,050.00	₹20,715.00	₹196,534.00	₹164,038.00	₹34,910.00
Thursday	₹97,450.00	₹22,968.00	₹95,252.00	₹143,887.00	₹82,010.00	₹19,770.00
Tuesday	₹102,480.00	₹27,415.00	₹82,520.00	₹172,290.00	₹88,993.00	₹111,560.00
Wednesday	₹26,465.00	₹23,858.66	₹59,764.00	₹73,062.00	₹53,165.00	₹120,390.00
Grand Total	**₹546,725.00**	**₹119,134.32**	**₹423,479.99**	**₹727,747.00**	**₹543,839.00**	**₹421,240.00**



SUM of DAILY P	CLUSTER NAME					
DAY	Diversified Prodt	Emerging Player	Global Multinatio	Large Indian Mul	Regional Leader	Specialized crop
Friday	₹7,286.10	₹3,761.53	₹7,171.51	₹4,631.23	₹9,071.40	₹9,006.00
Monday	₹16,779.60	₹3,171.10	₹15,105.38	₹5,325.81	₹11,280.49	₹8,446.50
Saturday	₹12,968.80	₹1,205.00	₹2,645.80	₹5,624.94	₹23,497.34	₹4,254.00
Thursday	₹10,705.80	₹3,544.78	₹13,400.15	₹10,771.48	₹10,641.30	₹2,330.60
Tuesday	₹11,466.30	₹4,565.10	₹10,848.50	₹21,060.36	₹12,109.24	₹11,060.80
Wednesday	₹2,404.40	₹4,287.46	₹8,523.78	₹5,326.34	₹6,878.20	₹14,093.20
Grand Total	**₹61,611.00**	**₹20,534.97**	**₹57,695.12**	**₹52,740.15**	**₹73,477.97**	**₹49,191.10**

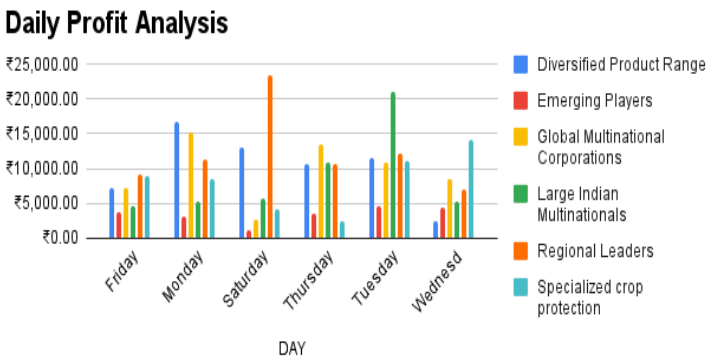


Fig-5: Daily Analysis

Conclusion: "Large Indian Multinationals" dominate in total sales, especially on Wednesdays and Mondays, while "Global Multinational Corporations" achieve the highest profits on Saturdays. "Regional Leaders" also show significant sales on Thursdays and Tuesdays. "Diversified Product Range" and "Specialized Crop Protection" maintain consistent

performance, whereas "Emerging Players" struggle in both sales and profits. Overall, Wednesday and Saturday emerge as peak days for sales and profit, respectively.

3.3 Weekly profit analysis:

The "Weekly Profit Analysis" graph highlights diverse profit trends across six business categories over nine weeks.

SUM of DAILY P	*CLUSTER NAME*					
WEEK	Diversified Prodı	Emerging Player	Global Multinatio	Large Indian Mul	Regional Leader	Specialized crop
Week 1	₹7,711.50	₹999.78	₹5,652.00	₹16,677.66	₹5,301.63	₹8,503.20
Week 10	₹4,914.00	₹309.20	₹3,931.65	₹3,552.95	₹7,345.00	₹2,274.20
Week 11	₹4,979.10	₹3,648.21	₹8,851.00	₹7,726.22	₹5,763.40	₹3,484.60
Week 12	₹1,645.60	₹1,720.45	₹2,203.00	₹2,089.08	₹8,581.40	₹5,940.00
Week 13	₹2,860.80	₹1,694.49	₹3,444.70	₹2,611.81	₹7,069.50	₹2,239.10
Week 2	₹6,170.00	₹1,273.45	₹1,772.00	₹2,426.44	₹8,991.20	₹2,621.20
Week 3	₹4,489.10	₹1,137.18	₹6,972.57	₹2,294.60	₹4,037.00	₹4,666.80
Week 4	₹3,813.40	₹1,948.40	₹3,748.00	₹1,739.50	₹7,967.00	₹3,297.00
Week 5	₹389.60	₹1,513.60	₹8,557.58	₹696.80	₹5,974.74	₹4,093.20
Week 6	₹8,588.00	₹1,536.48	₹3,922.00	₹2,710.31	₹1,662.80	₹791.30
Week 7	₹3,826.50	₹1,427.95	₹1,499.00	₹5,357.18	₹2,580.60	₹2,852.50
Week 8	₹6,759.40	₹205.50	₹4,468.13	₹2,502.10	₹5,123.40	₹1,044.00
Week 9	₹5,464.00	₹3,120.30	₹2,673.50	₹2,355.51	₹3,080.30	₹7,384.00

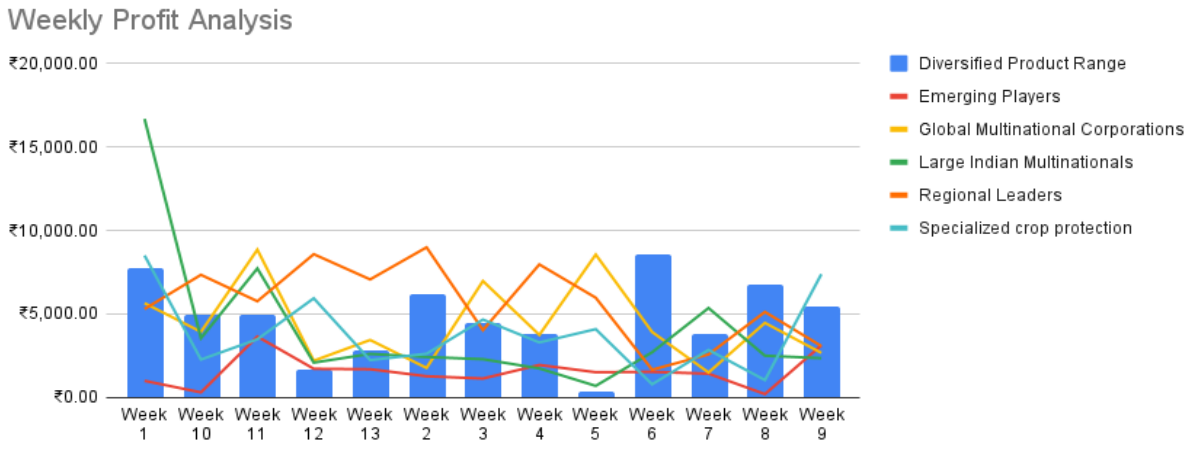


Fig-6: Weekly analysis

Conclusion: The above graph illustrates the profit trends of six distinct categories of businesses over a nine-week period. The Diversified Product Range category shows consistent performance with noticeable profit peaks in Weeks 1, 6, and 8, indicating stability and growth. Emerging Players exhibit fluctuating profits, suggesting instability and potential growth phases. Global Multinational Corporations maintain moderate and steady profit levels, with a slight decline towards Week 9. Large Indian Multinationals demonstrate high volatility, especially with a significant spike in Week 1 followed by lower performance. Regional Leaders

maintain stable profits with minor fluctuations, while Specialized Crop Protection companies display low but stable profit trends, with slight improvements in later weeks. Overall, Diversified Product Range companies appear to be the most consistently profitable, while Emerging Players and Large Indian Multinationals show the most volatility.

3.4 Cluster wise analysis:

A pie chart provides a detailed breakdown of profits among six business categories. It highlights the significant contributions of Regional Leaders and Diversified Product Range to the overall profit distribution.

CLUSTER NAM	SUM of DAILY P
Diversified Produ	₹61,611.00
Emerging Player	₹20,534.97
Global Multinatio	₹57,695.12
Large Indian Mul	₹52,740.15
Regional Leader	₹73,477.97
Specialized crop	₹49,191.10

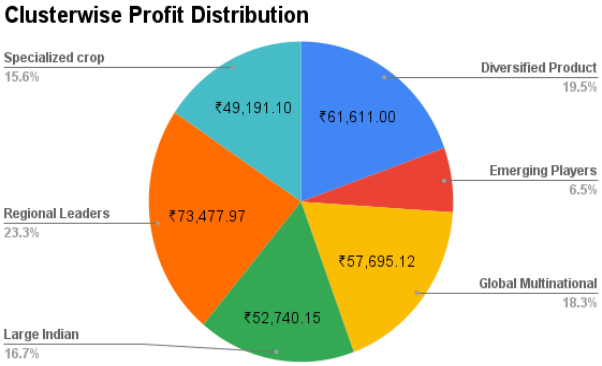


Fig-7: Cluster wise distribution

"Cluster wise Profit Distribution" pie chart shows the distribution of profits among six business categories. Regional Leaders hold the largest share of the total profit at 23.3%, amounting to ₹73,477.97. Diversified Product Range follows with 19.5% and ₹61,611.00, indicating impressive performance. Global Multinational Corporations account for 18.3% with ₹57,695.12, and Large Indian Multinationals contribute 16.7% with ₹52,740.15. Specialized Crop Protection holds 15.6% with ₹49,191.10, while Emerging Players have the smallest share at 6.5%, totalling ₹20,914.50. The chart indicates that Regional Leaders and Diversified Product Range are the most profitable clusters, whereas Emerging Players contribute the least to overall profits.

3.5 Revenue and profit trend:

The "Monthly Sales and Profit Trend" graph reveals the declining pattern of total sales and daily profits over a three-month period. This trend highlights the need for strategic interventions to counteract the observed decrease.

MONTH	SUM of TOTAL	SUM of DAILY P
April	₹1,001,800.99	₹116,157.63
June	₹900,704.66	₹103,387.09
May	₹879,659.66	₹95,705.60

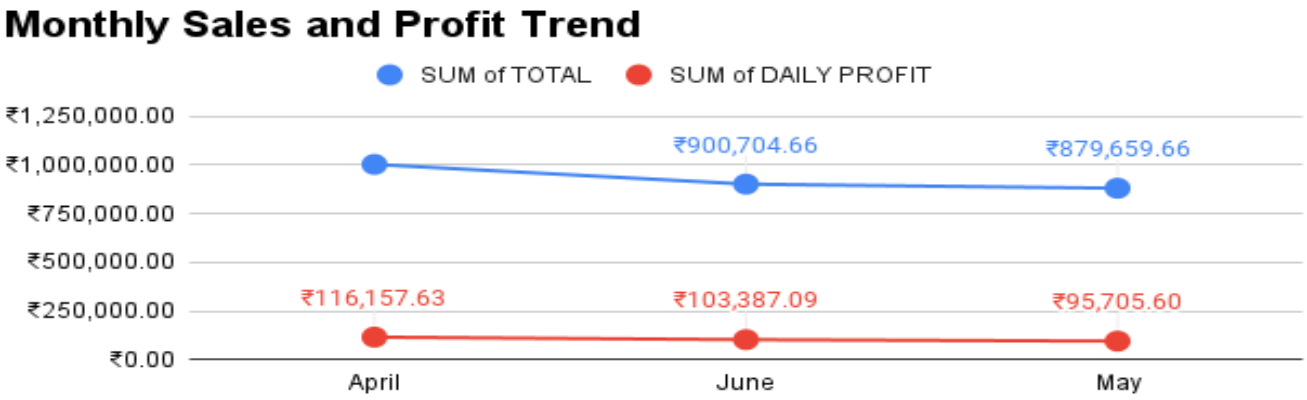


Fig-8: Monthly Sales and Profit Trend

The total sales (blue line) and daily profit (red line) for April, June, and May. From the graph, it is evident that total sales are decreasing over the three months, starting at ₹1,000,000 in April, declining to ₹900,704.66 in June, and further to ₹879,659.66 in May. Similarly, daily profits show a downward trend, beginning at ₹116,157.63 in April, dropping to ₹103,387.09 in June, and reaching ₹95,705.60 in May. This indicates that both total sales and daily profits are consistently declining over the observed period, suggesting a need for strategies to boost sales and improve profit margins.

3.6 Location wise profit:

The graph presents an analysis of daily profit across various locations, revealing a wide range of profitability. Significant discrepancies are observed, with certain areas achieving notably higher profits while others report minimal gains. This data highlights the diverse economic performance among the locations.

LOCATION	SUM of DAILY P
Aleva	₹11,675.14
Barsola	₹19,056.25
Budha khera	₹526.50
Dahola	₹49,204.85
Dumerkhan	₹15,898.45
Gharwal	₹4,474.10
Jind	₹46,645.21
Julana	₹5,398.08
Kaithal	₹11,564.55
Kalwa	₹9,378.65
Kandela	₹22,007.94
Karsola	₹22,602.28
Nagura	₹7,216.72
Narwana	₹14,967.50
Pillu khera	₹1,840.60
Pindara	₹5,990.40
Radhana	₹7,448.35
Rajpura	₹8,006.38
Ramrai	₹16,262.73
Rohera	₹7,750.47
Safidon	₹9,980.20
Uchana	₹17,354.99

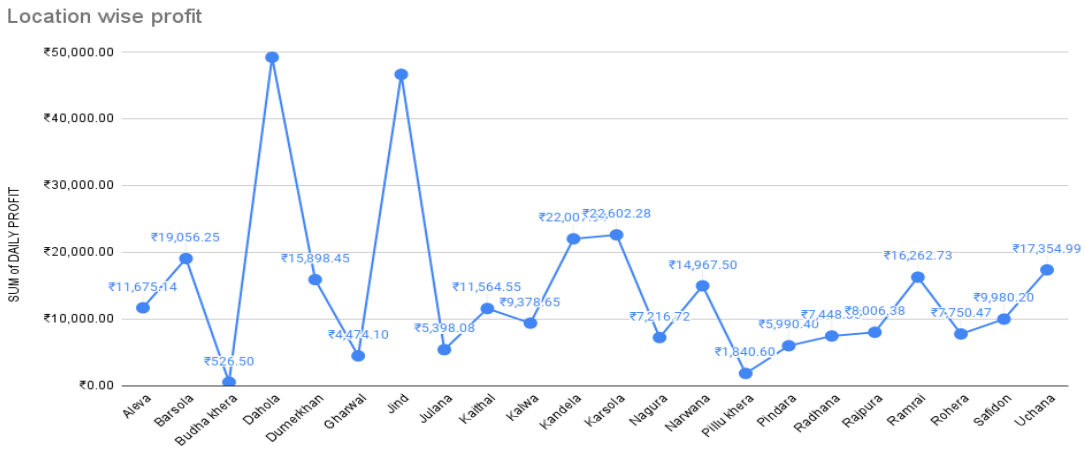


Fig-9: Location wise profit

It shows the daily profit distribution across various locations, showing significant variation. Notably, Dahola and Kasola stand out with the highest profits of ₹49,440.84 and ₹22,602.28, respectively. In contrast, Barsola and Jind exhibit the lowest profits, recording just ₹526.50 and ₹4,474.10, respectively. Other locations such as Alwa, Pillu Khera, and Uchana also show substantial profits, with figures like ₹11,675.14, ₹5,990.40, and ₹17,354.99, respectively. This suggests a diverse performance across different areas, with some locations demonstrating exceptionally high profitability while others lag behind.

3.7 Monthly demand analysis:

The graph shows the distribution of product demand over the months of April, May, and June. May stands out with the highest demand levels across most categories, while April tends to have the lowest. This variation highlights significant differences in monthly demand patterns among the various companies and products.

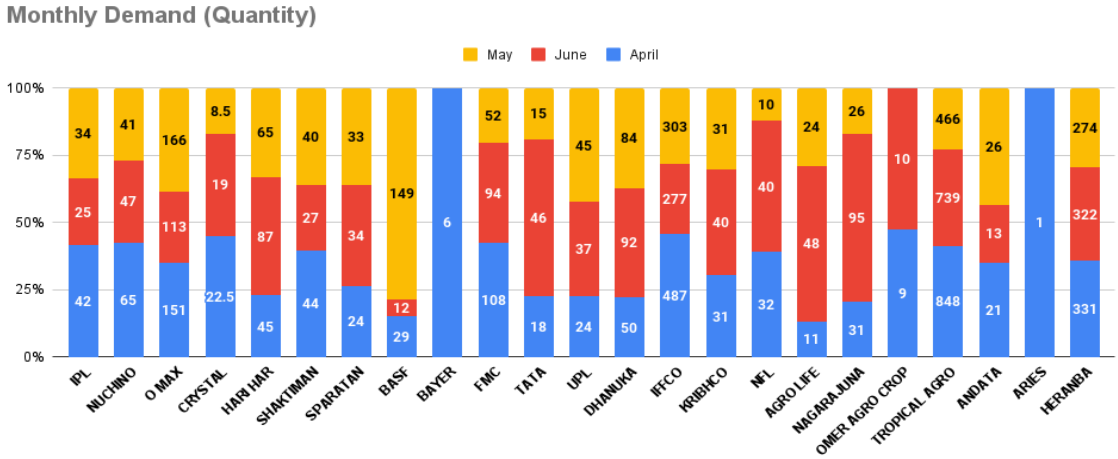


Fig-10: Monthly demand

May exhibits the highest demand in most categories, represented by the prominent yellow bars. June's demand (red bars) shows notable figures in categories like OMAX and SHAKTIMAN, while April (blue bars) records lower demand in most cases. Notably, companies such as IPL and TATA display a balanced distribution across all three months, whereas companies like BASF and NFL have significant spikes in May. This indicates that May is typically the peak month for demand, with substantial variability among various products and companies.

3.8 Payment distribution:

The pie chart provides an analysis of payment distribution between two payment methods: Cash and UPI.

WAY OF PAYME	SUM of TOTAL
CASH	₹850,896.31
UPI	₹1,931,269.00
Grand Total	**₹2,782,165.31**

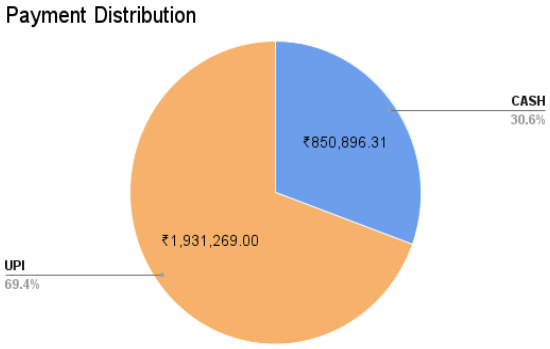
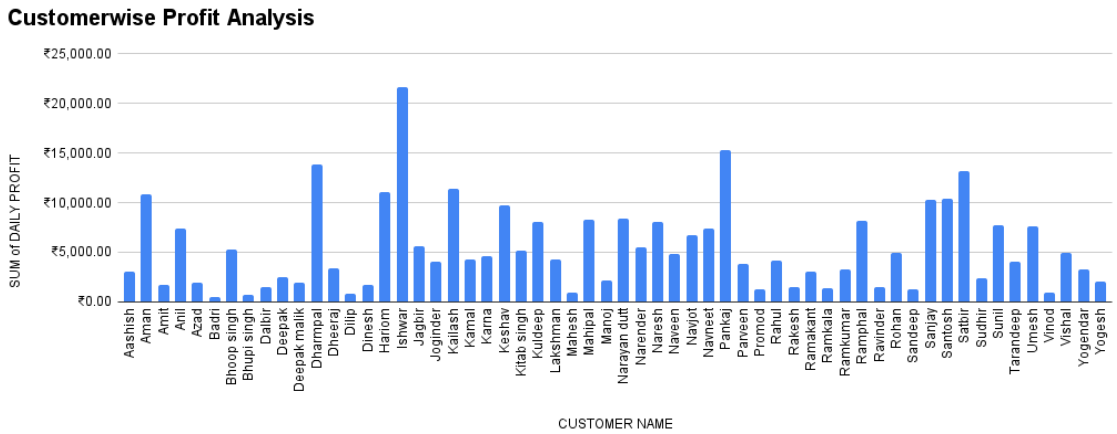


Fig-11: Daily Profit analysis

A substantial portion of the sales, amounting to ₹1,931,269 or 69.4%, is attributed to UPI transactions. In contrast, cash payments contribute ₹850,896.31 accounting for 30.6% of the total sales. This indicates a clear preference for UPI as the dominant mode of payment. The data suggests that businesses might benefit from promoting and facilitating UPI transactions further, given their significant share in the total sales distribution.

3.9 Customer wise analysis:

The two charts offer a detailed view of customer profitability and transaction frequency, revealing significant differences in profit contributions and transaction counts.



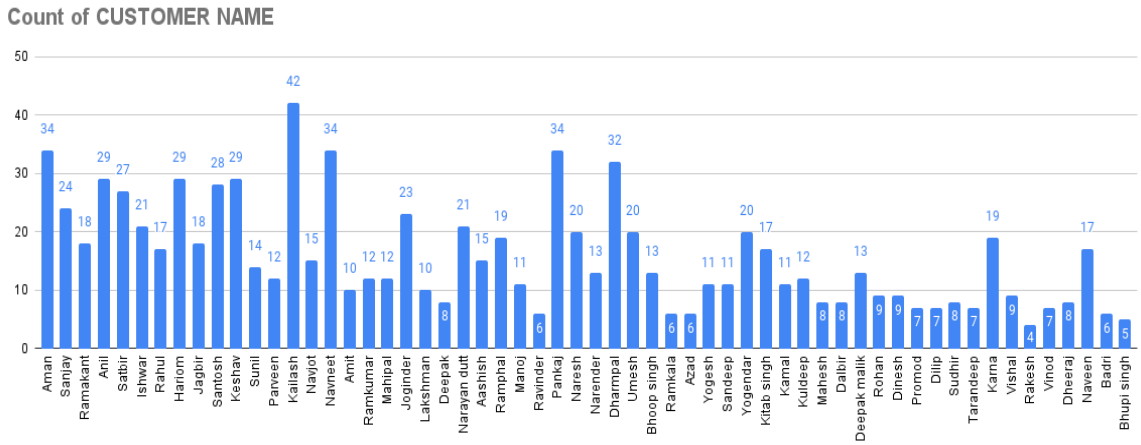


Fig-12: Customer wise analysis

The first chart, titled "Customer wise Profit Analysis," illustrates the diverse profit contributions from each customer, highlighting significant disparities. Customers such as Dipak and Manoj emerge as top profit generators. The second chart, "Count of Customer Name," depicts the number of transactions per customer, with Rajesh and Ajay leading in transaction counts. When comparing both charts, it becomes clear that a high number of transactions does not necessarily equate to higher profits, suggesting variability in transaction values among customers. This analysis aids in pinpointing both high-value customers and those with frequent but lower-value transactions, facilitating more precise marketing and customer engagement efforts.

3.10 Daily demand analysis:

The "Daily Demand Analysis" chart highlights significant fluctuations in demand for various companies throughout the week.

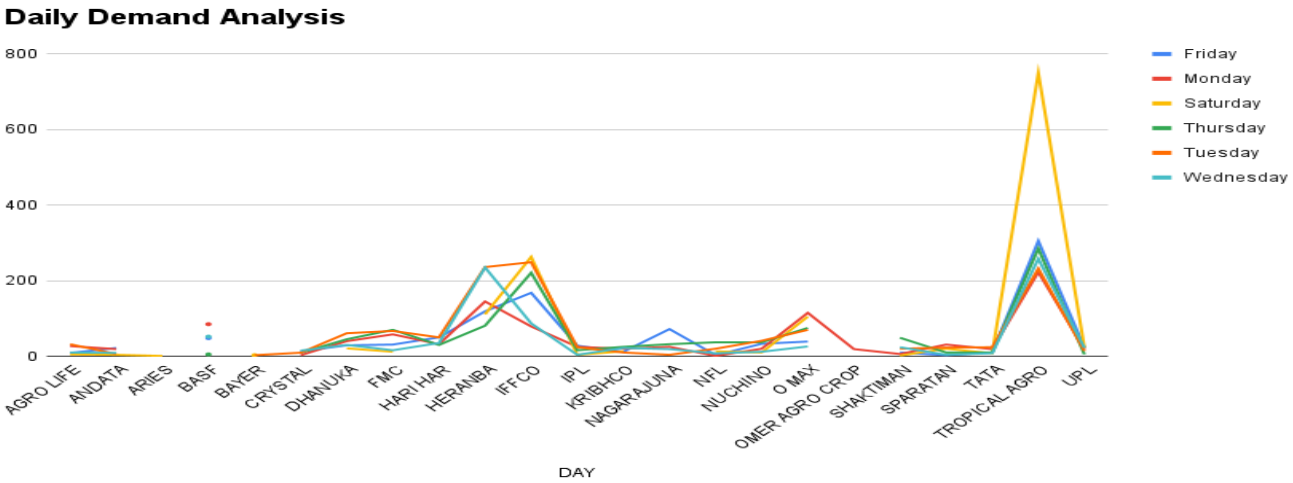


Fig-13: Daily demand analysis

As we can see there is a noticeable spike in demand for TROPICAL AGRO on Tuesday, significantly higher than any other day or company, indicating a specific peak in their operations. Other companies, such as IFFCO and IPL, also show increased demand on certain days, but not as prominently as TROPICAL AGRO. This pattern suggests that demand is not evenly distributed throughout the week and varies among companies. Identifying these peaks can help companies optimize their supply chain and resource allocation to better meet the fluctuating demand. This analysis can guide strategic planning for inventory management and staffing to improve efficiency and customer satisfaction.

4. Interpretation of Outcomes and Recommendations:

The detailed analysis of data from **Shri Ganesh Fertilizer** has revealed crucial insights into the company's performance and emerging trends. Based on these findings, we can draw several interpretations and provide actionable recommendations to enhance business outcomes.

- **Insights and strategic recommendation of business cluster:**

  In fig: 4, the monthly sales and profit trends from April to June show varied patterns across business clusters. The Diversified Product Range sees a steady increase in demand, while Emerging Players struggle with low but slightly improving sales and profits. Global Multinational Corporations remain stable, despite a dip in May. Large Indian Multinationals peak in April before declining, and Regional Leaders maintain steady performance with a May peak. Specialized Crop Protection remains stable, with a slight decrease in June.

  These trends indicate underlying operational inefficiencies and highlight the need for improved future forecasting. For instance, the decline in profits for Large Indian Multinationals after a peak in April suggests an operational issue that needs investigation. Similarly, the struggles of Emerging Players point to the necessity for targeted strategies to enhance market penetration and profitability. Addressing these operational challenges will help stabilize performance and improve future predictions, enabling the company to make more informed and effective strategic decisions.

  Recommendation:

  Capitalize on these trends; it is recommended that the company continue investing in the Diversified Product Range, leveraging its growing demand and profitability. For Emerging Players, targeted marketing and strategic promotions are advised to increase market penetration. Global Multinational Corporations should address the factors

behind the May dip and strengthen customer relationships to stabilize performance. Large Indian Multinationals should investigate the April peak and subsequent decline, potentially diversifying offerings to maintain high sales levels year-round. Regional Leaders should maintain their current strategies while exploring new regions to enhance growth. Lastly, Specialized Crop Protection should focus on product innovation and quality improvement to stabilize and boost sales and profits.

- **Ineffective financial oversight:**

  The location-wise profit analysis from fig: 9 reveals notable variations across different areas. Jind and Dahola stand out with the highest daily profits, indicating strong market presence and demand. Karsola and Uchana also show relatively high profits, suggesting effective sales strategies. Moderate profits are observed in locations like Kalwa and Julana (₹9378.65, ₹5398.08), indicating steady performance with room for growth. However, low profits in Bhudha Khera with ₹526.50, and several other locations suggest challenges such as low demand or high competition. Sporadic profits in Aleva, Rohera, and Safidon indicate inconsistent demand or operational inefficiencies.

  The variations in location-wise profits indicate operational inefficiencies and the need for better strategic forecasting. High-profit areas like Jind and Dahola demonstrate strong operational effectiveness, while low-profit locations such as Bhudha Khera highlight potential weaknesses in marketing, distribution, or competition. Sporadic profits in certain locations suggest inconsistencies in demand or supply chain issues, underscoring the need for targeted operational improvements and more accurate future predictions. Addressing these disparities will help stabilize operations and enhance strategic decision-making, leading to better financial oversight and resource allocation.

  Recommendation:

  Shri Ganesh Fertilizer should continue to strengthen marketing and distribution strategies in high-profit locations and invest in customer engagement initiatives. For moderate-profit areas, exploring opportunities to increase market share through targeted promotions and enhanced customer service is advised. Low-profit locations require a thorough market analysis to identify issues and implement localized marketing campaigns or partnerships to stimulate demand. Addressing sporadic profits involves investigating the causes and stabilizing operations through improved supply chain efficiency and consistent product availability. A tailored approach for each

location, based on specific market conditions and regular performance monitoring, is essential for optimal resource allocation and strategy adaptation.

- **Weekly Profit Analysis Insights:**

  In fig: 6 the weekly profit analysis for six different categories over nine weeks reveals varied performance across the board. The "Diversified Product Range" category, represented by blue bars, consistently shows moderate to high profits, peaking at weeks 1 and 6. "Global Multinational Corporations" and "Regional Leaders," depicted in yellow and orange lines, respectively, show significant fluctuations but generally maintain higher profit levels compared to other categories. "Large Indian Multinationals" (green line) exhibit a steep decline after week 1 but stabilize at a lower profit level. "Emerging Players" (red line) show low and stable profits throughout the period. "Specialized Crop Protection" (cyan line) has varied performance, with notable peaks and troughs.

  The fluctuations in weekly profits across different categories suggest weaknesses in operational processes and the need for better future forecasting. The steep decline in profits for Large Indian Multinationals after week 1 highlights potential operational inefficiencies, such as supply chain disruptions or ineffective marketing strategies. Similarly, the low and stable profits of Emerging Players and the volatility in Specialized Crop Protection indicate the need for strategic adjustments and innovation. Addressing these operational challenges will help stabilize performance, enhance profitability, and improve the accuracy of future predictions, leading to more effective long-term planning and decision-making.

Recommendation:

To enhance profitability, focus on stabilizing the performance of "Large Indian Multinationals" by addressing the causes of their steep decline in early weeks. For "Emerging Players," strategies to boost their market presence and profitability should be explored, such as increasing investment in innovation and marketing. Meanwhile, maintaining the current strategies for "Diversified Product Range," "Global Multinational Corporations," and "Regional Leaders" would be prudent, as they show relatively strong and consistent profits. Special attention should be given to the volatile performance of "Specialized Crop Protection" to identify and mitigate the factors contributing to their fluctuations.

- **Demand Analysis: Daily Trends and Monthly Variability:**

  The fertilizer store is currently facing inefficiencies and profitability issues due to excess inventory. The surplus stock ties up capital that could be used for other business operations and increases the risk of goods expiring before they can be sold. These factors are leading to significant financial losses for the store.

  The issues related to excess inventory are closely tied to both daily and in fig:10 monthly demand analysis. In fig: 13 Daily demand analysis reveals a noticeable spike in demand for TROPICAL AGRO on Tuesdays, significantly higher than other days, indicating peak operational periods. Companies like IFFCO and IPL also show increased demand on certain days, suggesting that demand varies throughout the week. Monthly demand analysis shows that May exhibits the highest demand across most categories, while June and April display variable figures. Companies such as IPL and TATA have balanced demand distributions, whereas BASF and NFL experience significant spikes in May. Aligning inventory with these demand patterns can prevent overstocking and minimize the risk of expiration.

  This excess inventory problem reflects ineffective inventory management practices. The lack of alignment between inventory levels and actual demand trends, highlighted by daily and monthly demand analyses, leads to financial losses. Implementing strategies like just-in-time inventory, leveraging data analytics for improved sales forecasting, and conducting regular inventory audits can address these issues. By aligning inventory levels with demand spikes and troughs, the store can enhance its inventory management, reduce excess stock, and improve profitability.

  Recommendations:

  The fertilizer store should implement a just-in-time inventory system to align stock levels with actual demand, as identified through daily and monthly analyses. This will free up capital and reduce the risk of expiration. Utilizing data analytics for improved sales forecasting will enable more effective inventory planning. Regular inventory audits can identify slow-moving items for strategic discounting or bundling. Strengthening supplier relationships for flexible purchasing terms will facilitate smaller, more frequent deliveries. Additionally, implementing a robust inventory management system to track expiration dates and prioritize the sale of older stock, along with targeted promotional campaigns, can help move excess inventory quickly and attract customers. Adopting these strategies will enhance inventory management, operational efficiency, and overall profitability.

CONCLUSION:

To overcome these challenges, a comprehensive approach is necessary, focusing on inventory management, demand forecasting, supply chain coordination, and operational efficiency. By implementing these strategies such as quantities sold, total sales, and daily profits for each product category, the business can identify trends, capitalize on peak sales periods, and optimize its operations. The first step in addressing these issues is to optimize inventory management. Adopting a just-in-time inventory system can help the company reduce excess stock levels, thereby freeing up capital that can be used for other critical business operations. This system ensures that inventory is ordered and received only as needed, minimizing the risk of overstocking and product expiration. Moreover, regular inventory audits should be conducted to identify slow-moving or non-moving items. These audits will enable the company to make informed decisions about discounting or bundling such items to accelerate their sale, thus reducing losses due to expired products. Accurate demand forecasting is another crucial area that requires attention. Utilizing advanced data analytics can significantly improve the accuracy of sales forecasts. By predicting customer demand more precisely, this approach will help in aligning inventory levels with actual market demand, reducing the likelihood of both overstocking and stockouts. Supply chain coordination is also vital for operational efficiency. Strengthening relationships with suppliers to negotiate more flexible purchasing terms can lead to smaller, more frequent deliveries that better match sales patterns. Finally, targeted promotional campaigns can play a significant role in moving excess inventory quickly.