Data Driven Business Optimization for Kirana Store

A Mid-Term report for the BDM capstone Project

Submitted by

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1 Executive Summary

This project focuses on optimizing inventory management and SKU profitability for Bansal Kirana Store to address key challenges such as excessive inventory cost , ineffective demand tracking and limited SKU profitability . By Leveraging data-driven insights from a detailed analysis of sales trend and revenue contribution ,this initiative aims to enhance operational efficiency and maximize profit margins.

The dataset comprises sales record for 35 SKUs , including staples , dry fruits , packaged goods, and household items, over a 55 days period . A significant increase in sales was observed during pre-Diwali period , reflecting seasonal demand spikes. Dry fruits including almonds have emerged as top performing SKU ,contributing highest revenue . Bansal Kirana Store is especially know for the dry fruits in the Area. This highlights the importance of prioritizing such as high margin , fast moving items in inventory

Descriptive Statistics and Visualization were created to understand the data better

- Revenue trends clearly show frequent increase in sales before Diwali period for high value items like dry fruits and also for other items
- Line and Bar charts illustrate the consistent demand for top performing SKUs

The Analysis also uncovered inefficiencies , such as overstocking of low demand items and inconsistent pricing strategy for mid revenue SKUs . By standardizing pricing and focusing on top products , the store can reduce inventory holding cost while increasing profitability.

2 Proof of originality of the Data

1. **Link for the images with Business Unit :**
   https://drive.google.com/file/d/15QynrsxE0h4fvGVTTjNCWxTyk65Ap-4v/view?usp=sharing
   https://drive.google.com/file/d/15Zz0ztnA7i3yXKqLN3ueDwpyGwMb4N5j/view?usp=sharing

2.Link of Video Interaction With Business Owner

https://drive.google.com/file/d/1wPTpJZhq6XXTRsY9vjMcB

oH3qbPxWPUQ/view?usp=sharing

3.Letter from the Owner:

https://docs.google.com/document/d/1JkbHJwRpTZnkW9v4Jv28trKcDcPKbTmS/edit?usp=sharing&ouid=116341856459875832737&rtpof=true&sd=true

3 Metadata

- **Sales in October-November :** The owner shared the information of sales and prices of the SKU
- **Dataset Structure :**

  Number of rows : 551

  Number of columns : 6 (SKU, date, unit, price ,quantity ,revenue)
- **Datasheet :** This sheet present the inventory list of top 10 selling SKUs derived from initial conversation with owner
- **Sales Data**

Key	**Description**
SKU	Name of the item
Date	Date at which it was sold
Unit	Packet or kilo
Price	Price of one Packet or Kilo
Quantity	How much customer has taken
Revenue	Price multiplied by Quantity

- Pricing data

Key	**Description**
SKU	Name of item
Cost Price (On average of single unit)	Cost Price of Product
Selling Price	Selling Price of Product
Profit on Single Unit	Profit margin in rupees

4 Descriptive Statistics

After data preprocessing the following is the descriptive statistics for sales data

Descriptive Statistics Measure	**Definition**
Sum	Total Value
Mean	Average value
Median	The middle value in when sorted
Standard Deviation	The measure of spread
Minimum	Smallest Value
Maximum	Largest Value

For overall Sales

Descriptive Statistics Measure	Quantity	Revenue
Sum	9205	884850
Mean	16	1608
Median	17	650
Standard Deviation	7.5	2983
Minimum	5	100
Maximum	29	16800

- The entire Sales have been organized into 10 majorly sold SKU for analysis purpose . These SKUs are
  1. Aata - The Aata Packet of wheat is product is the shop which is mainly used by the mess persons
  2. Dry Fruits – Consisting of almonds, cashew , khajur
  3. Bajri – A Cereal
  4. Besan – Besan is powder like which is used for various purpose
  5. Biscuits – Cookies in packet
  6. Soap – A detergent used for cleaning clothes , utensils
  7. Soyabean – Soyabean is also cereal used in food

8. Sugar – Sugar is used in tea and other products
9. Toothpaste – Used for cleaning teeth
10. Wheat - A Cereal

SKU	No of Sales	Revenue generated
Aata	861	34440
Dry Fruits	880	528000
Bajri	934	46700
Besan	952	57120
Biscuit	970	29100
Soap	979	24475
Soyabean	928	74240
Sugar	959	43155
Toothpaste	890	17800
Wheat	852	29820

5 Detailed Explanation of Analysis Process & Methods

The analysis was conducted with the objective of identifying key revenue trends, determining top-performing SKUs, and uncovering patterns to optimize inventory and pricing strategies. The dataset used contains 35 SKUs, daily sales data, cost price, selling price, profit margins, and revenue generated over a two-month period. The key metrics analyzed were total revenue, SKU-wise performance, and overall profit contribution.

1. Data Preparation:

The dataset was first cleaned and formatted for consistency. Columns for cost price, selling price, and profit margins were calculated to ensure accurate revenue evaluation. For each SKU, revenue was derived by multiplying units sold by the selling price. This dataset was further aggregated at different levels, such as SKU-level and daily totals, to provide deeper insights.

2. Revenue Analysis:

Total revenue for each SKU was calculated and ranked to identify top-performing items. A Pareto chart was generated to visualize how revenue is distributed among SKUs, demonstrating the 80-20 rule: a significant portion of revenue is contributed by a few high-performing SKUs, such as dry fruits and staples like wheat and rice.

3. Sales Trend Analysis:

Line charts were plotted to observe sales trends over the analysis period. These trends highlighted seasonal effects, such as increased sales of dry fruits and festive items around Diwali. This step was crucial for understanding demand variability and aligning inventory planning with consumer behavior.

4. Top SKU Performance:

A bar chart showcasing the top 10 revenue-generating SKUs was created, emphasizing the disproportionate contribution of certain items like dry fruits, wheat, and sugar. This analysis aids in identifying high-margin products to focus marketing and inventory strategies.

5. Profitability Analysis:

Profit margins were analyzed for each SKU to identify the most profitable items. The findings indicated inefficiencies, such as inconsistent pricing for high-demand items and overstocking of low-turnover products.

6 Results and Findings

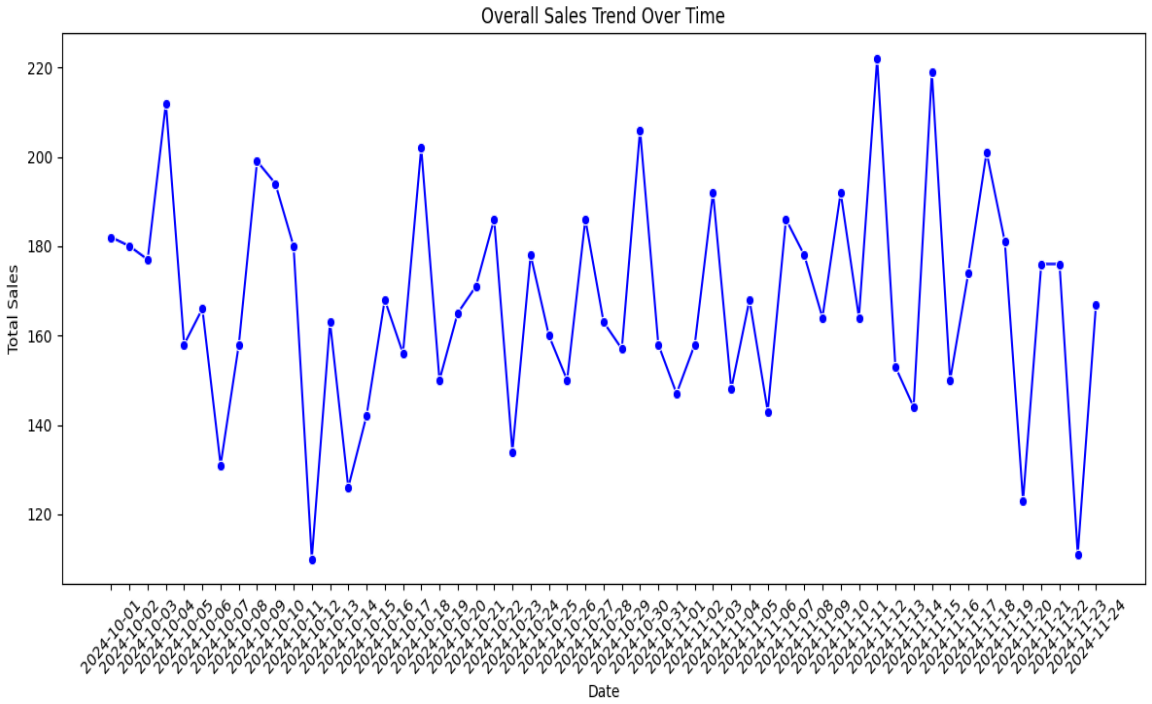

Fig 1.1

The overall revenue chart provides a comprehensive view of the total revenue generated over the analyzed period. It reflects the store's sales performance trends and serves as a foundation for identifying critical periods of higher or lower sales activity

Chart Details:

The chart is a line graph, where:

The x-axis represents the time period.

The y-axis represents total revenue in INR.

Observations:

Revenue Trends Over Time:

- The chart shows consistent revenue generation across most periods with notable spikes in revenue during late October leading into early November, attributed to the festive season (Diwali). This indicates a seasonal demand boost, especially for high-demand items like dry fruits and aata.
- A gradual decline is seen post-festive season, which aligns with reduced consumer spending.

Insights for Strategic Planning:

- High-revenue periods provide an opportunity to stock up on high-demand SKUs while minimizing low-performing inventory.

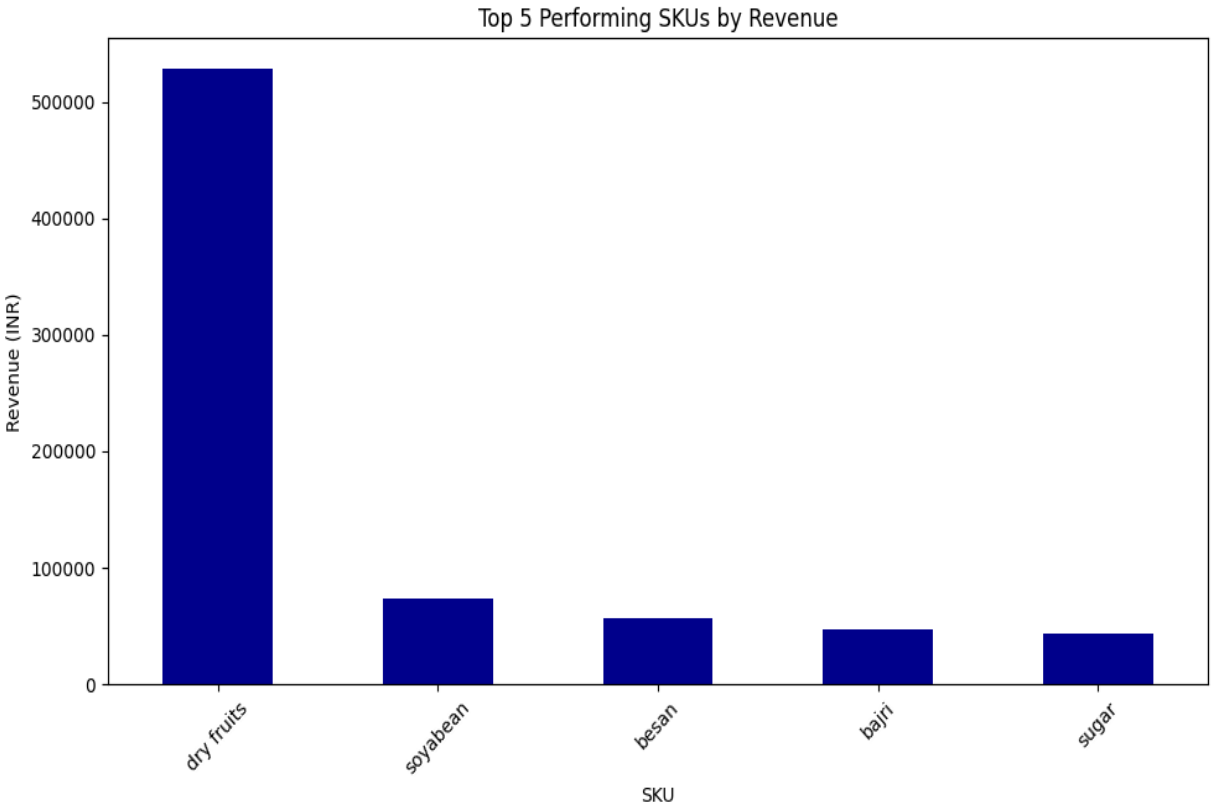

Fig 1.2

The high-performing stock chart highlights the products contributing significantly to the store's profitability. This bar chart is sorted by total revenue contribution for each SKU, making it easy to identify which products drive overall revenue.

Observations:

Top Performers:

- Dry fruits and aata dominate, contributing the largest share to revenue. This suggests these items are either consistently in demand or have higher margins due to their premium nature.

Actionable Insights:

- Prioritize stocking high-performing items during both peak and off-peak seasons to ensure steady revenue**.**

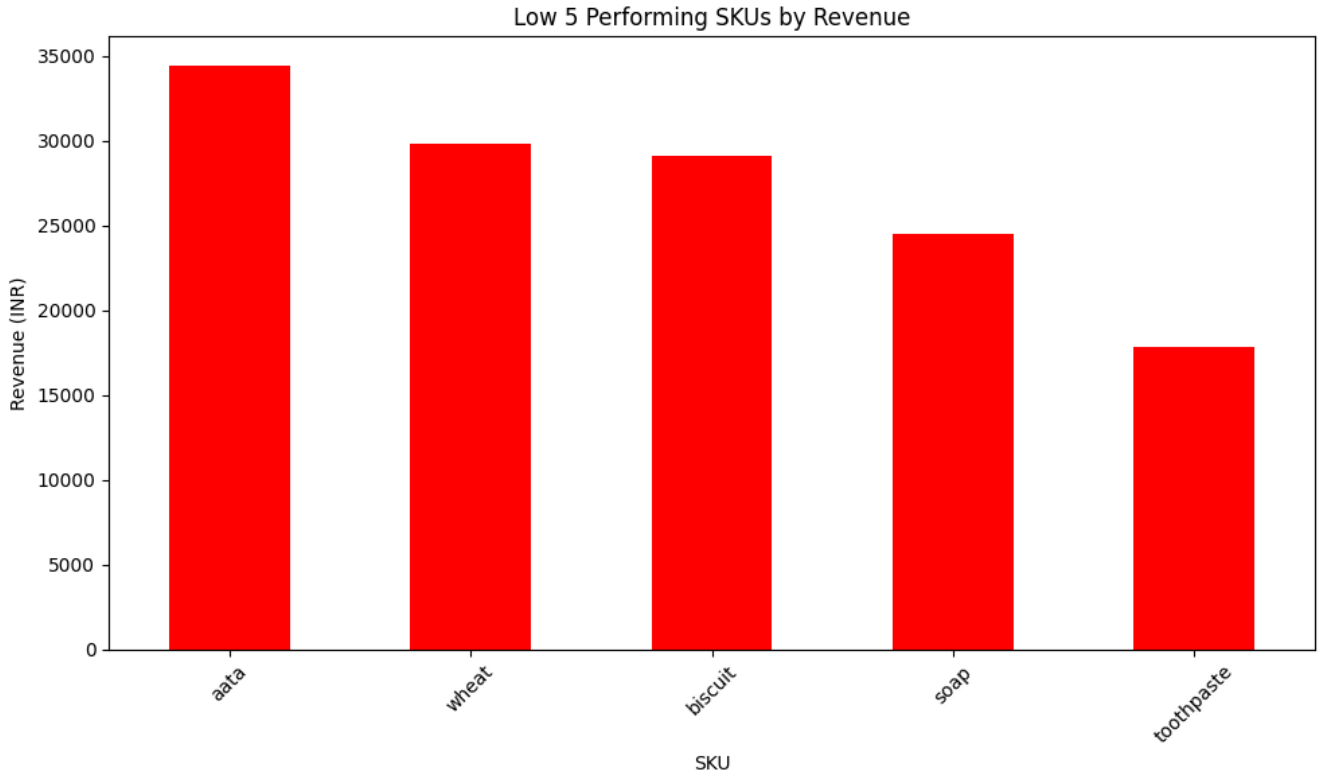

Fig 1.3

The low-performing stock chart illustrates products with minimal revenue contribution. This **bar chart** enables a focused assessment of items that may need inventory adjustments or discontinuation.