Smarter Sales & Stock Control for Shivam Book Depot & Stationery Shop

Midterm report for the BDM Capstone Project IIT Madras

Submitted by

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1. Executive Summary

This midterm report focuses on improving the sales and inventory system of Shivam Book Depot & Stationery Shop, a small shop located in Vixxxxxxa Colony, India. The shop has been serving students and working professionals since 2020, offering a different variety of stationery items like notebooks, pens, chart paper and more.

After talking to the shop owner and going through the records, two major problems were identified. First, the shop often buys too much of certain items that do not sell quickly, which blocks money and takes up storage space. Second, during peak seasons like school admissions or exams, important items go out of stock, and customers must go elsewhere.

To solve these problems, I am using Excel tools like Pivot Tables, bar charts, and line graphs to study the past sales and understanding what sells when. This will help the shop prepare better for busy items and avoid overstocking slow-moving items. I am also using Pareto Analysis to find out which few products bring in most of the sales.

So far, the shop owner has shared useful sales data, and analysis has started showing some patterns. In the next phase, I will suggest practical steps for keeping the right stock at the right time. This project aims to help the shop save money, manage stock better, and keep customers happy.

2. Proof of Originality

The data used in this project is original and collected directly from Shivam Book Depot & Stationery Shop through personal interaction with the shop owner. Since the shop does not any advanced software for record-keeping, most of the sales data was maintained in handwritten notebooks. I collect data from June-2024 to May-2025.

The shop owner usually shares this data with his accountant, who manages the records using Tally. At my request owner share the relevant data. Wherever possible, the data was exported from Tally to Excel to make the analysis easier.

Below are the pictures that showing shop interior, front view, and stationery items on display.

Figure 1

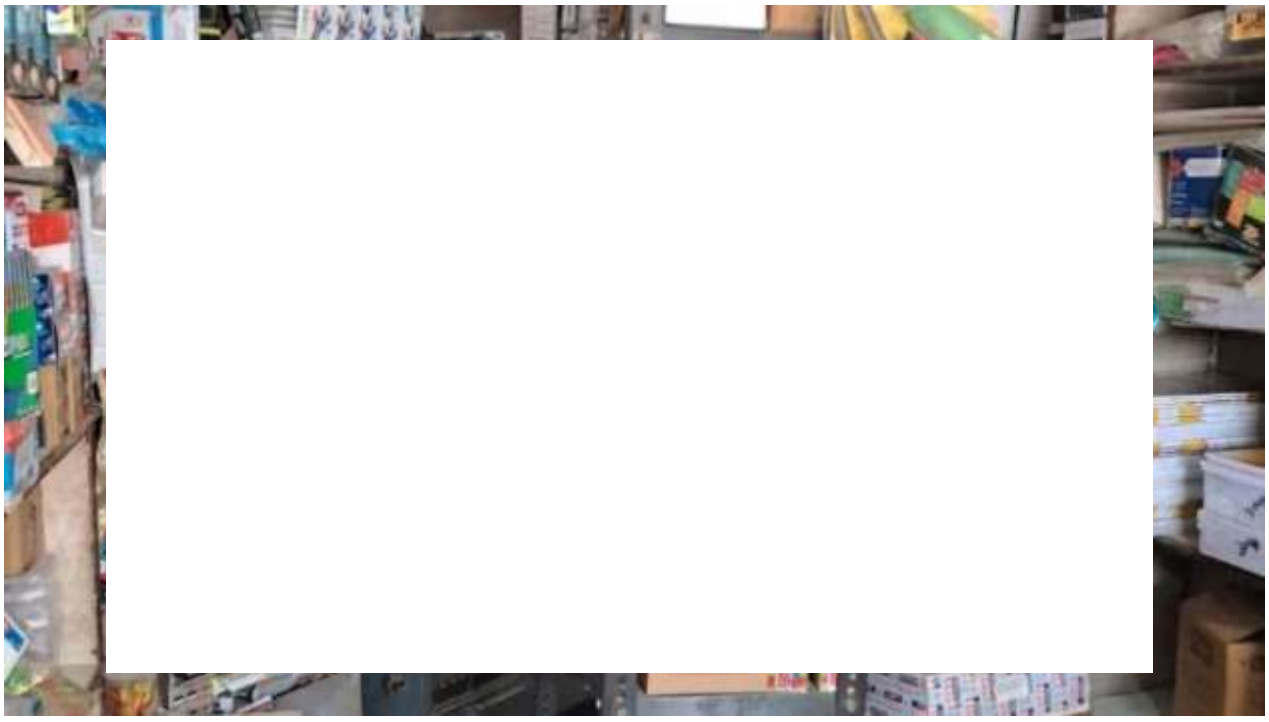

Figure 2

Proof Link: Originality Proof

3. Metadata

Dataset Link: Dataset

This project is based on the analysis of data collected from Shivam Book Depot & Stationery Shop, a local retail business located in Vixxxxxxa Colony, India. The data has been manually entered in Excel based on discussions with the shop owner, and physical registers. The Primary focus is to understand item-wise sales trends, seasonal demand changes, and stock flow across a 12 months period.

Dataset Dimensions

- Sales_Data: 21 Columns and 14 Rows.
- Revenue_Data: 21 Columns and 14 Rows.
- Inventory_Data: 21 Columns and 49 Rows.

The Excel contains multiple sheets that represents key business operations and inventory management details:

1. Sales_Data:
    - Contains items-wise monthly sales quantities from June 2024 to May 2025.
    - Columns: Item Name, Rate (INR), Jun-24, Jul-24, Aug-24, Sep-24, Oct-24, Nov-24, Dec-24, Jan-25, Feb-25, Mar-25, Apr-25, May-25
    - Rows (Item Name): Classmate Notebook, Pen, Pencil, Geometry Box, Eraser, Highlighter, File Folder, Stapler, Chart Paper, Marker, Water Colour, A4 Paper, Glue Stick, Sticky Notes, Whiteboard Marker, Sharpener, Binder Clip, Document Envelope, Scissors, Correction Pen
    - This sheet helps in identifying high demand items and periods of peak sales activity.
2. Revenue_Data:
    - Shows monthly revenue per item and total revenue across months.
    - Columns: Item Name, Rate (INR), Jun-24, Jul-24, Aug-24, Sep-24, Oct-24, Nov-24, Dec-24, Jan-25, Feb-25, Mar-25, Apr-25, May-25
    - Rows (Item Name): Classmate Notebook, Pen, Pencil, Geometry Box, Eraser, Highlighter, File Folder, Stapler, Chart Paper, Marker, Water Colour, A4 Paper, Glue Stick, Sticky Notes, Whiteboard Marker, Sharpener, Binder Clip, Document Envelope, Scissors, Correction Pen

- Useful for evaluating which products contribute most to income.

3. Inventory_Data:
    - It includes opening stock, purchase, sales and closing stock for each month.
    - Columns: Item Name, Jun-24 Opening, Jun-24 Purchase, Jun-24 Sales, Jun-24 Closing, Jul-24 Opening, Jul-24 Purchase, Jul-24 Sales, Jul-24 Closing, Aug-24 Opening, Aug-24 Purchase, Aug-24 Sales , Aug-24 Closing, Sep-24 Opening, Sep-24 Purchase, Sep-24 Sales, Sep-24 Closing, Oct-24 Opening, Oct-24 Purchase, Oct-24 Sales, Oct-24 Closing, Nov-24 Opening, Nov-24 Purchase, Nov-24 Sales, Nov-24 Closing, Dec-24 Opening, Dec-24 Purchase, Dec-24 Sales, Dec-24 Closing, Jan-25 Opening, Jan-25 Purchase, Jan-25 Sales, Jan-25 Closing, Feb-25 Opening, Feb-25 Purchase, Feb-25 Sales, Feb-25 Closing, Mar-25 Opening, Mar-25 Purchase, Mar-25 Sales, Mar-25 Closing, Apr-25 Opening, Apr-25 Purchase, Apr-25 Sales, Apr-25 Closing, May-25 Opening, May-25 Purchase, May-25 Sales, May-25 Closing
    - Rows (Item Name): Classmate Notebook, Pen, Pencil, Geometry Box, Eraser, Highlighter, File Folder, Stapler, Chart Paper, Marker, Water Colour, A4 Paper, Glue Stick, Sticky Notes, Whiteboard Marker, Sharpener, Binder Clip, Document Envelope, Scissors, Correction Pen

The objective of this project is to explore monthly sales and inventory patterns to help solve business problems faced by the shop. These include:

- Managing seasonal spikes in demand during school admission and exam seasons.
- Avoiding over purchasing of slow-moving items.
- Improving cash flow by aligning stock with actual demand.\

3.1. Descriptive Statistics

Descriptive Statistics are used to understand the main patterns in the monthly sales data of Shivam Book Depot & Stationery Shop. These statistics provide key figures such as average sales, highest and lowest monthly values, and the overall spread of sales, helping us interpret hoe customer demand varies across time and products.

Statistic	Value
Mean Sales	44.17 units
Median Sales	40.00 units
Maximum Sales	100 units
Minimum Sale	10 units
Range (Max-Min)	90 units
Standard Deviation	20.81 units
Variance	433.33

Table 1

The above table summarizes the monthly sales data of all stationery items sold at Shivam Book Depot & Stationery Shop over 12 months period. The average sales per item per month was 44.17 units, while the median value was 40 units, showing that half of the monthly items sales were above this level.

The highest number of sales recorded in a single month was 100 units, whereas the lowest was 10 units, leading to a sales range of 90 units. This wide range reflects the seasonal demand variation across items.

The Standard deviation of monthly sales was 20.81 units, indicating a moderate degree of fluctuation in item demand. The variance of 433.22 gives us an idea of the overall dispersion in the dataset.

Item Name	Total Sales	Avg Sales	Median	Max	Min	Range	Std Dev	Variance
Pen	848	70.67	67.0	99	44	55	19.23	369.70
Geometry Box	815	67.92	62.0	95	45	50	20.00	399.90
Pencil	814	67.83	65.5	93	40	53	16.67	277.79
Eraser	806	67.17	67.0	100	42	58	19.04	362.52

Table 2 (Top 5 items)

- **Pens** and **Erasers** had high total and average sales but also high variability, showing they are in demand but fluctuate seasonally.
- **Classmate Notebooks** showed consistent sales with relatively lower variability, suggesting stable year-round demand.
- **Geometry Boxes** showed a wide range from 45 to 95 units useful for planning stock in exam seasons.

4. Methods of Analysis with Justification

4.1. Data Entry, Cleaning, and Structuring

- **Process:**

  The monthly sales and purchase data of Shivam Book Depot & Stationary Shop was entered into Excel manually. Errors like missing items names, repeated entries, and inconsistent spellings were corrected. The data was arranged neatly, with columns for item name, monthly sales, purchases, and stock levels.

- **Justification:**

  Cleaning the data ensured that calculations were accurate. Organizing it clearly helped in making the analysis process smooth and reliable. For a small local shop, having clean and structured data makes a big difference in decision making.

4.2. Descriptive Statistics

- **Process:**

  Basic statistics such as average, median, max sales, min sales, standard deviation, and variance were calculated for monthly sales and top 5 items.

- **Justification:**

  These figures helped identify which products were in regular demand like pens and notebooks and which ones had unpredictable sales like staplers or scissors. It allowed the shop to stock smarter and avoid waste.

4.3. Sales Trend Analysis

- **Process:**

  Line graphs were used to observe sales patterns across months. Demand was clearly higher during school opening months and exam season (Jan-March).

- **Justification:**

  Seeing these patterns helped identify when to prepare for high demand. It also helped prevent over purchasing in low seasons which saves space and money.

4.4. Product Priority (ABC -like Categorization)

- **Process:**

  Items were informally ranked by their total yearly sales into high, medium, and low priority groups

- **Justification:**

  This helped focus stock and shelf space on fast-moving items while limiting slow sellers. It is useful for shop with limited space and budget.

4.5. Correlation Between Sales and Purchase

- **Process:**

  Excel CORREL function was used to find the relationship between monthly purchases and sales.

- **Justification:**

  A positive correlation showed that purchasing in advance especially during peak months helped boost sales. This highlights the importance of proper planning.

5. Result and Findings

1. **<u>Sales Trend Analysis</u>**

   The monthly sales trend chart (**Figure 3)** highlights the changing pattern of demand over the academic year. Items like Classmate Notebook, Pens, Pencils, Geometry Boxes, and Erasers show sharp peaks during June, July, January, and February, which aligns with the beginning of school terms and the exam season. These months reflects periods when parents and students are actively purchasing essential study materials. Conversely, April and December mark noticeable dips in sales. This trend can help the store to manage inventory levels, focusing on restocking before high-demand months while avoiding excess purchases during slow periods.

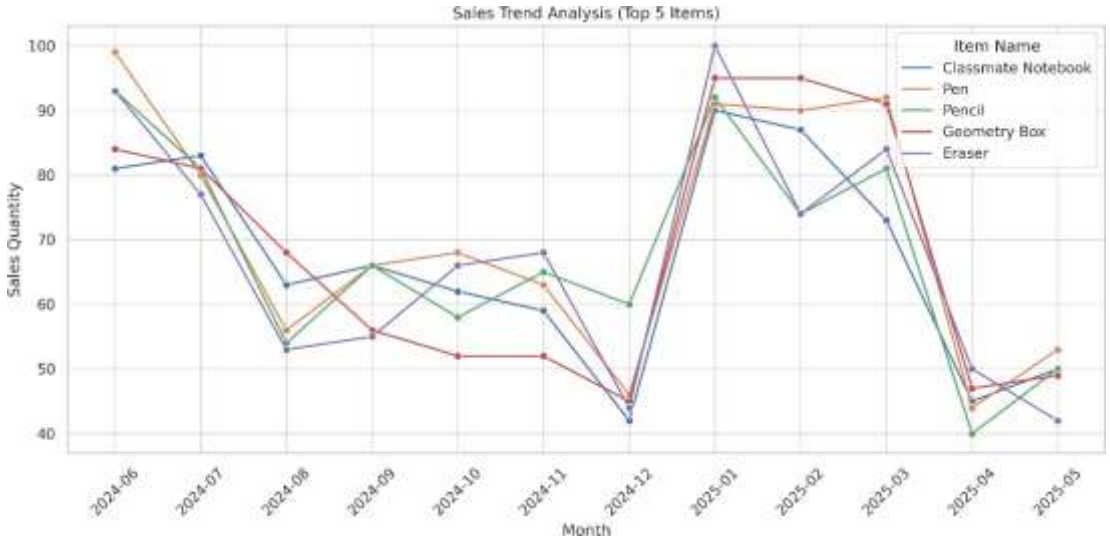

Figure 3: *Line chart showing monthly sales trend of top 4 items*

2. Sales Pareto Analysis

The Sales Pareto Chart (**Figure 4**) shows that a few items account for a large portion of the overall sales. Pens, Geometry Boxes, Pencils, Erasers, and Notebooks together contribute to nearly 80% of total sales volume. This confirms the 80/20 rule, where a small group of products brings in the majority of revenue. These high demands items allow Shivam Book Depot & Stationery to focus on keeping their stock levels consistent, ensuring they are never out of the stock.

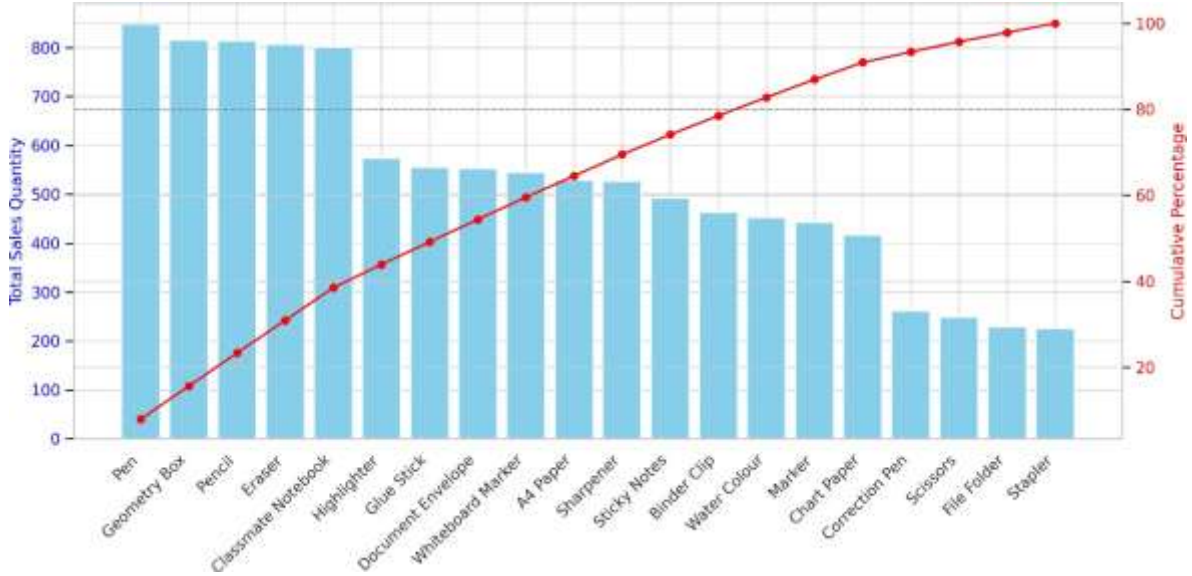

Figure 4: *Sales Pareto Chart – Cumulative sales V/S Items*

3. Purchase Pareto Analysis

The Purchase Pareto Chart (**Figure 5**) display a pattern in purchase behavior. Products such as Pens, Pencils, Erasers, Geometry Boxes, and Classmate Notebooks make up the bulk of the purchases. The shop purchasing is aligned with actual sales trends, which reflect a good purchasing strategy. However, some items with lower sales still appear in high purchase quantities, which might lead to overstocking.

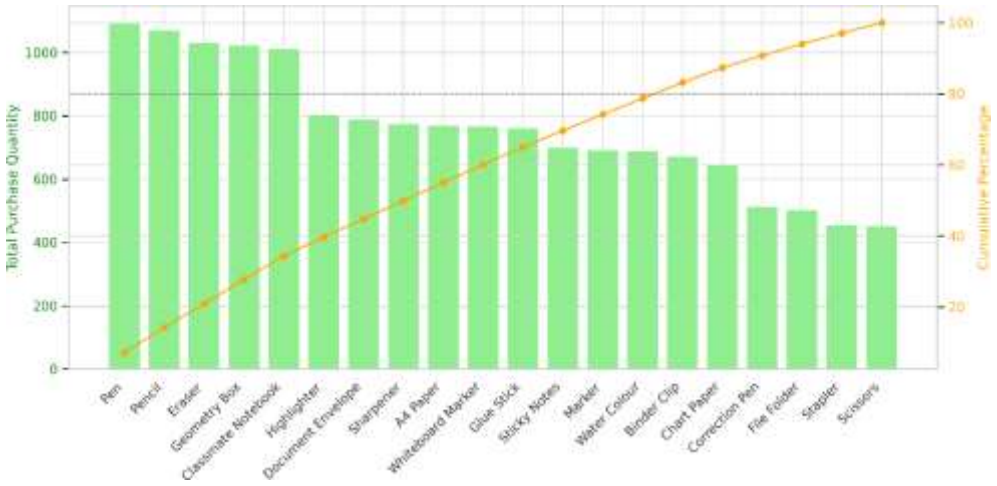

Figure 5: *Purchase Pareto Chart – Cumulative purchase V/S Items*

4. Correlation Between Sales and Purchases

A correlation analysis highlights a relationship between sales and purchase quantities. The results showed a strong positive correlation coefficient of 0.9954, that mean when the shop bought more stock especially in busy months sales also increased. This highlights the importance of smart and timely purchasing to keep up with customer demand and boost overall sales. However few outliers were noticeable. Items like File Folder, Scissors were purchased in large quantities but showed lower sales.

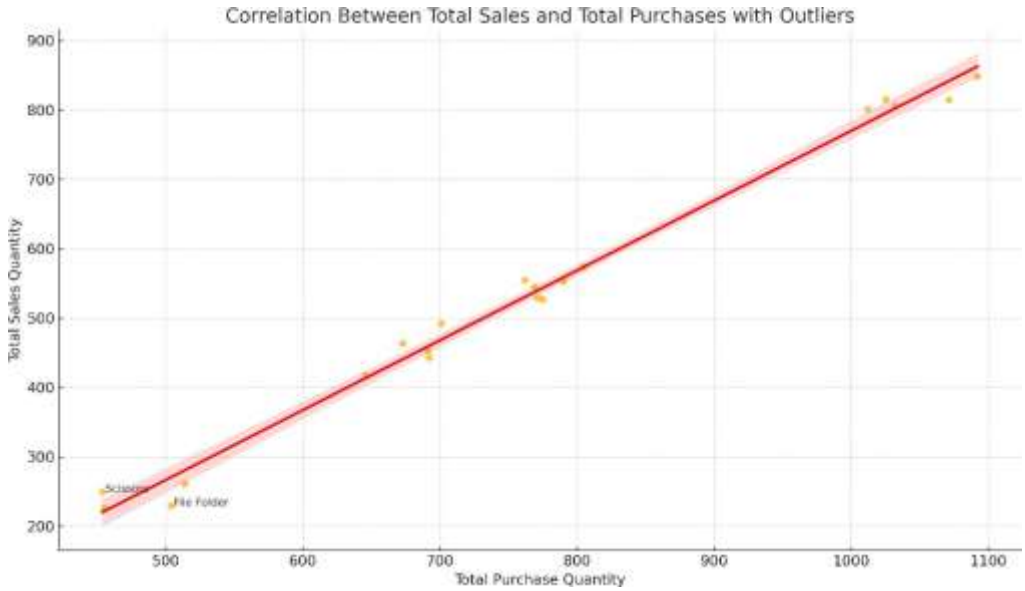

Figure 6: *Correlation Chart between Sales and Purchase*