Data-Driven Operational Strategies for Sustainable Growth in Local Kirana Retail

Mid Term report for the BDM capstone Project

Submitted by

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1 Executive Summary

Shree Samarth Food Mall is a local grocery store in Kandivali East, Mumbai, which mainly serves the residents of Arya Chanakya Nagar and Kalpataru Towers. The store was established in 2019 by the partners Mr. Anand Damle and Mr. Kalpesh Amre, and it operated efficiently during its first couple of years. However, the store has been encountering significant challenges in its operations recently. These challenges are a little customer demand, high inventory wastage, particularly in the dairy and bakery sections (milk, curd, bread, and butter), and a large amount of working capital being tied up in slow, moving FMCG stock. The profitability of the store has become inconsistent, and there is no proper tracking or control structure for the informal credit given to the regular customers.

We took operational data from September, October and Start of November 2025 for this mid, term analysis. We compiled and cleaned the data and converted the raw sales and purchase entries into organized spreadsheets suitable for analysis. Our descriptive assessment was primarily concerned with sales behaviour by category, perishable wastage, product, level margins, and the volume of credit transactions. The first results show that the store experiences significant fluctuations in daily sales, is overstocking low, turnover items, is repeatedly wasting dairy products due to inaccurate demand forecasting, and that customer repayments are delayed. These revelations will help the team to conduct their final analysis at a deeper level using forecasting models, ABC classification, margin optimization, and credit, risk evaluation frameworks.

2 Proof Of Originality

Business Name: Shree Samarth Food Mall
Address: Kandivali East, Mumbai
Owners: Mr. Anand Damle and Mr. Kalpesh Amre
Letter:

Shree Samarth Food Mall

Aarya Chanakya Nagar, Kandivali East,
Mumbai, Maharashtra 400101

Mobile:92208 00846

TO WHOMSOEVER IT MAY CONCERN

This is to certify that I, Mr Kalpesh Amre , owner of shree samarth food mall , have provided the sales and purchase data from 17th September to 17th December 2025 to Shashank Kulkarni for the purpose of an academic project on business data management at IIT Madras.

The data provided by me is true and correct to the best of my knowledge and is to be used solely for academic purposes.

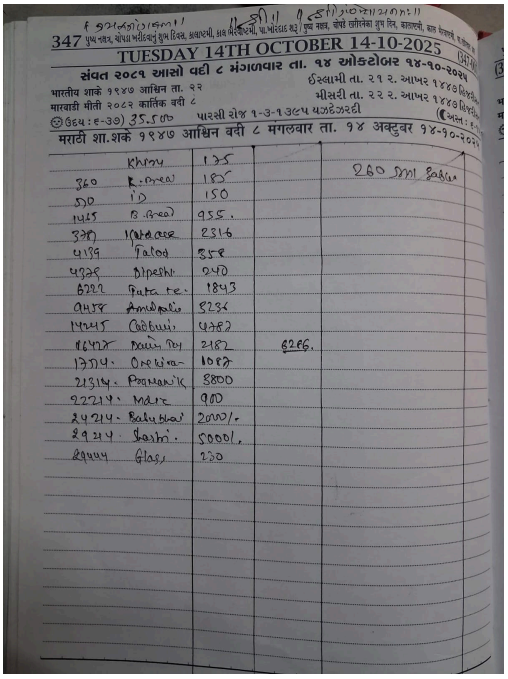
Sign
Mr. Kalpesh Amre
Owner of Shree Samarth Food mall

Video of the interaction with the owner:https://youtu.be/AHBI10yNyWU

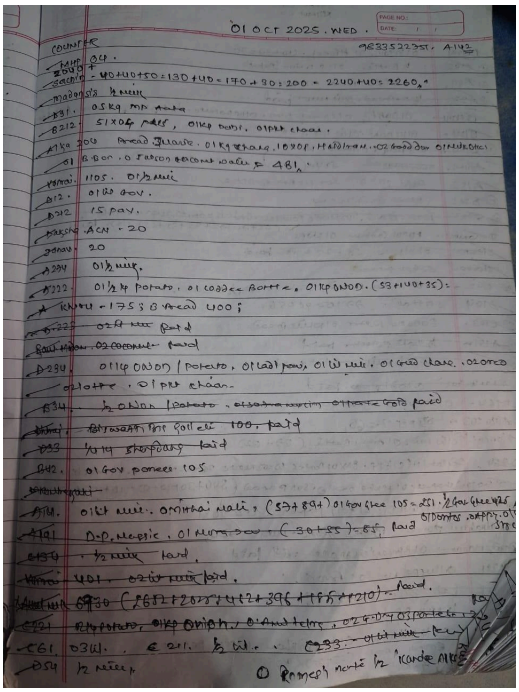
Photo of the shop: 

The business owner utilises three primary methods for Recording Data:

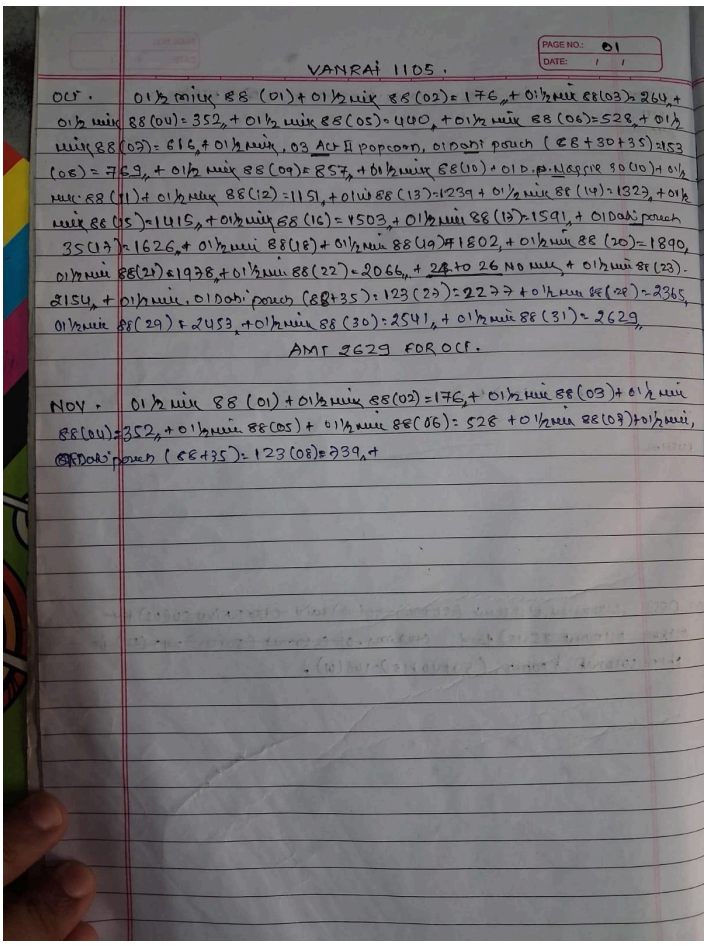
1]A Laxmi Notebook:To store the the intake of inventory from various companies organised by the company name and amount the total intake each day is summed and written on top of the page



2]Daily Sales Over the Counter:



3]Credit Customer Records:



3 METADATA

Data Format: CSV and Excel / Google Sheets (XLSX)

Range: September 1 – October 15 2025

Business Closed: Closed every Sunday and on September 15 (holiday).

Units of Measurement: Indian Rupee (₹) for all financial features.

Data Source: Daily sales, purchase, and credit records collected from the owner of *Shree Samarth Food Mall*.

Information about the Item Sales Data

The sales data were divided into different product groups that were sold in the store.
For each category, the following features were recorded and analyzed:
Category: The product group or the class to which the item belongs (e.g., Bakery, Dairy, Snacks, Staples, etc.).

- Total Revenue (₹): The total sales value resulting from all items within that category.
- Total Profit (₹): The total profit obtained by deducting from the selling price the purchase cost and then summing up all the items in that category.

Explanation:
Product categories have different impacts on revenue and profit of the store.

For instance:

1. Staples and Dairy usually have higher total revenue since these products are bought regularly by households for daily consumption.
2. Snacks and Personal Care products may have less revenue but usually, they have more significant profit margins per unit.
3. Vegetables, on the other hand, are somewhere in between regarding revenue and profit, which suggests that they are normal purchases, but margins may be low because of perishability.
4. Items such as Beverages and Household products show relatively smaller contributions to revenue, maybe because of lower turnover frequency.

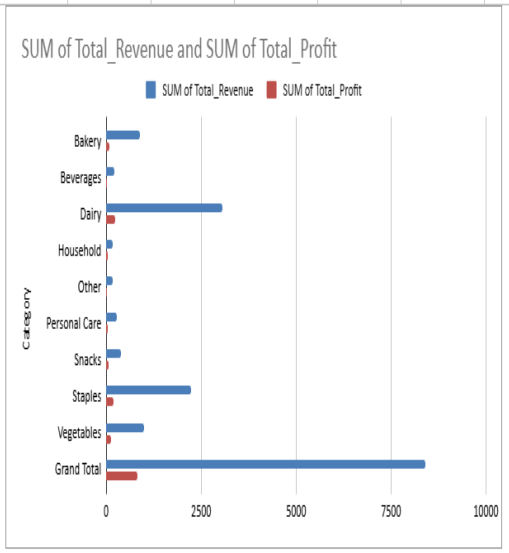
In order to compare visually the performance of each category, a bar chart was drawn displaying:

- Total Revenue (blue bars)
- Total Profit (red bars)

Such a visualization makes it very clear which categories are the ones that have high sales volume and which ones are the ones that yield better profitability, thus assisting the store owner in making purchasing and stock management decisions that are more informed.

Sum of Total_Revenue and sum of total profit:

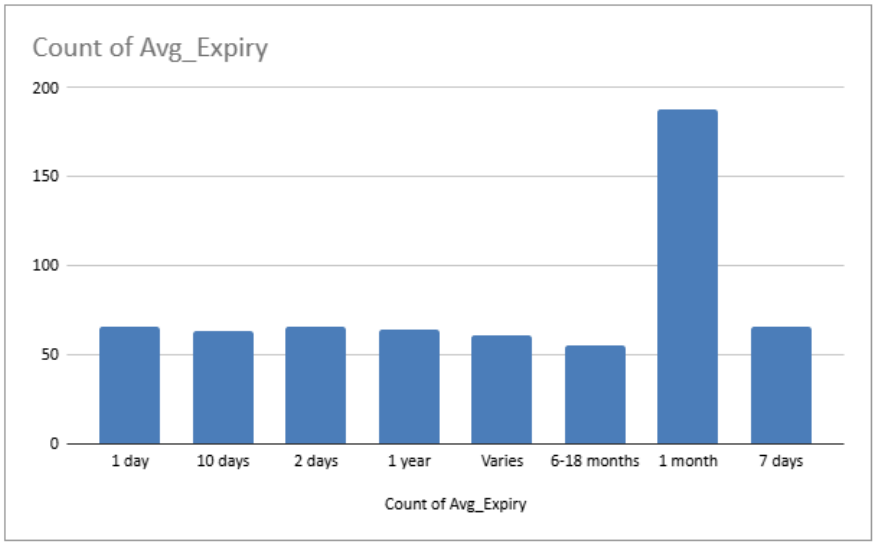
Category	SUM of Total_Revenue	SUM of Total_Profit
Bakery	881	93
Beverages	208	27
Dairy	3066	232
Household	179	33
Other	172	26
Personal Care	282	32
Snacks	396	71
Staples	2243	187
Vegetables	988	123
Grand Total	**8415**	**824**



- Information about the Average Expiry Data

Average expected expiry duration for each item in the store was determined from package information or supplier guidance.
Features Collected for Each Item:
Item Name: The name of the product.
Category: Product category that the item belongs to (e.g., Dairy, Snacks, Staples, etc.).
Average Expiry Duration: The normal time after which the item is expected to expire or lose its quality (e.g., 1 day, 7 days, 1 month, 1 year).
Explanation:
Every product available in the store is differently shelf, lived.
Products like bread, milk, and fresh snacks usually have a very short expiry duration, while staples and packaged groceries normally a have longer expiry period.
Stores equipped with expiry distribution information could help the owner rotate the stock, plan the frequency of purchasing, and even determine the discount strategy to avoid wastage.
The bar chart above breaks down the number of the products based on the average expiry period of the products.
It actually shows that:
The highest number of products is covered by the “1 month” expiry category. It generally refers to packaged staples, snacks, and daily, use items.
Several products are found to have a very short shelf life including:
1 day ⟶ Fresh bakery and dairy items
7, 10 days ⟶ Perishable snacks and ready, to, eat foods
Almost no products are of long shelf life such as 1 year or more, mainly bulk staples or sealed household goods.
This expiry analysis is essential because it aids in the following:

- Prevent stock from spoiling and thus losing money
- Decide restocking intervals
- Identifying which products need to be cleared or discounted more rapidly
- Planning inventory in smaller or larger quantities depending on whether products are perishable or not



Information about the Intake Inventory Data

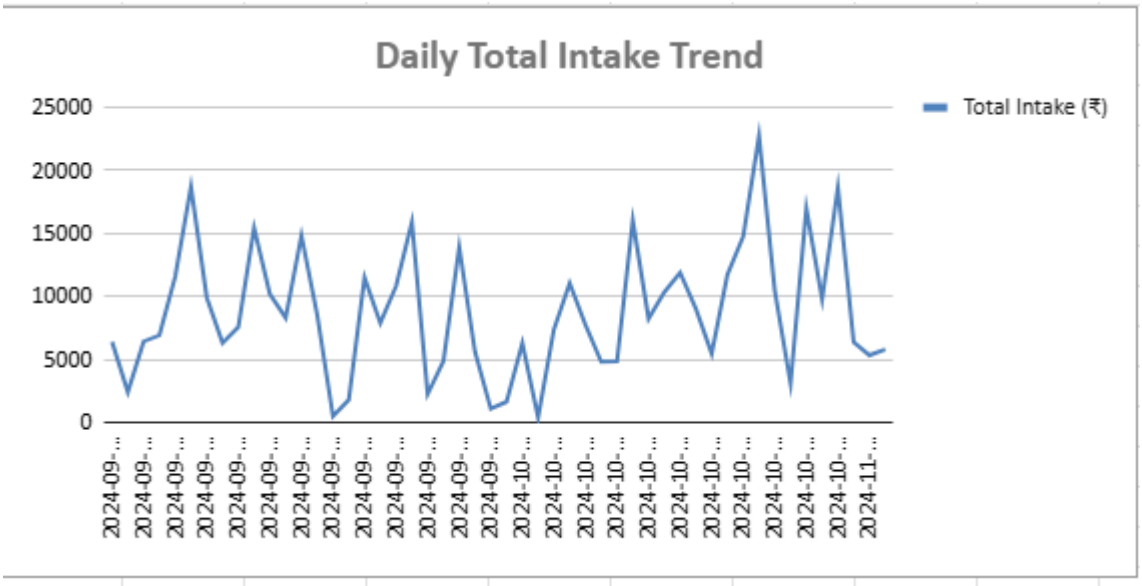
This line graph illustrates changes in Total Intake (₹) that is the money spent on stocks for each day during the period shown.
Explanation:
The money that is spent on buying goods changes every day, which reflects changes in:

- Stock demand
- Sales volume
- Number of customers
- Seasonal requirements
- Weekly restocking patterns

There are some days, which have higher purchase volumes, and thus, indicate:

- Bulk restocking
- Getting ready for the expected high sales (for instance, weekends / the beginning of months
- Supplier delivery schedules

On the other hand, days with low or zero purchases are accompanied by:
Enough stock already in the store,Lower demand,Planned downtime or slow business cycles
This movement allows the retailer to grasp how cash flow is changes and he can use it to plan procurement so that he doesn't have either too much stock or run out of stock.



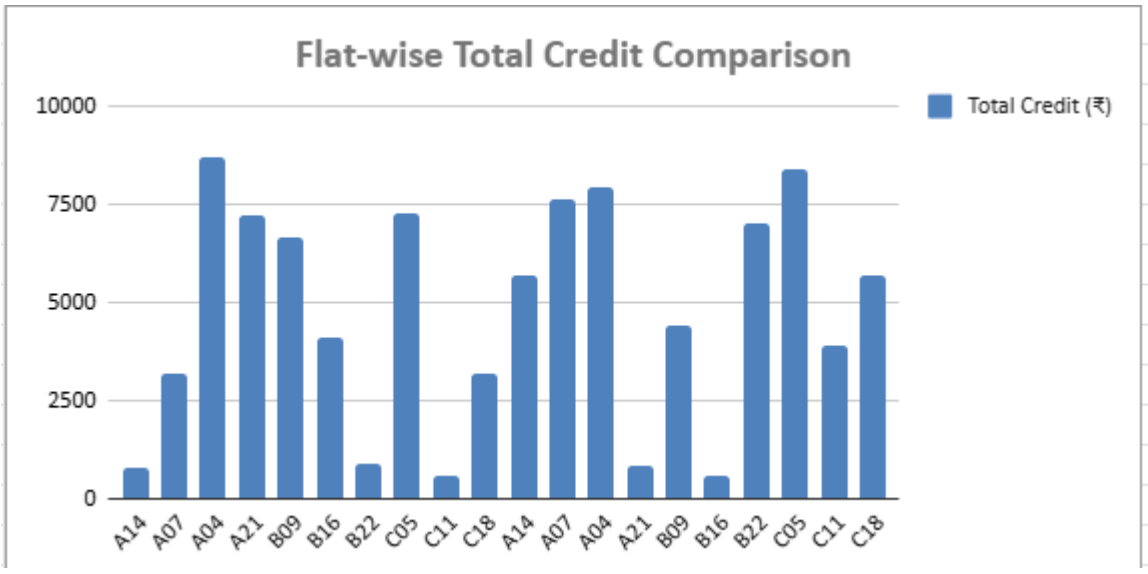
Flat, wise Total Credit Comparison

The above bar chart displays the total credit that was given to each household/flat over the chosen months. Each bar depicts the value of goods that were taken on credit by a particular flat, without considering the number or type of items purchased.Explanation:Credit usage in different flats is the main focus of the chart. Some flats have shown that credit values are very high all the time, thus, it can be concluded that they have either made frequent purchases on credit or have a greater household consumption. As an example, total credit amounts of flats like A07, B09, and C05 (just a hypothetical example from your chart) have increased, which leads to the conclusion that these households either consume more goods monthly or are more dependent on the credit facility.On the other hand, there are households like A04 and C18 whose total credit values are low, illustrating that credit usage in these homes is limited or that repayments are more frequent. This difference is a clear indication of consumption patterns, payment discipline, and store credit reliance in various houses.

Why This Matters for the Business:

- The store owner gets the following advantages from this flat, wise comparison:
- Finding out those customers who have a high credit balance and might need a follow, up for repayment
- Noticing the reliable payers who regularly settle their dues
- Getting a clearer picture of the families that pose credit risks the most
- Making well, informed decisions regarding the issuing, extending, or limiting of credit

The business can keep a steady flow of cash, lower the amount of money that is owed to them, and more easily get back their credit if they follow such trends on a regular basis.



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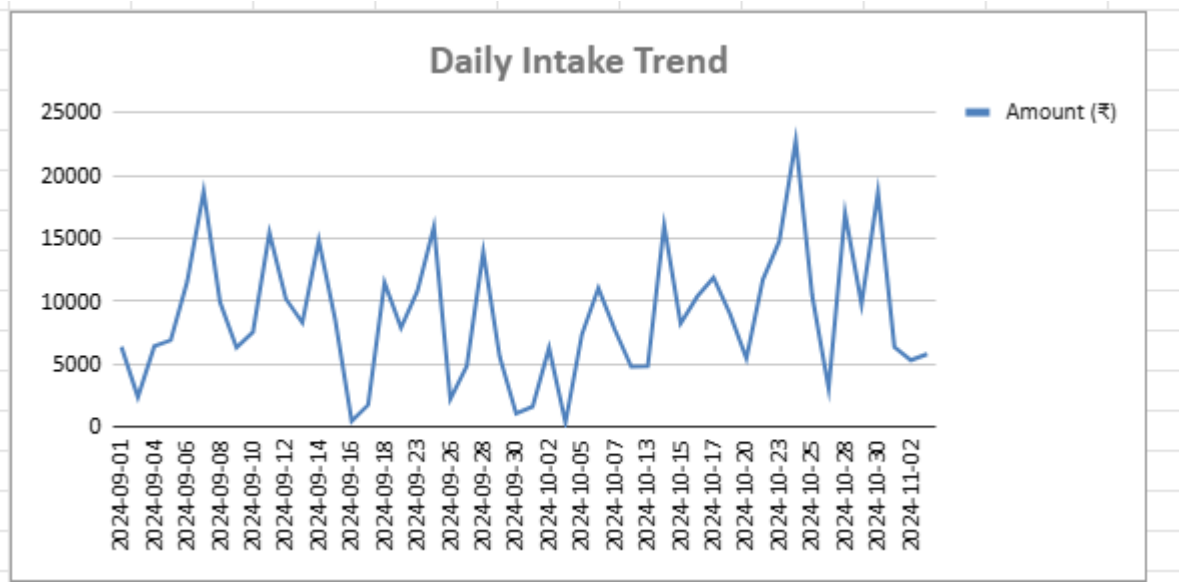
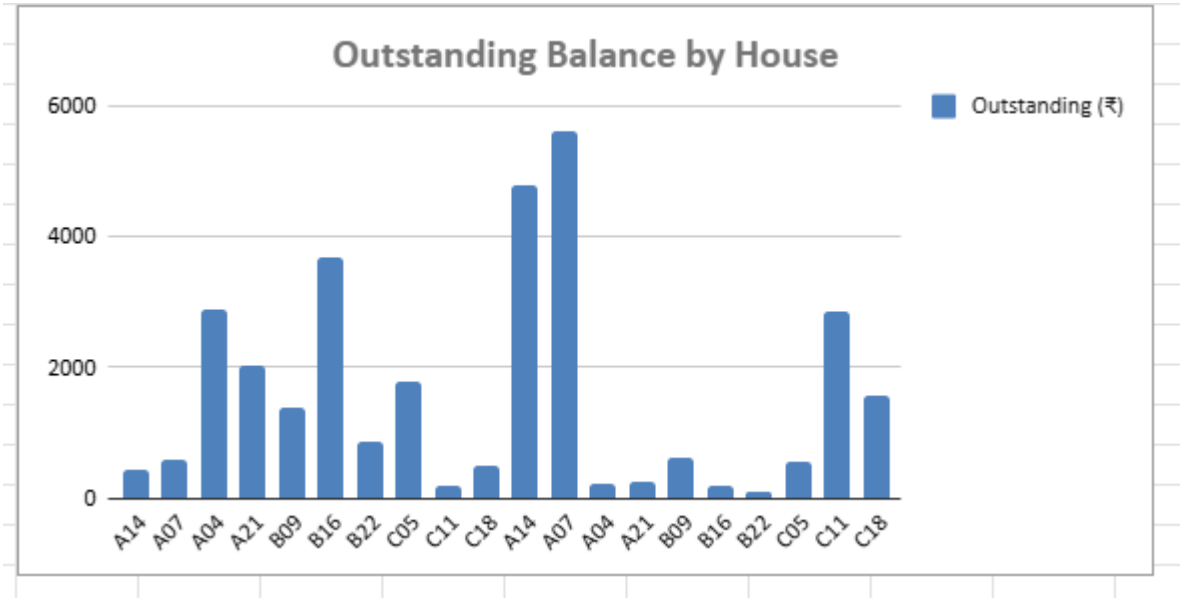
4 Descriptive Statistics



4.1 Total Intake (Purchase) Over Time

Metric	Value (₹)
Count (Days Recorded)	50
Mean (Average Daily Intake)	**8,813.38**
Standard Deviation	**5,145.63**
Minimum	**396.00**
25% (Lower Quartile)	**5,508.50**
Median (50%)	**8,069.00**
75% (Upper Quartile)	**11,547.75**
Maximum	**22,745.00**



4.2 Flat-wise Credit Summary (Monthly)

Metric	Total Credit (₹)	Total Repaid (₹)	Outstanding (₹)
Count (Flats)	20	20	20
Mean	**4,720.10**	**3,165.30**	**1,554.80**
Standard Deviation	**2,876.83**	**2,687.91**	**1,630.85**
Minimum	**546.00**	**27.00**	**108.00**
25%	**2,602.25**	**557.00**	**372.50**
Median (50%)	**5,030.00**	**2,649.50**	**739.00**
75%	**7,218.25**	**5,319.00**	**2,247.25**
Maximum	**8,699.00**	**7,835.00**	**5,627.00**

- Purchase & Sales Records:

The daily sales data that are inclusive of the quantity sold, selling price, purchase price, and item category are the direct means of addressing the first problem statement by showing the financial performance of the business on a daily basis. In this way, profit per item can be very accurately calculated, high and low margin products can be determined, and pricing strategies, stock rotation, and choice of the products that contribute most to revenue and profitability can be made with the support of these data.

- Credit Management:

The monthly credit data per flat that comprise customer name/house number, credit amount issued, repayments, and outstanding balances, respond to the second problem statement by facilitating the monitoring and control of credit utilization that is very effective. Consequently, the store owner is able to set up a well, organized credit policy, recognize the households that delay in repayment, control credit risk, and manage cash flow more efficiently.

5 Detailed Explanation of Analysis Process & Methods

The analysis for this project relied extensively on quantitative and qualitative methods, with each method being chosen specifically to address the operational and financial issues of the store.

Spreadsheet, Based Computation:

Google Sheets and Excel were the main tools for the calculations of daily sales, total intake (purchases), monthly credit summaries, and category, wise performance. The automation of calculations, data aggregation, and consistency were done with the help of functions such as SUM, AVERAGE, VLOOKUP, and IF. Thus, it was possible to efficiently track daily expenditure, revenue, and profit, with the workflow remaining simple and transparent for the business owner.

Time, Series Analysis:

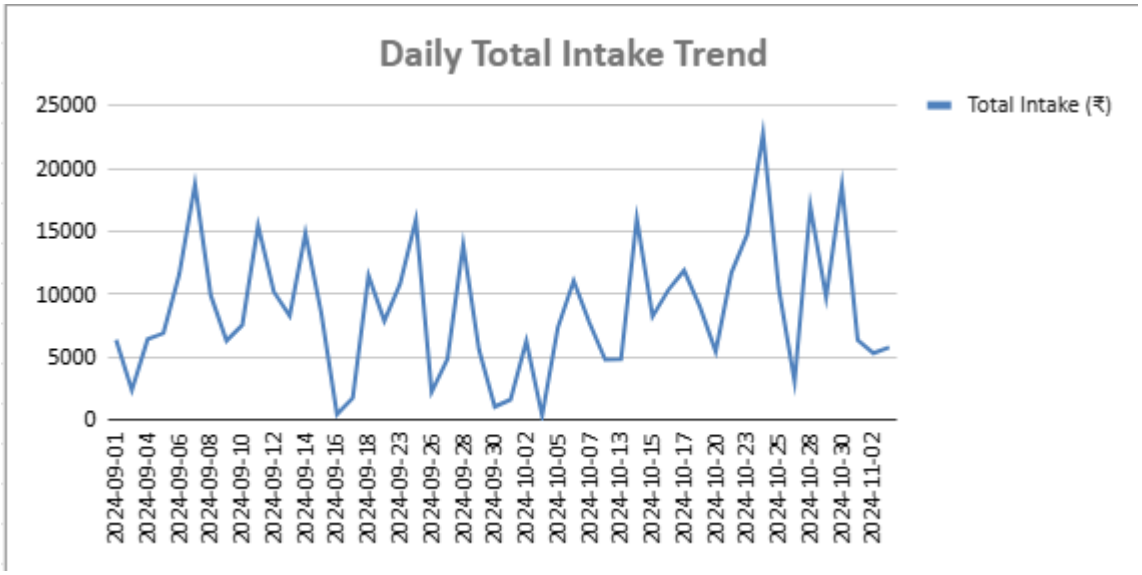
Due to the fact that business transactions are carried out daily, time, series analysis was used to highlight the changes and fluctuations in Sales, Purchase Intake, and Credit Usage during the months chosen. This way, the identification of the periods of peak demand, restocking cycles, maximum credit dependency, and days of high/low profitability was possible. Knowledge of these temporal patterns is an absolute must for pricing decisions, inventory planning, and cash flow management.

Qualitative Discussions with Store Owner:

Interviews with the store owner brought in ideas that even numbers cannot show. These encompassed the logic behind providing credit, customer repayment behaviour, the choice of suppliers, stocking logic, and the pricing flexibility. The involvement of such elements ensured that the conclusions derived from the analysis were not only feasible but also in harmony with the real business constraints.

Results and Findings

6.1 Daily Purchase (Intake) Trend



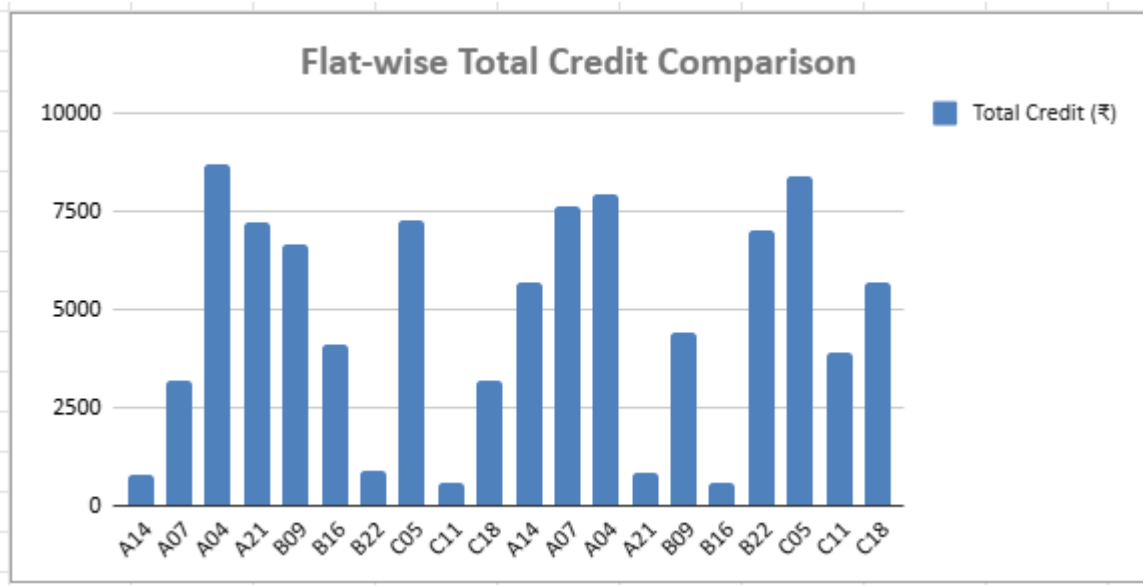
A clear fluctuation can be seen in the daily purchase amounts.
This reflects real-world stocking behavior where purchases increase when inventory runs low and reduce once buffer stock is secured.

From the descriptive statistics:

- **Mean Daily Purchase: ₹ 8,813**
- **Standard Deviation: ₹ 5,145**
- **Minimum Purchase: ₹ 396**
- **Maximum Purchase: ₹ 22,745**

Interpretation:
The high variability indicates that the store follows a **demand-based restocking pattern** rather than fixed ordering cycles. Larger intake days indicate **bulk procurement**, often before weekends or anticipated high customer demand.

6.2 Credit Usage Pattern (Flat-wise Summary)



From the descriptive statistics:

- **Mean Outstanding Per Flat: ₹ 1,554**
- **Median Outstanding Per Flat: ₹ 739**
- **Maximum Outstanding: ₹ 5,627**
- **Minimum Outstanding: ₹ 108**

Interpretation:
A small number of flats hold **higher unpaid balances**, indicating **credit concentration risk**. Most households maintain **low-to-moderate credit levels**, repaying periodically.

6.4 Key Insights

- **Purchases are irregular but purposeful**, indicating the store restocks reactively depending on actual demand and stock levels.
- **Sales patterns are stable**, meaning **core items have consistent demand**.
- **Credit usage varies by household**, with a few houses contributing to the majority of outstanding balances.
- Focusing on **payment follow-ups with 2–3 high-outstanding flats** can significantly improve cash flow.