BUSINESS DATA MANAGEMENT CAPSTONE PROJECT

Optimizing Business Model of a Local Grocery Shop

Name – Om Aryan

Roll no. – 21F3002286

Declaration Statement

I am working on a Project Title **"Optimizing Business Model of a Local Grocery Shop"**. I extend my appreciation to **The Need Shop, Faridabad**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analysed to assure its reliability.

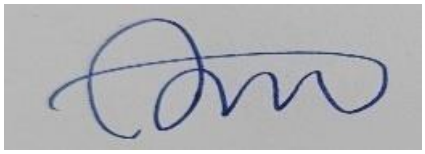
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate:



Name: OM ARYAN

Date: 02-11-2024

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Executive Summary

The project examines the business challenges of The Need Shop, a small grocery shop located in Faridabad, Haryana, which sells basic products of daily needs to the local inhabitants. This has led online delivery and superstore competition to have diverted footfalls and sales, along with the corresponding high-cost distributor sales which limit profit margins, and soaring maintenance and utility bills-that are genuinely a big task to run the operations smoothly.

The analysis incorporated the insights on key metrics such as cost price, selling price, quantity sold, quantity purchased, inventory turnover-via the Excel charts and pivot tables from a data-driven approach. Descriptive statistics and time series analysis explains sales trends and profit impact. It should also be noted that the overall analysis was hence made stronger with manual data cleaning, organization, and visualization, in order to highlight the strong patterns detected in this analysis.

The midterm report also comprises metadata validation, evidence of data authenticity, and photographic evidence to provide a record of the shop's operating environment, as well as a letter from the shop owner confirming support. These enhance the findings from the integrity's perspective. The report also lists the methods of analysis employed and offers a rationale for them to show just how such a process of analysis fits in a pocket-sized business like The Need Shop.

Proposed results should generate well-reasoned methods to raise profitability, hold operational costs to a minimum, and update stock requirements. This research aims to arm the company with data-supported proposals for strengthening its competitive standing, bolstering profitability, and retaining its clientele in the present troubled market.

Proof of Originality of data

Located at Sector 21A, Faridabad, Haryana, The Need Shop is a small grocery shop owned by Mr. Sunil Kumar and started in 2008. The store is located in the middle of a big residential area, in the main HUDA Market of the sector, making them operationally positioned better under the FMCG category. Local residents will have a convenient location for essential household goods and daily necessities nearby. Few of the best-selling products from this shop are Milk & Dairy, Bread, Chocolates and Organic Pulses.

For the purposes of this project, I collected primary data directly from The Need Shop to ensure authentic insights and analyses.

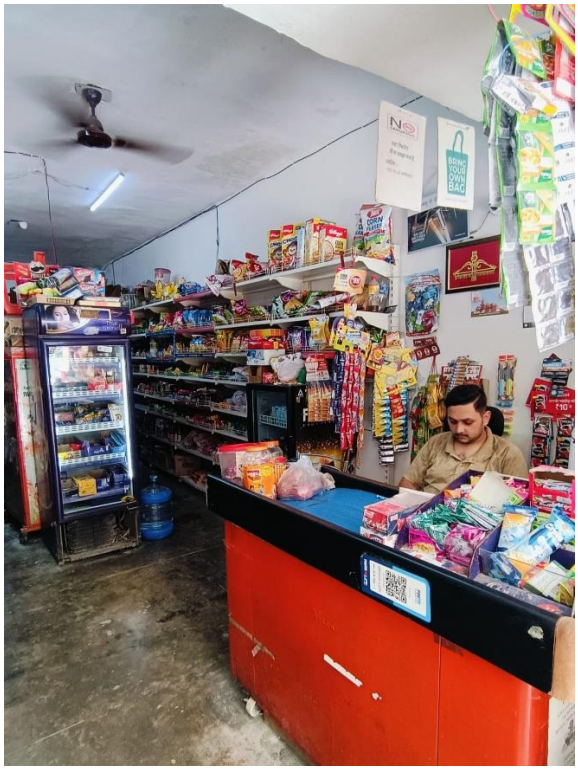


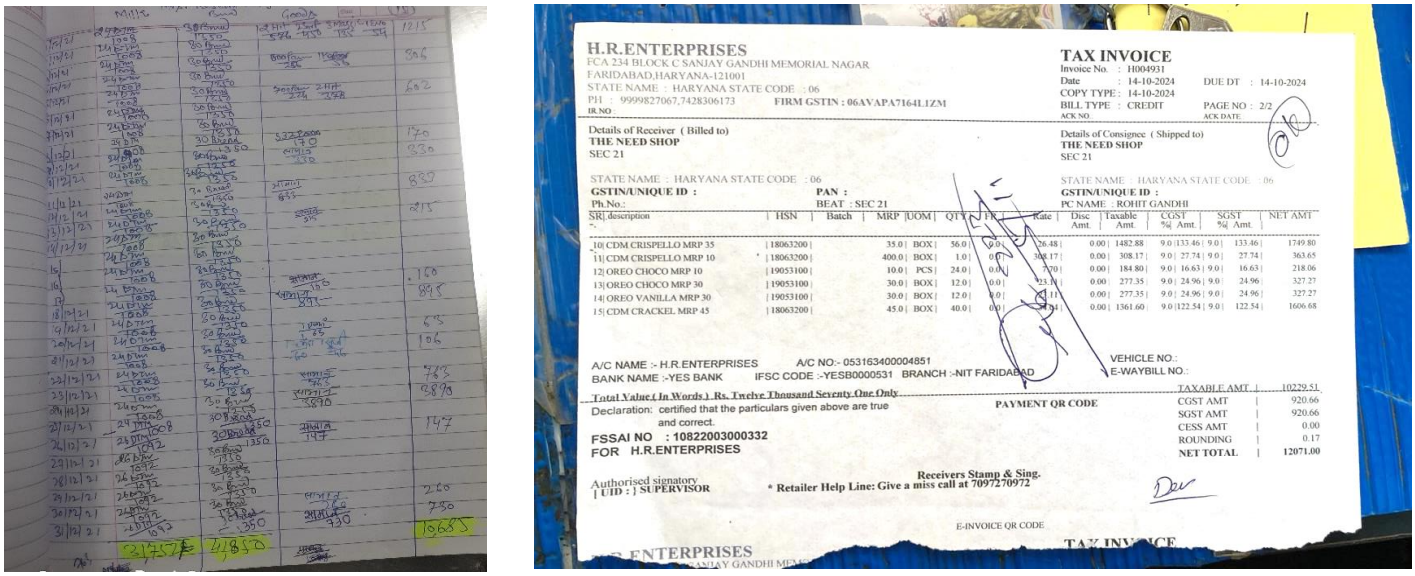
Image (2.1) Shop images and the Locality

Image (2.2) is) A firm handshake with the owner, ii) Selfie with the owner of the shop

- **Short Video of Interaction with the owner: Video Link**
- **Letter head document from the business: Link**
- **More images for credibility: Link**

Metadata

The Need shop runs on mini mart like scale, for its small size and conventional way of operating it store does not have digital record. The sales and purchases are only tracked informally by hand-written logs. In these records I have been provided to do my analysis with some insight of these purchases and sales for my project.



H.R.ENTERPRISES
FCA 234 BLOCK C SANJAY GANDHI MEMORIAL NAGAR
FARIDABAD,HARYANA-121001
STATE NAME : HARYANA STATE CODE : 06
PH : 9999827067,7428306173 FIRM GSTIN : 06AVAPA7164L1ZM

TAX INVOICE
Invoice No. : H004931
Date : 14-10-2024 DUE DT : 14-10-2024
COPY TYPE : 14-10-2024
BILL TYPE : CREDIT PAGE NO : 2/2

Details of Receiver (Billed to)
THE NEED SHOP
SEC 21

Details of Consignee (Shipped to)
THE NEED SHOP
SEC 21

GSTIN/UNIQUE ID :
PAN :
Ph.No.:
BEAT : SEC 21
GSTIN/UNIQUE ID :
PC NAME : ROHIT GANDHI

SR	description	HSN	Batch	MRP	UOM	QTY	FR	Rate	Disc Amt	Taxable Amt	CGST %| Amt	SGST %| Amt	NET AMT
10 CDM CRISPELLO MRP 35	18063200		35.0	BOX	56.0	0.0	26.48	0.00	1482.88	9.0 133.46	9.0	133.46	1749.80
11 CDM CRISPELLO MRP 10	18063200		400.0	BOX	1.0	0.0	308.17	0.00	308.17	9.0 27.74	9.0	27.74	363.65
12 OREO CHOCO MRP 10	19053100		10.0	PCS	24.0	0.0	7.70	0.00	184.80	9.0 16.63	9.0	16.63	218.06
13 OREO CHOCO MRP 30	19053100		30.0	BOX	12.0	0.0	23.11	0.00	277.35	9.0 24.96	9.0	24.96	327.27
14 OREO VANILLA MRP 30	19053100		30.0	BOX	12.0	0.0	23.11	0.00	277.35	9.0 24.96	9.0	24.96	327.27
15 CDM CRACKEL MRP 45	18063200		45.0	BOX	40.0	0.0	34.04	0.00	1361.60	9.0 122.54	9.0	122.54	1606.68

A/C NAME :- H.R.ENTERPRISES A/C NO.:- 053163400004851
BANK NAME :-YES BANK IFSC CODE :-YESB0000531 BRANCH :-NIT FARIDABAD
VEHICLE NO.:
E-WAYBILL NO.:

Total Value (In Words) Rs. Twelve Thousand Seventy One Only

TAXABLE AMT	10229.51
CGST AMT	920.66
SGST AMT	920.66
CESS AMT	0.00
ROUNDING	0.17
NET TOTAL	12071.00

Declaration: certified that the particulars given above are true and correct.
PAYMENT QR CODE
FSSAI NO : 10822003000332
FOR H.R.ENTERPRISES
Authorised signatory
[UID :] SUPERVISOR
Receivers Stamp & Sing.
* Retailer Help Line: Give a miss call at 7097270972
E-INVOICE QR CODE

Image (3.1) Informal Sales and Purchase logs provided by the business

We are focusing on 10 SKUs that contribute the most to their income generation for the analysis. These include:

- Milk & Dairy
- Bread
- Chocolates
- Cigarettes
- Eggs
- Atta
- Organic Pulses
- Beverages
- Snacks and Biscuits
- Chips and Wafers

This data is stored in 3 worksheets- **Sales Data, Inventory Data and Purchase Data** that captures details of sales, inventory levels as well as product bought to fill the gap between stock sold – purchase cycle thus giving a holistic view on how the shop is performing.

- **Sales Data:** The Sales data includes the following tables:
  - Sold Quantity: Quantity of each SKU sold across 12 weeks.
  - Sold Amount: Total revenue generated for each SKU over the 12 weeks.
  - Selling Price: Selling price for each SKU during the 12-week period.

Sold Quantity

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total Sold Quantity
Milk & Dairy	1004	996	1071	985	1007	990	1009	1004	1010	985	998	1010	12169
Bread	485	485	497	475	433	507	490	490	460	515	469	485	5791
Chocolates	48	49	42	40	69	77	65	54	36	48	40	38	606
Cigarettes	412	395	320	494	421	455	360	390	429	376	382	387	4811
Eggs	285	290	305	296	300	315	306	310	305	290	302	286	3560
Atta	49	15	20	54	10	25	63	15	30	30	44	49	404
Organic Pulses	13	9	12	15	16	7	9	10	14	12	20	4	141
Beverages	79	79	74	94	66	79	59	70	74	59	79	64	874
Snacks and Biscuits	33	33	30	30	25	47	42	43	24	33	32	28	400
Chips and Wafers	146	121	171	126	145	149	159	121	112	160	172	141	1753
Total Sold Quantity (Weekly)	2554	2482	2542	2599	2492	2651	2672	2517	2494	2477	2537	2492	30509

Selling Price (per unit)

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Average Selling Price
Milk & Dairy	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 61.00	₹ 61.00	₹ 60.17
Bread	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00	₹ 50.00
Chocolates	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00	₹ 65.00
Cigarettes	₹ 15.00	₹ 15.00	₹ 15.00	₹ 15.00	₹ 15.00	₹ 15.00	₹ 15.00	₹ 16.00	₹ 16.00	₹ 16.00	₹ 16.00	₹ 16.00	₹ 15.42
Eggs	₹ 10.00	₹ 10.00	₹ 9.00	₹ 9.00	₹ 10.00	₹ 10.00	₹ 10.00	₹ 9.00	₹ 9.00	₹ 9.00	₹ 9.00	₹ 9.00	₹ 9.42
Atta	₹ 330.00	₹ 330.00	₹ 330.00	₹ 335.00	₹ 330.00	₹ 330.00	₹ 330.00	₹ 330.00	₹ 340.00	₹ 340.00	₹ 340.00	₹ 340.00	₹ 334.58
Organic Pulses	₹ 210.00	₹ 210.00	₹ 210.00	₹ 215.00	₹ 220.00	₹ 220.00	₹ 210.00	₹ 210.00	₹ 210.00	₹ 220.00	₹ 220.00	₹ 220.00	₹ 214.58
Beverages	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00	₹ 40.00
Snacks and Biscuits	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00	₹ 30.00
Chips and Wafers	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00	₹ 20.00

Sales Amount

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total Sales
Milk & Dairy	₹ 60,240.00	₹ 59,760.00	₹ 64,260.00	₹ 59,100.00	₹ 60,420.00	₹ 59,400.00	₹ 66,540.00	₹ 60,240.00	₹ 60,600.00	₹ 59,100.00	₹ 60,878.00	₹ 61,610.00	₹ 7,32,148.00
Bread	₹ 24,250.00	₹ 24,250.00	₹ 24,850.00	₹ 23,750.00	₹ 21,650.00	₹ 25,350.00	₹ 24,500.00	₹ 24,500.00	₹ 23,000.00	₹ 25,750.00	₹ 23,450.00	₹ 24,250.00	₹ 2,89,550.00
Chocolates	₹ 3,120.00	₹ 3,185.00	₹ 2,730.00	₹ 2,600.00	₹ 4,485.00	₹ 5,005.00	₹ 4,225.00	₹ 3,510.00	₹ 2,340.00	₹ 3,120.00	₹ 2,600.00	₹ 2,470.00	₹ 39,390.00
Cigarettes	₹ 6,180.00	₹ 5,925.00	₹ 4,800.00	₹ 7,260.00	₹ 6,315.00	₹ 6,825.00	₹ 5,400.00	₹ 6,240.00	₹ 6,864.00	₹ 6,016.00	₹ 6,112.00	₹ 6,192.00	₹ 74,129.00
Eggs	₹ 2,850.00	₹ 2,900.00	₹ 2,745.00	₹ 2,664.00	₹ 3,000.00	₹ 3,150.00	₹ 3,060.00	₹ 2,790.00	₹ 2,745.00	₹ 2,340.00	₹ 2,718.00	₹ 2,574.00	₹ 33,536.00
Atta	₹ 16,170.00	₹ 4,950.00	₹ 6,600.00	₹ 18,090.00	₹ 3,300.00	₹ 8,250.00	₹ 20,790.00	₹ 5,100.00	₹ 10,200.00	₹ 10,200.00	₹ 14,960.00	₹ 16,660.00	₹ 1,35,270.00
Organic Pulses	₹ 2,730.00	₹ 1,890.00	₹ 2,520.00	₹ 3,225.00	₹ 3,520.00	₹ 1,540.00	₹ 1,890.00	₹ 2,100.00	₹ 2,940.00	₹ 2,640.00	₹ 4,400.00	₹ 880.00	₹ 30,275.00
Beverages	₹ 3,160.00	₹ 3,160.00	₹ 2,960.00	₹ 3,760.00	₹ 2,640.00	₹ 3,160.00	₹ 2,360.00	₹ 2,800.00	₹ 2,960.00	₹ 2,320.00	₹ 3,120.00	₹ 2,560.00	₹ 34,960.00
Snacks and Biscuits	₹ 990.00	₹ 990.00	₹ 900.00	₹ 900.00	₹ 750.00	₹ 1,410.00	₹ 1,260.00	₹ 1,290.00	₹ 720.00	₹ 990.00	₹ 960.00	₹ 840.00	₹ 12,000.00
Chips and Wafers	₹ 2,920.00	₹ 2,620.00	₹ 3,420.00	₹ 2,520.00	₹ 2,900.00	₹ 2,980.00	₹ 3,180.00	₹ 2,620.00	₹ 2,240.00	₹ 3,200.00	₹ 3,440.00	₹ 2,820.00	₹ 35,060.00
Total Sales	₹ 1,22,610.00	₹ 1,09,630.00	₹ 1,15,785.00	₹ 1,23,863.00	₹ 1,08,980.00	₹ 1,17,070.00	₹ 1,33,405.00	₹ 1,11,190.00	₹ 1,14,609.00	₹ 1,15,676.00	₹ 1,22,638.00	₹ 1,20,856.00	₹ 14,16,318.00
Monthly Sales		₹ 4,71,894.00				₹ 4,70,645.00				₹ 4,73,779.00			

Image (3.2) Representation of Sales Data

- **Purchases Data:** The Purchases data includes the following tables:

  - Purchased Quantity: Quantity of each SKU purchased across 12 weeks.

  - Purchased Amount: Total cost incurred for purchasing each SKU during 12 weeks.

  - Cost Price: Cost price for each SKU during the 12-week period.

Purchase Quantity

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total Purchased Quantity
Milk & Dairy	1010	1000	1080	995	1000	980	1100	1010	1005	990	1000	1020	12190
Bread	490	490	500	475	430	510	480	495	470	500	475	490	5805
Chocolates	50	50	45	40	70	75	65	50	40	50	35	40	610
Cigarettes	420	390	330	470	425	460	360	395	415	380	380	400	4825
Eggs	300	280	285	290	285	320	300	290	320	280	280	275	3545
Atta	50	15	20	55	10	25	60	15	30	30	45	50	405
Organic Pulses	15	5	15	15	15	5	10	10	15	10	20	5	140
Beverages	80	80	75	95	65	80	60	70	75	60	70	65	875
Snacks and Biscuits	35	35	30	25	25	50	45	45	25	30	30	25	400
Chips and Wafers	150	135	160	130	145	145	170	135	125	145	170	145	1755
Total Purchased Quantity (Weekly)	2600	2480	2540	2610	2470	2650	2650	2535	2520	2475	2505	2515	30550

Cost Price (per unit)

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Average Cost Price
Milk & Dairy	₹ 59.00	₹ 59.00	₹ 59.00	₹ 59.00	₹ 59.00	₹ 59.50	₹ 59.50	₹ 59.50	₹ 59.50	₹ 59.50	₹ 60.00	₹ 60.00	₹ 59.38
Bread	₹ 46.00	₹ 46.00	₹ 46.00	₹ 46.00	₹ 46.00	₹ 46.00	₹ 47.00	₹ 47.00	₹ 47.00	₹ 47.00	₹ 47.00	₹ 47.00	₹ 46.50
Chocolates	₹ 58.00	₹ 58.00	₹ 58.50	₹ 58.50	₹ 58.50	₹ 58.50	₹ 58.50	₹ 60.00	₹ 60.00	₹ 60.00	₹ 60.00	₹ 61.00	₹ 59.13
Cigarettes	₹ 13.00	₹ 13.00	₹ 13.00	₹ 13.00	₹ 13.00	₹ 14.00	₹ 14.00	₹ 14.00	₹ 15.00	₹ 15.00	₹ 15.50	₹ 15.50	₹ 14.00
Eggs	₹ 8.00	₹ 8.00	₹ 7.50	₹ 7.50	₹ 8.00	₹ 8.50	₹ 8.00	₹ 7.00	₹ 7.00	₹ 7.00	₹ 7.50	₹ 8.00	₹ 7.67
Atta	₹ 280.00	₹ 280.00	₹ 280.00	₹ 285.00	₹ 280.00	₹ 290.00	₹ 290.00	₹ 300.00	₹ 300.00	₹ 300.00	₹ 310.00	₹ 310.00	₹ 294.58
Organic Pulses	₹ 170.00	₹ 170.00	₹ 170.00	₹ 190.00	₹ 190.00	₹ 190.00	₹ 185.00	₹ 185.00	₹ 185.00	₹ 190.00	₹ 190.00	₹ 190.00	₹ 183.75
Beverages	₹ 38.00	₹ 38.00	₹ 38.00	₹ 38.00	₹ 39.00	₹ 38.00	₹ 38.00	₹ 39.00	₹ 39.00	₹ 39.00	₹ 39.00	₹ 39.00	₹ 38.67
Snacks and Biscuits	₹ 28.00	₹ 28.00	₹ 28.00	₹ 28.00	₹ 28.00	₹ 29.00	₹ 29.00	₹ 29.50	₹ 29.50	₹ 29.50	₹ 29.50	₹ 29.50	₹ 28.79
Chips and Wafers	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.00	₹ 18.50	₹ 18.50	₹ 18.08

Purchase Amount

SKUs	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	Total Expenditure
Milk & Dairy	₹ 59,590.00	₹ 59,000.00	₹ 63,720.00	₹ 58,705.00	₹ 59,000.00	₹ 58,310.00	₹ 65,450.00	₹ 60,095.00	₹ 59,797.50	₹ 58,905.00	₹ 60,000.00	₹ 61,200.00	₹ 7,23,772.50
Bread	₹ 22,540.00	₹ 22,540.00	₹ 23,000.00	₹ 21,850.00	₹ 19,780.00	₹ 23,460.00	₹ 22,560.00	₹ 23,265.00	₹ 22,090.00	₹ 23,500.00	₹ 22,325.00	₹ 23,030.00	₹ 2,69,940.00
Chocolates	₹ 2,900.00	₹ 2,900.00	₹ 2,632.50	₹ 2,340.00	₹ 4,095.00	₹ 4,387.50	₹ 3,802.50	₹ 3,000.00	₹ 2,400.00	₹ 3,000.00	₹ 2,100.00	₹ 2,440.00	₹ 35,997.50
Cigarettes	₹ 5,460.00	₹ 5,070.00	₹ 4,290.00	₹ 6,110.00	₹ 5,525.00	₹ 6,440.00	₹ 5,040.00	₹ 5,530.00	₹ 6,225.00	₹ 5,700.00	₹ 5,890.00	₹ 6,200.00	₹ 67,480.00
Eggs	₹ 2,400.00	₹ 2,240.00	₹ 2,137.50	₹ 2,025.00	₹ 2,280.00	₹ 2,720.00	₹ 2,400.00	₹ 2,170.00	₹ 2,240.00	₹ 1,960.00	₹ 2,100.00	₹ 2,200.00	₹ 27,172.50
Atta	₹ 14,000.00	₹ 4,200.00	₹ 5,600.00	₹ 16,225.00	₹ 2,800.00	₹ 7,250.00	₹ 17,400.00	₹ 4,500.00	₹ 9,000.00	₹ 9,000.00	₹ 13,950.00	₹ 15,500.00	₹ 1,19,725.00
Organic Pulses	₹ 2,550.00	₹ 850.00	₹ 2,550.00	₹ 2,850.00	₹ 2,850.00	₹ 950.00	₹ 1,650.00	₹ 1,850.00	₹ 2,775.00	₹ 1,900.00	₹ 3,800.00	₹ 950.00	₹ 25,725.00
Beverages	₹ 3,040.00	₹ 3,040.00	₹ 2,850.00	₹ 3,610.00	₹ 2,535.00	₹ 3,120.00	₹ 2,340.00	₹ 2,730.00	₹ 2,925.00	₹ 2,340.00	₹ 2,730.00	₹ 2,535.00	₹ 33,795.00
Snacks and Biscuits	₹ 980.00	₹ 980.00	₹ 840.00	₹ 700.00	₹ 700.00	₹ 1,450.00	₹ 1,305.00	₹ 1,507.50	₹ 787.50	₹ 885.00	₹ 885.00	₹ 787.50	₹ 11,827.50
Chips and Wafers	₹ 2,700.00	₹ 2,430.00	₹ 2,880.00	₹ 2,340.00	₹ 2,610.00	₹ 2,610.00	₹ 3,060.00	₹ 2,430.00	₹ 2,250.00	₹ 2,610.00	₹ 3,145.00	₹ 2,662.50	₹ 31,747.50
Total Expenditure	₹ 1,16,160.00	₹ 1,03,250.00	₹ 1,10,700.00	₹ 1,17,095.00	₹ 1,02,275.00	₹ 1,10,697.50	₹ 1,25,207.50	₹ 1,06,897.50	₹ 1,10,440.00	₹ 1,09,800.00	₹ 1,16,325.00	₹ 1,17,475.00	₹ 10,46,882.50
Monthly Expenditure		₹ 4,47,165.00				₹ 4,45,077.50				₹ 4,54,640.00			

Image (3.3) Representation of Purchases Data

- **Inventory Data:** It contains a table with SKUs as columns and weeks as rows, displaying the inventory levels for each SKU over the 12-weeks period.

Inventory											
WEEK	Milk	Bread	Chocolates	Cigarettes	Eggs	Atta	Pulses	Beverages	Snacks and Biscuits	Chips and Wafers	Total Inventory
Week 1	3	2	2	12	32	2	4	1	3	7	68
Week 2	7	7	3	7	22	2	0	2	5	11	66
Week 3	16	10	6	17	2	2	3	3	5	0	64
Week 4	26	10	6	3	16	3	3	4	0	4	75
Week 5	19	7	7	7	1	3	2	3	0	4	53
Week 6	9	10	5	12	6	3	0	4	3	0	52
Week 7	0	0	5	12	0	0	1	5	6	1	30
Week 8	6	5	1	17	0	0	1	5	8	5	48
Week 9	1	15	5	3	15	0	2	6	9	18	74
Week 10	6	0	7	7	35	0	0	8	6	3	72
Week 11	8	6	2	5	13	1	0	0	4	1	40
Week 12	18	11	4	18	2	2	1	1	1	5	63
Average Inventory	9.92	6.92	4.42	10	12	1.5	1.42	3.5	4.17	4.92	

Image (3.4) Representation of Inventory Data

- **Link to project data: Data Link**

Descriptive Statistics

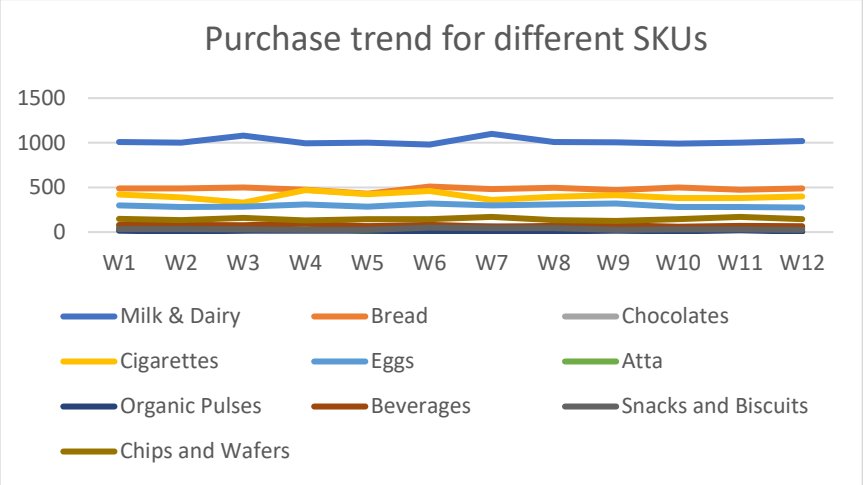


Chart (4.1) Purchase Trend for different products

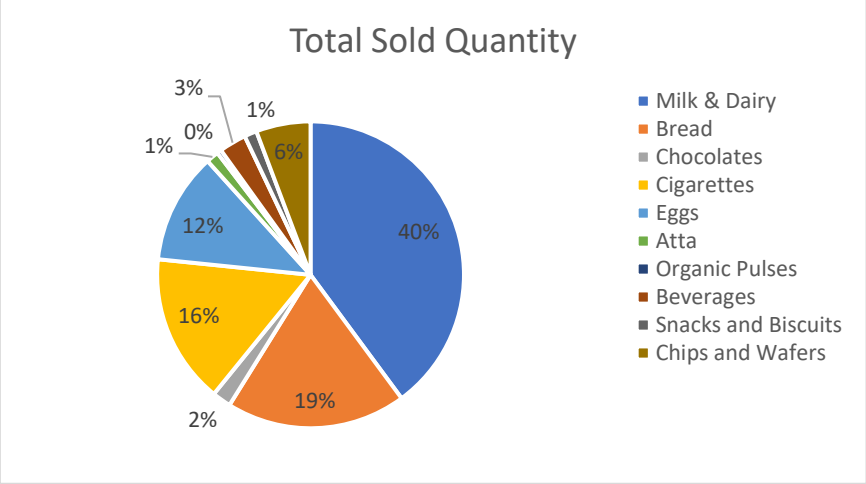


Chart (4.2) Distribution of SKUs over Sold Quantity

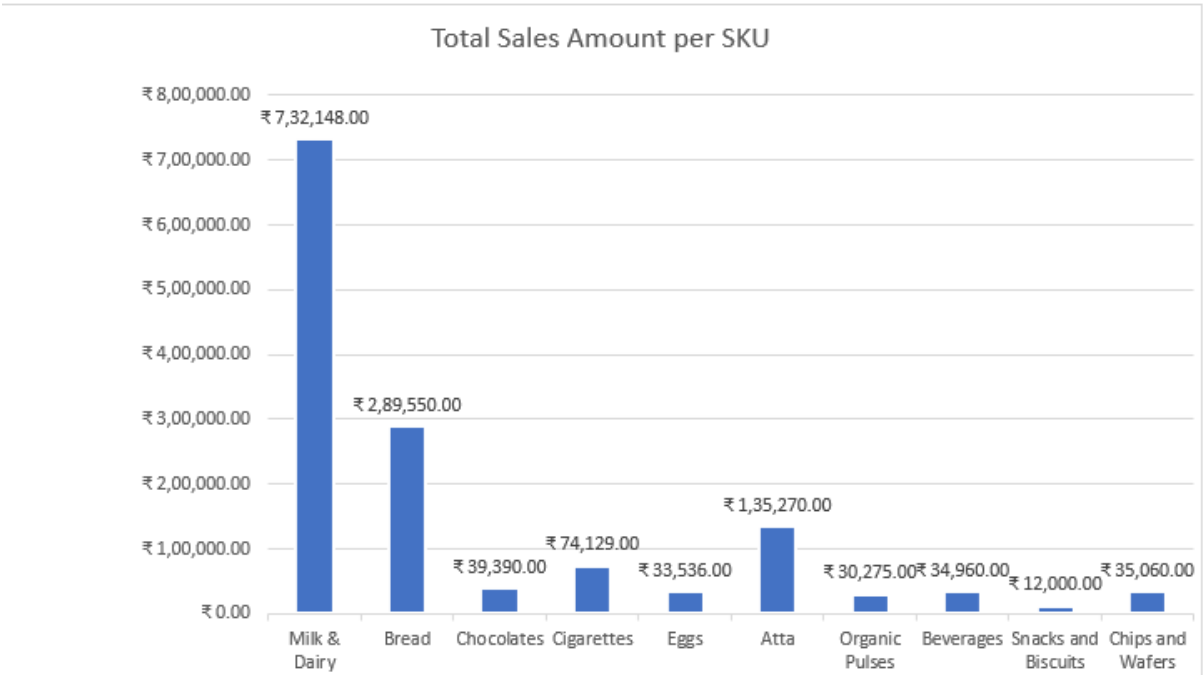


Chart (4.3) Total Sales Amount per SKU

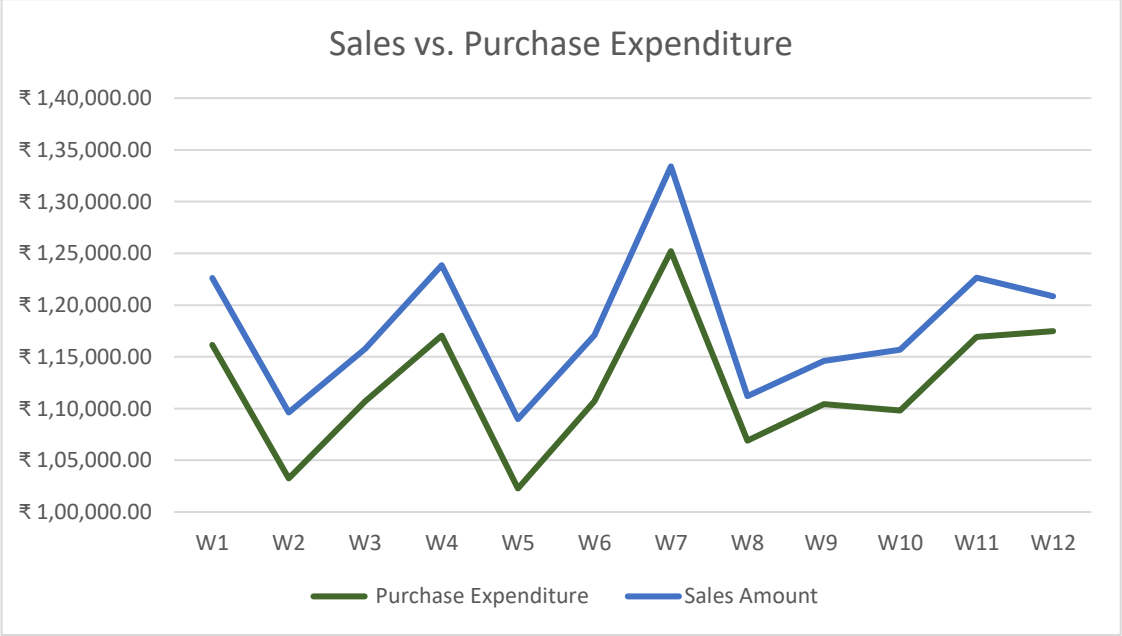


Chart (4.4) Sales Amount VS Purchase Expenditure across 12 weeks

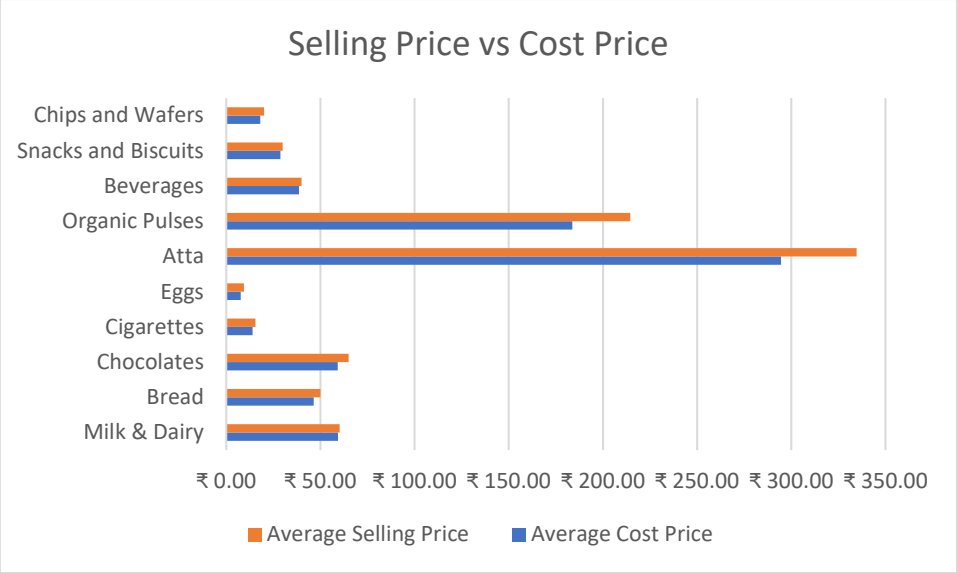


Chart (4.5) Average Selling Price vs Average Cost Price

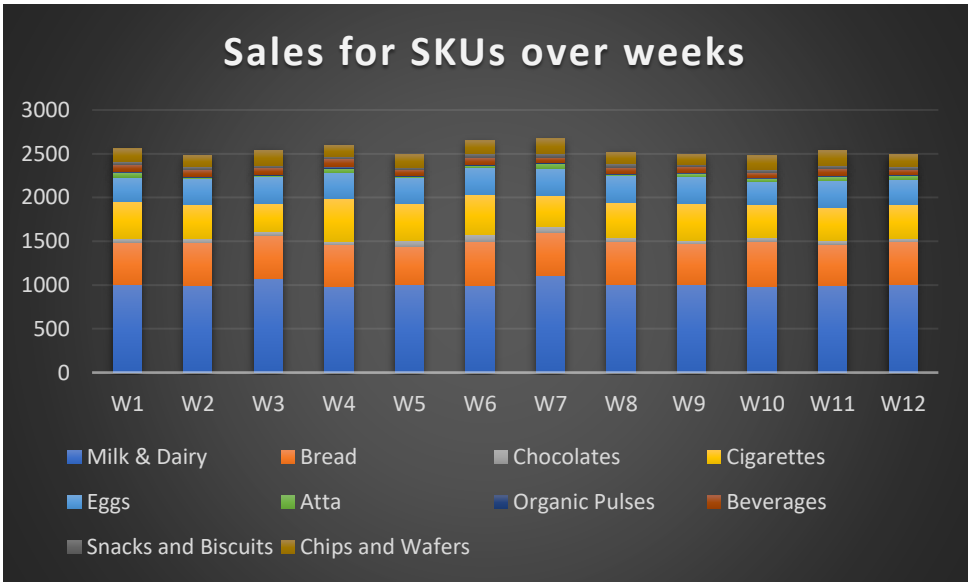


Chart (4.6) Sales for different SKUs over 12 weeks period

Detailed Explanation of Analysis Process/Method

1. **Data Collection and Preparation:**

   In the process of Data Collection, I explored various local businesses, however, most of them were reluctant to provide me with their records, The Need Shop however, was kind enough to make the relevant information available.

   The primary data collection process developed by engaging the owner of the business in simple dialogues in order to observe, record, and define the record-keeping practices

in use, business model, business challenges, and the proposed or implement actions to address those challenges. This conversation, shown in Image (2.2), helped me understand the company's operational framework in brief along with its customer base. This paved the way for the understanding of the purchasing and selling behaviour of the business in an in-depth manner. The business owner provided me with the data of Sales and Purchase for 12 weeks period in informal/handwritten logs (Image 3.1). Presently, this handwritten information is transformed into structured format in excel consisting of digital sheets manually for the purpose of enabling further analysis and interpretation of the information.

2. **Objective:** The analysis is directed at helping the grocery store with its basic operational tasks, more so concerning replenishment and sales management. Thus, analysing the shop's purchases and sales and levels of stock, the research sought to identify weekly demand patterns, trends in levels of stock, and levels of profitability for each item. The analysis reveals to the shop, how to stock the items more efficiently, gives ways of cost management through pricing, and provides how to price items for better returns, in turn providing the business direction.

3. **Analysis Techniques used:** In this analysis, I employed a combination of techniques based on Excel in order to extract knowledge from the data in an efficient manner for this analysis. Firstly, in order to summarize and organize the large amounts of information contained in the database, Pivot Tables were employed to help in the quick aggregation and filtration of data by SKU, time intervals measured weekly, and the values of purchases and sales. Pivot Tables gave a more categorical glance of the main trends occurring on the shop transactions and inventory flow. To have an in-depth analysis, I employed Descriptive Statistics to compute fundamental statistical measures such as Mean, standard deviation & range etc. This aided in understanding of the mean and spread on weekly sales, purchases, and inventory levels per SKU. Furthermore, I created different charts and visualizations using Excel available chart functions. Line charts, bar charts and stacked column charts were among these visuals that helped to represent change over time, comparison of sales and spend along with SKU performance. Collected, these techniques offered a full picture of the shop performance data, providing actionable insights to drive inventory optimization while maximizing profitability.

4. **Visualization and Reporting:** Employed Excel charting tools to develop visually appealing and easy-to-understand graphs that illustrated specific points in the data. For instance, a Weekly Sales Amount vs Purchase Expenditure chart (4.4) indicates the Profitability trend over time. Pricing Strategies (Maximize profit margins) used Chart 4.5 (Average Selling Price Vs Average Cost Price Graph), which is a sales price status report; it helps in identification of component to identify pricing strategy for maximizing the profits. Chart (4.6) follows sales trends for various SKUs within the period of 12 weeks, helping us find out how much demand we found for our product: and Chart (4.2) helps us to distribute them based on sold quantity so that we may know which item is popular among others. The Charts made it simple to interpret complicated data, enabling the shop to make informed decisions and increase visibility into its workings.

Results and Findings

The analysis of the grocery shop's data provided valuable insights across various aspects of the business, from inventory management to sales patterns and profitability. Each chart presented key trends that support informed decision-making and highlight areas for operational improvement. Below are the specific findings from each visualization:

Chart (4.1): Purchase Trend for Different Products

- **Finding**: The purchase trend peaks for *Milk and Dairy* products, which saw the highest value in week 7 (W7), followed closely by *Bread*. This suggests high demand and a consistent need for restocking these staples.

Chart (4.2): Distribution of SKUs Over Sold Quantity

- **Finding**: In terms of volumes sold Milk and Dairy products are leading within the firm's offerings at 40 % of total sales. This is followed by Bread, Cigarettes, and Eggs emphasising the popularity of these products amongst consumers.

Chart (4.3): Total Sales Amount per SKU

- **Finding**: Milk and Dairy products top the total sales amount while Bread and Atta come afterwards. Notably, although Atta contributes only 1% in terms of total quantity sold, it comes third in terms of revenue contribution that is due to a higher selling price per unit.

Chart (4.4): Sales Amount vs. Purchase Expenditure Across 12 Weeks

- **Finding**: In the seventh week (W7), average cost prices as well as average selling prices were highest while in the fifth week (W5), they were lowest. These extremes give an indication of the periodicity of changes in demand and help in forecasting demand during the peak sales periods.

Chart (4.5): Average Selling Price vs. Average Cost Price

- **Finding**: Atta is the highest grossing item on the SKU attended to, Organic Pulses being the second. They however appear to hold low positions in the purchase and sales graphs of the given periods and therefore can be said to be high margin sale items with low market penetration.

Chart (4.6): Sales for Different SKUs Over 12 Weeks

- **Finding**: Weeks 6 (W6) and 7 (W7) are remarkable in that they have higher sales figures with emphasis on movement of various other SKUs. Such trend analysis will assist in stock planning in order for the companies to be able to satisfy customers during the peak sales periods.

Summary: The findings of the research indicated that Milk and Dairy products are the most bought SKU which accounted for 40% of the total sales quantity, followed by Bread which is also always available. What is more surprising is that Atta accounts for merely 1% of the sales quantity yet comes third in the revenue due to its high price, making it a key item for profitability. More sales were recorded in weeks 6 and 7 while week 5 had the least. Furthermore, high margin products such as Atta and Organic Pulses all offer lucrative opportunities sensibly despite having less demand. This implies that there is need to do stock planning in a focused manner towards the periods associated with high sales levels especially for high sales and high profit products. The analysis further reveals that there is no need to hold an excessive quantity of low demand products since all excesses translate to unnecessary costing and management of stock control. This way, there is avoided stock surplus, cash flow improved, stock levels are optimal and there are no stock out situations which enhance the use of resources, improve customer service and grow the business revenue consistently.